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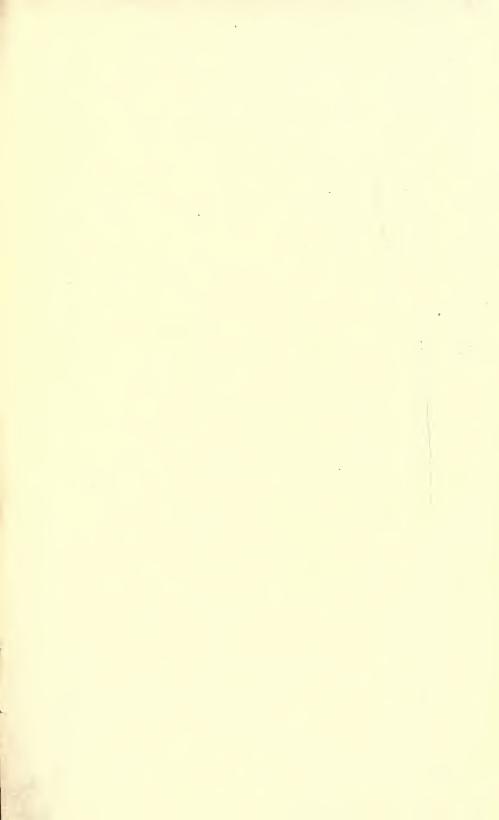
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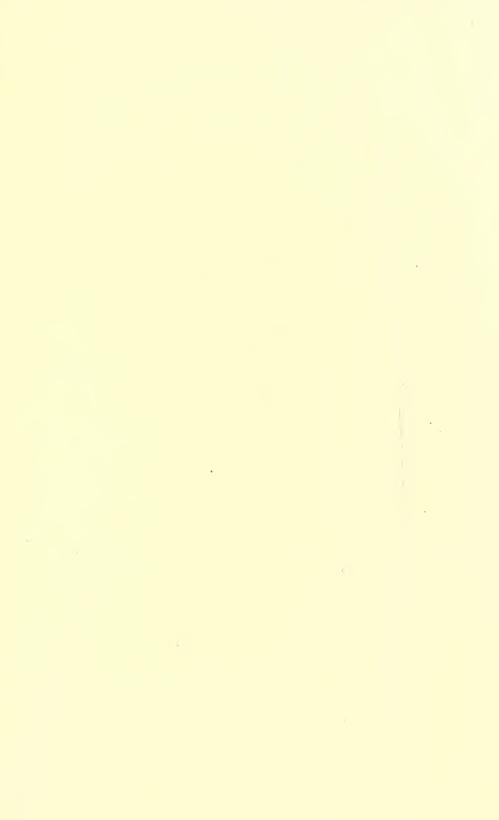
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BROOKS LOCOMOTIVE WORKS,

A CATALOGUE . . .

DESCRIPTIVE OF

SIMPLE AND COMPOUND

· · OCOMOTIVES

BUILT BY

Brooks Locomotive Works,

DUNKIRK, N. Y.,

ANNUAL CAPACITY, 400.

OFFICERS:

FREDERICK H. STEVENS,

ROBERT J. GROSS,

VICE-PRESIDENT.

M. L. HINMAN,

TREASURER.

T.M. HEQUEMBOURG, SECRETARY.

OF IAS MCNAUGH

GHTON,

D. RUSSELL,

GEN'L SUPERINTENDENT.

1899.

CABLE ADDRESS, "BROOKS-DUNKIRK."

75625 BT

TO THE

RAILWAY OFFICIALS OF ALL COUNTRIES,

BY WHOSE COMMANDING GENIUS

THE DESERT HAS BEEN MADE TO BLOOM AND WHOSE LABORS HAVE TRANSFORMED THE EARTH INTO ONE BROAD HIGHWAY OF COMMERCE;

AND TO THE

MEN AT THE THROTTLE,

UPON WHOSE

COURAGE, FIDELITY AND INTELLIGENCE
DEPENDS THE SAFE AND SUCCESSFUL OPERATION
OF LOCOMOTIVES,

HOWEVER PERFECTLY CONSTRUCTED,

THIS BOOK
IS RESPECTFULLY DEDICATED.



INTRODUCTORY.

In THE compilation of this new edition of our catalogue we have sought to bring together, in brief but comprehensive form, such illustrated and statistical information relating to the various types, construction and performance of "Brooks" locomotives as will render it deserving of the attention and consideration of all persons interested in the subject of motive power for railroads. It embodies much that is descriptive of the marked advance in locomotive construction and design which has obtained in the closing years of the century, and it aims to give such accurate data as will enable intending purchasers to arrive at an approximate understanding of their needs.

In the construction of our locomotives we employ only the highest grade of material and workmanship, and all the various details are accurately finished to standard gauges and templets, enabling us to guarantee their interchangeability on all locomotives of the same class.

We have special facilities for furnishing locomotive boilers, tanks and cylinders, and are prepared to furnish duplicate parts of any of our locomotives upon short notice.

Especial attention is invited to the "Brooks Improved Piston Valve," which is now in successful use on many of the engines of important trunk lines. The efficiency and economy which this form of valve has developed by reason of its simplicity and perfect balance bids fair to result in its superseding, to a great extent, the plain valve and the more complicated and expensive compound types. We submit it, with full confidence, to the thoughtful consideration of railway officials and engineers.

The increasing demand for heavier power has required the addition of adequate appliances and machinery for its construction. In this direction we have spared neither effort nor expense, and our shops are now equipped with the latest and most powerful machinery obtainable. Within the last two years there has been added to the

plant a commodious erecting shop, and the boiler and hammer shops have been reconstructed and greatly enlarged. A large percentage of the machinery in the works is operated by electric power, and the shops are amply equipped with powerful electric cranes, pneumatic hoists and tools, hydraulic flanging press, etc.

In thus enlarging our capacity for the manufacture of locomotives we have not lost sight of the increasing service required of them. While pursuing a conservative policy we have designed our engines along bold lines and in keeping with modern ideas and practice, and are fully prepared to submit proposals for locomotives of the most recent and approved types, suitable for any required service, and constructed either from our own designs and specifications or in accordance with those of railway companies.

We have ample facilities for supplying locomotives based upon foreign specifications if within the limits of American practice. This applies to both single expansion and compound types, and contemplates the use of copper fireboxes, brass tubes, screw couplings, etc., as desired.

All material and workmanship entering into the construction of our locomotives is rigidly inspected by competent engineers. The engines are, in all cases, fully erected and tested in running order on our own tracks, and, if for transport to a foreign country, are taken apart and securely packed for sea shipment.

We invite the correspondence of railway officials and of others who may contemplate the purchase of locomotives, and request that, in writing for proposals, full particulars be furnished as to gauge of road, maximum curvature, grades, weight of rail, fuel to be used and the kind of service required.

A cipher code will be found on the last pages of the catalogue for convenience in telegraphing.

Other codes used by us include "Atlantic," "Western Union," "A. B. C., Fourth Edition," "Lieber's," and "Manufacturers' Export."

BROOKS LOCOMOTIVE WORKS.

DUNKIRK, N. Y., December 1, 1899.

A BRIEF HISTORY AND DESCRIPTION OF THE WORKS.



HORATIO G. BROOKS,
Founder of the Works.

A BRIEF HISTORY AND DESCRIPTION OF THE WORKS.

HORATIO G. BROOKS, founder of the BROOKS LOCOMOTIVE WORKS, was born on the 30th day of October, 1828, in the old historic city of Portsmouth, Sprung from that sturdy New England stock whose brain and brawn have left their deep impress upon the history of the century now closing, he, early in life, developed those marked traits which in later years made him a force in the affairs of his day and age. At 14 he passed his leisure hours on and about the engines of the Boston & Maine Railroad, and at 16, after much importunity, his parents yielded to his strong desire to learn the trade of a machinist, and placed him, as an apprentice, in the works of his cousins, Messrs. Isaac & Seth Adams, manufacturers of printing presses. Not finding this congenial, two years later he entered the shops of the Boston & Maine Railroad, at Andover, Mass. He became a close student of all that bore on the line of his work, and was tireless in acquiring all the knowledge then attainable concerning the construction and operation of locomotives. In order to extend his experience in this direction, he left the shops in 1848 and became a fireman on the Boston & Maine, and so valuable were the services he rendered in that capacity that a year later he was promoted to the position of engineer. Thus, at the early age of 21 he had made substantial progress along lines which later enabled him to put in successful play that organizing power which was the genius of his character. The course of railroading tended westward, and the young engineer, eager for pioneer work, enlisted his services with the New York & Erie Railroad, then extending its lines eastward from Dunkirk, its western terminus. The first duty assigned him was that of conveying from Boston, Mass., a locomotive for use on the new extreme western section of the road, and in November, 1850, by means of coaster, canal boats and other transports, he succeeded in discharging his ponderous freight upon the lines of the road for which it was intended, and to him belongs the honor of having blown the first locomotive whistle in the county of Chautauqua, among whose hills and valleys there now resounds and echoes the shrill screech of a thousand locomotives.

For six years Mr. Brooks continued at his post as engineer on the western section of the Erie Road, contributing largely, by an interested performance of his duty, to the road's rapid development. In 1856, he was tendered, and accepted, the position of Master Mechanic of the Ohio & Mississippi Railroad, where he remained four years, when he again returned to Dunkirk, and the Erie service, as Master Mechanic of the Dunkirk shops. Two years later, in recognition of the increasing value of his skill and judgment, he was made Superintendent of the western division of the road, and in 1865 was still further advanced, and became Superintendent of Motive Power and Machinery for the entire road extending from Dunkirk to New York. In 1869, under stress of financial difficulty and for purposes of retrenchment, the management of the Erie determined to close up the Dunkirk Mr. Brooks, throughout his association with the road, held close his personal interest in the community in which his first Erie successes had been achieved, and which had grown, under his eye, to a large and busy town. In order to avert the calamity which now threatened it, he opened negotiations with the Erie Company, with a view of leasing the entire property and plant of the road in Dunkirk,

for the purpose of manufacturing locomotives. His negotiations were successful, the lease was executed, and on the 13th of November the Brooks Locomotive Works was organized with a manufacturing capacity of one locomotive per month. Thus in the brief space of twenty years the progressive engineer of 1849 had become the proprietary head of a great manufacturing interest.

Among the most valuable of the assets of the new enterprise was the limitless faith and untiring energy which its founder brought into play in organizing and administering its affairs. So strong was his belief that the industrial growth of America was still in its infancy, and would advance rapidly and marvelously, that the new company at once adopted a policy of extension in line with that belief. As a result, the capacity of the works had increased to seventy-two engines per year in 1872, and to a manufacturing total of 100 engines per year in 1880. In two years more the output of the works doubled - 200 complete locomotives having been turned out in 1882. In July, 1883, the works purchased from the Erie Company the entire property which it had leased, and commenced at once the erection of extensive additions to the plant. Orders were placed for a large amount of new machinery of improved types, and so well was the work of extension carried on that, in 1885, the manufacturing capacity of the works had reached 250 per year. The success of the works had now become assured, the fine faith and foresight of its founder vindicated. Not only was the plant enlarged to meet the ever-increasing demand for locomotives, but the construction of the locomotives themselves was carried on with even greater attention to the needs and demands of the service required.

On the 20th of April, 1887, Mr. Brooks died. This was a severe blow to his associates, and his loss was felt throughout the entire railroad world. He had builded too well, however, to make himself necessary to the continued success of the works. The company, gathering force from his example, and pursuing his policy of extension, met with increasing prosperity.

Edward Nichols was elected to succeed him as President of the works in June, 1888. The death of Mr. Nichols occurred in January, 1892, and he was succeeded by M. L. Hinman as President, R. J. Gross being elected Vice-President.

At the Columbian Exposition, in 1893, the works exhibited nine locomotives of various types and designs, and were awarded a first medal for excellence of design and workmanship.

April 16, 1894, a Brooks 10-wheeled engine, coupled to a Lake Shore & Michigan Southern Railway train, known as the "Vanderbilt Special," made a speed record of 78 miles per hour. This was eclipsed, however, by the "Fastest of Fast Runs," which was made on the 24th of October, 1895, by a series of Brooks engines, in a run on the Lake Shore & Michigan Southern Railway, with a special train from Chicago to Buffalo, a distance of 540 miles. The average speed of this train, including all stops, was 63.6 miles. The maximum speed attained on the run was made on the Buffalo Division by a Brooks ten-wheeled engine with 17 x 24-inch simple cylinders, as follows:

1 mile at the rate of 92.3 miles per hour.

8 consecutive miles at the rate of 85.44 miles per hour.

21 consecutive miles at the rate of 82.44 miles per hour.

33 consecutive miles at the rate of 80.6 miles per hour.

86 consecutive miles at the rate of 72.92 miles per hour.

In 1896, Mr. Hinman's health became so seriously impaired, that he resigned his office, and Frederick H. Stevens was elected President of the works, and remains the active head of its management.

ERECTING SHOP.

From the foregoing it will be seen that the Brooks Locomotive Works, starting in 1869, with a capacity of one engine per month, and having a present capacity of 400 locomotives and upwards per annum, has kept pace with the remarkable industrial progress for which this century has become notable. The plant covers an area of about twenty (20) acres, and comprises some thirty-five buildings, equipped with all modern facilities for the rapid and perfect construction of locomotives. The machine shop proper is about 400 feet long by 100 feet wide, and contains a vast array of planers, lathes, milling machines, slotting machines, boring mills, many of which are electrically driven by motors placed on each machine. A number of the smaller tools, such as drills and hammers, are operated by pneumatic power. A separate machine shop is provided for taking care of the cylinders. This shop is over 200 feet long and about 58 feet wide, and is furnished with some of the largest and most powerful machinery made in this country.

The iron foundry is over 250 feet long by 100 feet wide, and has two thirty-ton cupolas, located near the center of the shop. This foundry is provided with two powerful electric overhead traveling cranes, which traverse the entire length of the building. In the south end are located three large core ovens. All the iron and coke for the cupolas are elevated to the charging floor by means of an electric elevator. Everything in this building is driven by electricity, no steam power being used.

Large and commodious boiler shops of steel construction have recently been constructed. One of these shops is about 450 feet long by 80 feet wide, and the other about 180 feet long by 90 feet wide, and have a total area of about 50,000 square feet. They are splendidly equipped with all the latest improved machinery including one of the most powerful hydraulic flanging presses in the world. This department is also provided with three powerful electric overhead traveling cranes, one of twenty-five tons lifting capacity, one of twenty tons and one of ten tons.

The carpenter shop is 269 feet long by 52 feet wide, and is a model of its kind.

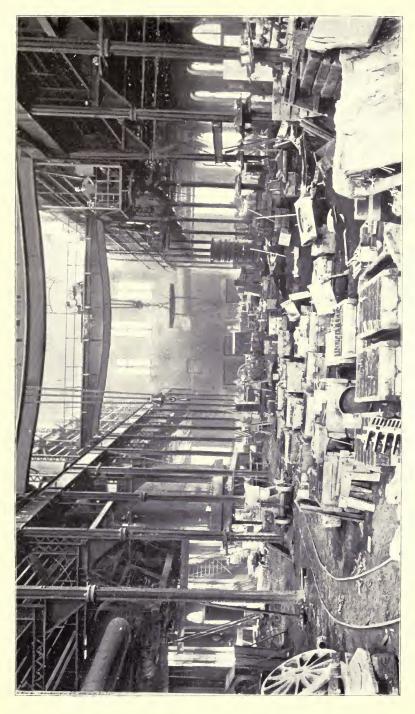
The tank shop is a two-story building, 154 feet long by 65 feet wide.

In the steam-power house are located four batteries of the most modern type of water tube boilers, furnishing about 1,200 horse-power. Adjoining this building is the electric-power house, where all the electricity used in this extensive plant is generated by means of three large generators—one of 500 horse-power, another of 200 horse-power, and the third of 100 horse-power, all directly connected to automatic high-speed engines.

There has recently been added to the plant a new and commodious erecting shop. This new building is of approved and up-to-date design, and a description of its prominent features should prove of some interest to those who favor progressive and advanced methods of manufacture.

The building referred to covers an area of 17,595 square feet, is 255 feet long, 69 feet wide and 60 feet high to apex of roof. The frame of the building is composed wholly of structural steel. The walls above the upper crane runway are of brick, while below the runway the outside wall is wholly of glass, set in substantial frames, the lower tiers of which are arranged on balance weights, thus admitting of their being lifted for the convenient egress and admission of locomotives. The opposite side of the building opens directly into the old erecting shop, thereby more than doubling the floor space heretofore available for the erection of locomotives.

Within the floor space is included sixteen engine pits of brick masonry, four feet wide, and each extending forty feet in length between tracks.



The building is traversed its entire length by two Morgan Engineering Company's latest improved Electric Cranes. The larger of these cranes is of 120 tons capacity, and is equipped with two trolleys of sixty tons capacity each, one of the trolleys having in addition an auxiliary hoist of five tons capacity. This crane has a span of sixty-four feet, and runs upon a 100-lb. rail at a height of thirty-eight feet and one inch from floor, lifting and carrying with ease and rapidity the heaviest locomotives of modern construction. The smaller crane, equipped with two ten-ton trolleys, has a span of sixty-one feet, and runs upon a sixty-lb. rail twenty-seven feet three inches from floor. This crane is used in handling the lighter parts of engines during the process of their erection.

An indirect system of heating and ventilating has been installed, and may be described briefly as follows:

Exhaust steam is passed through a series of iron coils, thereby heating the air, which is passed over and among the coils by means of the suction produced by a large fan, which, in turn, distributes the heated air through two conduits running the full length of each side of the shop. These conduits admit the heated air into the building through openings at each one of the supporting columns of the building, by this means a continuous circulation of air is assured and the building amply heated and ventilated by an effective and economical process.

Not least among the improved processes in use in this new building is the means employed for disposing of the smoke and vapors formed in firing up and testing locomotives during their erection. For this purpose a smoke duct of brick, laid in cement, runs under the floor, and extends the entire length of the building close to and parallel with the end of the several engine pits. In firing, a workman connects the smoke stack of the locomotive with this smoke duct by means of a portable exhaust pipe and elbow, and the smoke and gases are drawn off through the duct and its outlet, by the suction of an exhaust fan operated by an electric motor.

The building is lighted with twenty-two arc lights of 2,000 candle-power, supplied by a Western Electric Generator.

In conclusion, the general extent and capacity of the works may be summed up approximately as follows:

Acreage comprised,	20
Number of buildings,	35
Number of employés,	2 000
Horse-power employed in operation of works,	2,500
Number of dynamos and motors employed in furnishing	
and transmitting power,	60
Number of electric traveling cranes,	10
Number of incandescent electric lamps in service,	700
Number of arc electric lamps in service,	150
Consumption of coal per week,	400 tons.
Capacity of works per annum,	

ELECTRICAL POWER HOUSE,

PISTON VALVES.

About two years ago, after proper experimenting, we concluded to introduce the use of valves of the piston type upon our heavier locomotives carrying high pressures, in place of slide valves, as we found with the latter, when made of sufficient size for the large cylinders and high pressures in use upon heavy power, that the wear not only of the valves and seats but also the entire link motion was excessive, and that such engines were hard to handle. We, therefore, adapted to our different types of locomotives our improved form of cylinders having the valve chests cast integral therewith and improved piston valves arranged with internal admission, enabling us to secure the shortest possible steam passage from the top of the cylinder saddle to the admission edges of the valve. This passage or chamber is of extremely large area with a very small surface exposed to external cooling influences, even this portion being jacketed over. cylinder proper is practically free from the cooling influences which obtain in cylinders provided with slide valves and external steam chests. The steam ports from the valve chest to the cylinder are as short and direct as it is possible to make them, and, on account of this shortening in length, we are enabled to make them of much larger sectional area than is possible in a slide valve cylinder, thereby reducing the loss of pressure due to frictional resistance which is so noticeable in slide valve cylinder engines.

As the result of the foregoing improvements, indicator cards obtained from our locomotives equipped with improved piston valve cylinders show an admission line having a reduction in pressure not exceeding two per cent. of the boiler pressure itself.

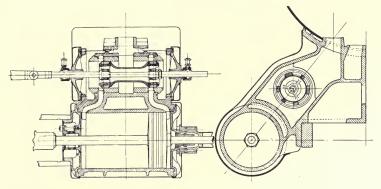
Further, by the use of the improved piston valves, which are absolutely balanced under all conditions, we are enabled to use much larger steam ports than is possible or practicable with slide valves, at the same time putting no unnecessary strain and wear upon the link motion. This increase in the size of the ports permits the use of a longer lap on the valve than is possible with a slide valve, giving the same power at maximum cut-off as with the shorter lap on the slide valve. This combination gives a remarkably free opening on the exhaust side, consequently reducing the back pressure in the cylinder to as low a point as is desirable.

From the foregoing we obtain the following improvements and increase in efficiency:

First.—An increase of pressure on the admission line or positive side of the diagram.

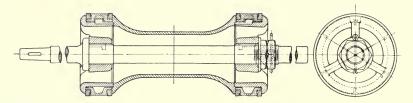
Second.—A decrease of pressure on the exhaust line or negative side of the diagram.

Consequently, as the total efficiency of the engine is rated by the difference between the positive and negative side of the indicator card or diagram, it will readily be seen that the total efficiency or power developed by our piston valve cylinders is considerably higher than is obtainable from slide valve cylinders.



On account of the use of piston valve cylinders, the weights, not only of the cylinders themselves, but also their attachments and the forward end of the frames of locomotives so equipped, are materially reduced, the piston valve cylinders enabling us to secure a design throughout which is not only considerably lighter but also more efficient in every particular than on similar types of engines equipped with slide valve cylinders. This not only applies to the cylinders and allied parts themselves, but also to the frames and link motion. With piston valve cylinders we are enabled to use a very light and yet remarkably strong front end frame, in which the center line of strain, both from the cylinders and also from the draw bar or couplings, is centralized in the frame itself. The design of the piston valve cylinders themselves is such that a saving in weight of metal is effected and at the same time a considerable increase in the strength of the cylinder is obtained. There are also several other minor improvements in the construction of our locomotives equipped with piston valve cylinders which cannot be so readily applied to engines equipped with slide valve cylinders. We have a large number of engines equipped with piston valve cylinders in operation upon various large railroads in the United States and abroad, all of which are carrying from 180 to 210 pounds boiler pressure. The reports of the performance of these engines are most gratifying, both as regards power obtained, economy in fuel, speed, steady riding, easy handling, etc.

The general design of our cylinders, also the construction of the valve and packing, will be noted in the annexed cut.



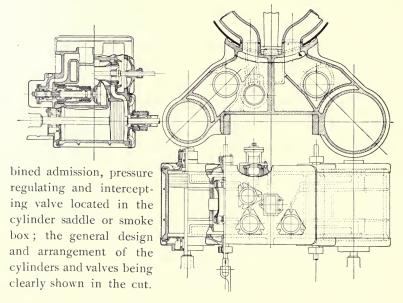
We have lately brought out an adaptation of the marine type of piston valve packing which so far has given us gratifying results. We are also engaged on other improvements in piston valves, which we expect to give even better results.

COMPOUND LOCOMOTIVES.

WE BUILD COMPOUND LOCOMOTIVES OF BOTH THE TWO AND FOUR CYLINDER TYPE.

TWO CYLINDER COMPOUNDS.

Our two cylinder engines are of the usual cross compound receiver type, fitted with a Player patent improved automatic com-





The combined valve admits live steam at reduced pressure to the low pressure cylinder, this pressure being regulated in such ratio as desired, the intercepting valve at the same time automatically closing and preventing the live steam pressures from working against the high pressure piston, the reducing valve remaining open until such time as the pressure in the receiver pipe on the high pressure side of the intercepting valve becomes equal to or slightly in excess of that on the low pressure side, when the pressure regulating valve automatically closes and the intercepting valve opens simultaneously, the first cutting off the supply of live steam to the low pressure cylinder, the second opening connection between the two ends of the receiver and allowing the high pressure exhaust steam to act directly on the low pressure piston and at the same time locking the pressure regulating valve upon its seat and preventing the further admission of direct steam to the low pressure cylinder, these valves remaining in this position during the time the throttle valve is open. In order to give the engineman full command of the locomotive at all times, controlling valves are provided in the receiver, these are usually placed upon the bottom of the receiver, and are connected to the cab by suitable levers; they may, if desired, be of larger area and arranged in the upper portion of the receiver, connected with the exhaust pipe and arranged to work automatically in combination with the intercepting valve, so that the locomotive can be worked as a simple engine when required. However, on account of the arrangement of combined admission and pressure regulating valve, which at all times when necessary admits sufficient steam to the low pressure cylinder to give the locomotive its maximum power, the use of such a separate exhaust valve, whereby the engine can be worked simple for long periods, has been found in practice unnecessary, the arrangement of admission and pressure regulating valve previously referred to automatically performing all the requirements of a simple locomotive.

This valve operates as follows: Live steam operates upon the high pressure piston in the usual manner. At the same time steam is admitted to the high pressure end of the pressure regulating valve through the connecting pipe, causing the valve to open, passing thence through the hollow portion of the valve, causing the intercepting valve to automatically close against its seat. This steam flows through the passages of the intercepting valve into the low pressure end of the receiver and, acting upon the large end of the pressure regulating valve, causes it to partially close as soon as the requisite pressure is obtained, and thereafter regulates the amount of

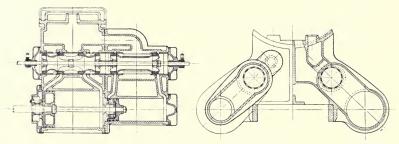
steam admitted by the pressure regulating valve, maintaining an even pressure in the receiver. The reduced pressure steam thus admitted to the receiver acts upon the low pressure piston in the usual manner. As soon, however, as the high pressure cylinder has exhausted sufficient steam into the high pressure end of the receiver to overbalance the intercepting valve, this valve opens automatically, at the same time locking the pressure regulating valve against its seat. The exhaust steam from the high pressure cylinder then flows through the receiver and acts directly upon the low pressure piston, the pressure of this exhaust steam, even when considerably reduced, being sufficient to keep the pressure regulating valve closed through the action of the combined valves at all times.

We build these engines, either with slide valves or improved piston valves as shown in cut, as desired.

This type of compound has been in successful operation for the past eight years.

FOUR CYLINDER COMPOUNDS.

Our four cylinder compounds are the Player patent tandem type, in which the low pressure cylinders and steam chests are attached to the smoke-box in the usual place and manner, and the high pressure cylinders and steam chests are attached preferably to the forward end of the low pressure cylinders, and having steam chests communicating with the steam chests of the low pressure cylinders. The steam is supplied to the high pressure valve chests through suitable connecting pipes, and the low pressure cylinder exhausts through the saddle in the usual way. The high pressure steam chests are fitted with hollow piston valves having internal admission, the low pressure



steam chests being also fitted with internal admission piston valves as shown in annexed cut.

One of the chief advantages of this type of compound is that the castings for the tandem compound cylinders are and can always be made absolutely interchangeable with those of a simple engine, this arrangement necessitating no change whatsoever back of the crosshead and valve rod keys or in the steam and exhaust pipes in the smoke-box, the compound cylinders thus giving no more cost for application than would be the case in applying a new pair of simple cylinders to an engine.

The high pressure cylinder is generally located ahead of the low This, however, is not necessary, and in some types of locomotives having four-wheel trucks it is preferable to place the high pressure cylinder back of the low pressure, thus materially reducing the weight and rendering the parts more accessible. The pistons of the high and low pressure cylinders are arranged upon the same rod, and the intermediate head between the high and low pressure cylinders is fitted with suitable metallic packing. The low pressure steam chest is provided with a reducing and starting valve connecting with the high pressure steam pipe. This valve is permitted to operate automatically when the reverse lever is in full forward or full back gear. In the intermediate positions of the lever, this reducing valve is locked to its seat so that it is rendered inoperative, and the engine must necessarily work compound at all times under all conditions of steam pressure when the reverse lever is in any other position except full gear. The use of this combined starting and reducing valve permits the introduction of steam into the low pressure cylinder at an equivalent to the maximum pressure obtained in this cylinder when the engine is working compound. Of course, as soon as the engine has made one revolution and the receiver is charged with exhaust steam from the high pressure cylinder, the starting valve becomes inoperative, thereby necessitating the engine to work compound.

The reducing and starting valve being automatic, responds absolutely to all variations of pressure and allows the engine to start without jerking or slipping, as is the case when high pressure steam is wire drawn into the low pressure cylinder.

We also have other types of valve gear for this engine, one with external admission valves, and another in which the high pressure valve has internal admission and the low pressure valve external.

This type of compound has been in successful operation for the past seven years.

TABLES.

We append three tables relating to compound locomotives.

Table A giving the relative diameters of cylinders for simple and compound locomotives, assuming the same boiler pressures. The ratio between high pressure and low pressure cylinder volumes for two cylinder compounds being 1—2.25, and for four cylinder compounds 1—3.5, these being the most desirable ratios at the prevailing pressures.

Table B gives the relative diameters of cylinders of simple engines and two cylinder compounds for various boiler pressures.

Table C gives the same information for four cylinder compounds.

TABLE A.

COMPOUND CYLINDERS.

Relative Diameters of Cylinders for Simple and Compound Locomotives.

SIMPLE ENGINES		LINDER DUNDS	FOUR CYLINDER COMPOUNDS			
DIAMETER OF CYLINDERS	DIAMETER OF HIGH PRESSURE CYLINDERS	DIAMETER OF LOW PRESSURE CYLINDERS	DIAMETER OF HIGH PRESSURE CYLINDERS	DIAMETER OF LOW PRESSURE CYLINDERS		
10	11	$16\frac{1}{2}$	7	13		
11	12	18	8	15		
12	13	$19\frac{1}{2}$	$19\frac{1}{2}$ 9			
13	$14\frac{1}{2}$	22	22 $9\frac{1}{2}$			
14	$15\frac{1}{2}$	$23\frac{1}{2}$	10	$18\frac{1}{2}$		
15	$16\frac{1}{2}$	25	11	$20\frac{1}{2}$		
16	$17\frac{1}{2}$	$26\frac{1}{2}$	12	$22\frac{1}{2}$		
17	19	$28\frac{1}{2}$	$12\frac{1}{2}$	$23\frac{1}{2}$		
18	20	30	13	$24\frac{1}{2}$		
19	21	$31\frac{1}{2}$	14	26		
20	22	33	$14\frac{1}{2}$	27		
21	23	$34\frac{1}{2}$	$15\frac{1}{2}$	29		
22	24	36	16	30		
23	25	$37\frac{1}{2}$	17	32		
24	26	39	$17\frac{1}{2}$ 33			

2411 23, 33 OLAM. OF H. P. OVLINDER. RELATIVE DIAMETERS OF CYLINDERS. FOR TWO CYLINDER COMPOUND. 240 230 220 BOILER PRESSURE. 200 190 180 170 160 150 22, DIAMETER OF CYLINDERS OF SIMPLE ENGINE. 12: 10, 20 2,

TABLE B.

RATIO OF CYLINDER VOLUMES = 3,50 16" 15" RELATIVE DIAMETERS OF CYLINDERS. FOR FOUR CYLINDER COMPOUND. 250 240 220 BOILER PRESSURE, 200 190 180 160 22", DIAMETER OF CYLINDERS OF SIMPLE ENGINE. 20, 12: 10, 2

TABLE C.

SPECIFICATIONS.

We give below the form of specification used by the Brooks Locomotive Works. It will be noted that this does not elaborate on specific methods of construction, it being well known that these vary with different conditions and in the various localities for which our locomotives are constructed. It is our aim to meet the views of our patrons and to furnish locomotives well designed, properly proportioned and carefully constructed, in all their parts, of the best material and finish, in a workmanlike manner. We are constantly making improvements, and do not hesitate to immediately adopt the latest and best features. By so doing our locomotives are always up to date and as efficient as it is possible to make them.

BROOKS LOCOMOTIVE WORKS,

DUNKIRK, N. Y., U. S. A.,

DESIGNERS AND BUILDERS OF STRICTLY HIGH-GRADE LOCOMOTIVES.

SPECIFICATION

OF A LOCOMOTIVE ENGINE.

TYPE DIA STROKE NO. DIA NO. DIA NO. DIA NO. DIA NO. DIA TYPE DIA TYPE FLUES WHEEL BASE AVERAGE WEIGHT IN WORKING ORDER, DIA LENGTH DRIVING EIGID ENGINE STRANGE NO. TEADERS WHEELS DRIVERS WHEELS BOLLER FUEL LIMITATIONS TOTAL OUNDS NIND WEIGHT ON DRIVERS WEIGHT WEIGHT WEIGHT WIETH LENGTR WHEEL AND.	POUNDS TOTAL ENGINE	
FLUES WHEEL BASE AVERAGE WEIGHT IN WORKING ORDER, D. DIA. LENGTH DRIVING SIGID ENGINE STRENGER AND TENDER TRACES. BOILER FUEL LIMITATIONS WEIGHT WEIGHT TOTAL MELON WITH LENGTH TOTAL	TOTAL ENGINE	
FLUES WHEEL BASE AVERAGE WEIGHT IN WORKING ORDER, DIA. LENGTH DRIVING RIGHD ENGINE STRUCKS TENDER WHEELS DRIVERS WREELS BOILER FUEL LIMITATIONS WEIGHT WHICH TOTAL MELVE WEIGH INDICES TOTAL	TOTAL ENGINE	
DIA. LENGTH DEIVING RIGID ENGINE REGINE AND TENDER TRAILING WHEELS DRIVERS WHEELS BOILER FUEL LIMITATIONS WEIGHT WHICH TOTAL MELVE WIDE INCIDENT TOTAL	TOTAL ENGINE	
DIA. LENGTH DRIVING RIGHD ENGINE TENDER TENDER WHITELS DRIVERS WHEELS BOILER FUEL WEIGHT WHICH TOTAL MELON WHEN INCIDENT TOTAL	RNGINE	
BOILER FUEL LIMITATIONS RESSURE WEIGHT WHICH TOTAL MEIGHT WHICH TOTAL		
BOILER FUEL LIMITATIONS RESSURE FUEL WEIGHT WEIGHT TOTAL MEIGHT WEIGHT TOTAL		
RESSURE FUEL USEGNT TOTAL MEIGHT WEIGHT TOTAL		
	GAUGE OF TRACK	
	FEET INC	
GENERAL DESIGN SHOWN BELOW. PHOTO. OF ENGINE NO.		
CATALOGUE PAGE NO.		
DIAGRAM, SHEET NO.		
CARD OR SKETCH NO.		

DETAILED SPECIFICATION.

BOILER.	Of the "Crown Bar," "Radial Stayed," or Improved "Belpaire" type, built straight or wagon top with conical connection. Dome of suitable size, located to suit construction
MATERIAL.	Material of shell, best homogeneous boiler steel
Construction. Test.	Boiler well designed, carefully constructed, substantially riveted and thoroughly braced in all its parts, having an ample factor of safety to carry the working pressure, plates planed at edge and caulked with round nosed pneumatic tool, tested by water to 40 per cent. and by steam to 25 per cent, above the working pressure.
RIVETING.	Longitudinal seams quadruple, quintuple or sextuple riveted, according to location, size and pressure; rivets of suitable sizes for the thickness of plates.
FIRE-BOX.	Of the deep, sloping or long type, between or over frameslong andwide inside sheets.
MATERIAL,	Plates of best homogeneous fire box steel, thoroughly annealed after flanging
MUD RING.	Accurately fitted and substantially riveted, water space
STAY-BOLTS.	Of best double refined iron
Crown Stays.	Crown sheet securely supported by crown bolts with conical neck and head under sheet, radial or direct stays with heads under sheet screwed into sheets from inside and riveted over on outside, and spaced not over
	Crown bars of suitable size, each formed from two bars of iron welded together at ends and spaced not over
FLUES.	Of best lap welded charcoal iron or steel
Вкіск Аксн.	Fire brick arch supported on studs.
Washout Plugs, Etc.	Blow off cock in bottom of fire box leg, suitable washout plugs in corners and sides of fire box, in front end and above crown sheet.
THROTTLE VALVE AND STEAM PIPES.	Cast iron balanced throttle valve in dome,large wrought iron dry pipe attached to suitable tee head and cast iron steam pipes in smoke box
EXHAUST PIPE.	Exhaust pipe in smoke box of cast iron, with suitable nozzles
Smoke Box.	Short extension smoke box, with suitable netting, deflector and cinder valve, front and door flanged steel
STACK.	Straight or taper pattern of cast iron or sheet steel with flanged base
GRATES.	Suitable for the fuel. Cast iron, rocking pattern; operated from cab
Ash Pan.	Suitable for the fuel. Arranged with suitable cleaning holes; dampers front and rear operated from cab.

${\tt DETAILED\ SPECIFICATION.-(Continued.)}$

FRAMES.	Of best hammered iron. Main frames and pedestals forged solid, accurately planed and slotted. Front frames securely spliced to main frames. Pedestal tie bars well secured to frames				
Braces.	Frames thoroughly braced together and to boiler by suitable castings, braces, expansion plates and pads				
TRUCKS.	Leading truck of thewheel type, with swiveling and swing centre or swing centre and radial bar.				
LEADING WHEELS	. Leading truck wheelsinches nominal diameter				
	Axles of hammered iron or steel, journalsinches diameter, inches long				
	Trailing truck of thewheel type, with swiveling and swing centre and radial bar.				
TRAILING	Trailing truck wheelsinches nominal diameter				
Wheels.	Axles of hammered iron or steel, journalsinches diameterinches long.				
TRUCK FRAMES.	Of wrought iron, pedestals of wrought or cast iron. Boxes of cast iron with heavy brass or bronze bearings				
DRIVERS.	Driving wheelsin number,inches diameter outside of tires.				
WHEEL CENTRES.	Of cast iron or steelinches diameter, well designed, properly proportioned and carefully counterbalanced				
Tires.	Driving tires of best open hearth steel3inches thick when finished.				
	1st, 2d, 3d, 4th pairs flanged $5\frac{1}{2}$ inches wide				
	1st 2d, 3d, 4th pairs plain 6inches wide				
AXLES.	Driving axles of hammered iron or steel,journalsinches diameter,inches long				
Boxes.	Driving boxes of cast iron or steelwith heavy brass or bronze bearings carefully fitted, provided with shoes and adjustable wedges.				
SPRINGS.	All springs under engine of the best crucible cast steel properly proportioned for their loads				
Equalization.	Spring rigging and equalization of the best design to secure easy riding. All bearings thoroughly hardened.				
CYLINDERS.	Slide valve pattern or improved piston valve type. Horizontal, outside connected high pressure inches diameter, low pressure inches diameter, inches stroke, of close grained hard cast iron, each with half saddle, carefully fitted together and perfectly interchangeable.				
Heads and Chests.	Cylinder heads of cast iron, steam chests of cast iron, covers of cast iron				
Pistons.	Of cast iron or steelfitted with approved form of cast iron packing rings.				
PISTON RODS.	Of hammered steel				
Packing.	Metallic packing on piston rods and valve stems				
VALVE MOTION.	Approved shifting link type, graduated to cut off equally at all points.				
	Valvesbalanced slide valve or improved piston type				
	Links, blocks, lifters, jaws and pins of hammered ironthoroughly case hardened.				
	Rockers hammered iron or cast steel, reverse shaft wrought iron or cast steel, reverse lever with finely graduated quadrant				
Eccentrics.	Of cast iron keyed to axles, straps of cast iron				
Guides.	Of hammered iron or steel case hardened, securely bolted to cylinder heads and to heavy hammered iron guide yoke extending across frames. Guides and cross-headstype.				
Cross-Heads.	Of cast steel with heavy brass or bronze bearings				
RODS.	Connecting rods of hammered iron or steel, with straps, wedges or keys and brasses.				
	Coupling rods of hammered iron or steel, with straps, wedges or keys and brassesor solid ends with heavy bushings properly secured.				
CRANK PINS.	Of hammered steel of ample proportions				
•••••					

DETAILED SPECIFICATION.—(Continued.)

CAB.	Engine cab well designed and substantially built of seasoned hard wood roof of pine covered with tin plate, or constructed of steel with double roof,			
	Cab conveniently arranged for engineman and fireman, with roomy deck			
Run-Boards.	Suitable run-boards of hard wood, or run-plates of steel with steel nosings, extending from cab to front end.			
Steps.	Engine provided with convenient and safe steps and grab handles wherever required.			
Handrails.	Neat, well arranged and safe handrails of suitable size.			
BUMPERS.	Substantial bumper beams, securely attached to frames, of oak, iron or steel, neatly finished, on front and rear ends			
Pilot.	Made of well seasoned hard woodwell bolted to bumper and thoroughly braced			
COUPLERS.	Suitable drawheads or couplers, securely attached to bumpers front			
MOUNTINGS.	Engine provided with sand box with suitable pipes operated from cab.			
	Bell			
FITTINGS.	Steam gauge,			
Lubrication.	All bearings on engine provided with suitable means for their proper lubrication, adjustable oil cups of ample capacity provided where required.			
	Cylinders and valves oiled from cab through copper pipes under jacket by improvedsight feed lubricator			
FEED WATER.	Supplied by two improved injectors of proper capacity, with suitable steam, feed and check valves and well arranged piping			
SAFETY VALVES.	Twoimproved locomotive pop valves of suitable size, located in dome cover or auxiliary turret,carefully tested and set to blow at two and three pounds above working pressure.			
TOOLS.	A complete set of engine tools provided. Two screw jacks with levers,			
	One set of engine oilers and oil cans, torch, torch holder, etc. One set firing tools, scoop shovel, coal pick, slice bar, clinker hook, ash hoe, pail and broom.			

Lagging.	Boiler and dome lagged with, cylinders and chests lagged with			
FINISH.	Boiler jacket and bandsplanished iron. Neat dome casing with painted iron body with cast iron top and bottom rings, or flanged steel casing, sand box casings to match dome.			
	Cylinder head casings, pressed steel painted			
	Steam chest, cover casings cast iron or pressed steel painted. Cylinder and steam chest side casings of sheet iron or steel painted			
PAINTING.	Engine to be well painted and varnished, and lettered and numbered, as required.			

DETAILED SPECIFICATION.—(Continued.)

TENDER, Trucks,	Tender of the eightwheeled typehaving two four-wheeled centre bearing trucks of improved construction,side bearings on rear truck.
Wheels.	Wheelsinches nominal diameter
Axles.	Of hammered iron or steeljournals
Boxes.	Ofcast iron, with heavy brass bearings
Springs.	Of best crucible cast steel,equalized brakes with metal beams, and M. C. B. shoes on all wheels.
TENDER FRAME.	Ofwell designed, carefully constructed, and thoroughly braced, and provided with heavy draw-bar, chafing blocks and safety chains between engine and tender, and suitable draw-gear on rear end.
Tool Boxes.	Set of 3boxes, strongly made and provided with good locks.

TANK.	Water carried intank
Water.	CapacityU. S. gallons
FUEL.	Capacity of fuel space about
CONSTRUCTION.	Engine well designed, properly proportioned and carefully constructed in all its parts, and finished in a workmanlike manner. All material entering into construction of the best quality. All work and material thoroughly inspected and tested before and after working. Engine after completion fired up and tested under steam on our own tracks.
Gauges,	All principal parts liable to depreciation in service accurately made to standard gauges and templets, interchangeable with similar parts on our engines of same types and dimensions.
Threads.	All threads U. S. standard unless otherwise specified
Patents.	All patented devices, which we do not control, not provided for in this specification are excepted.
EXTRAS.	i
Brakes.	
Train Signal.	
Headlight.	
	.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,

BROOKS LOCOMOTIVE WORKS,

DUNKIRK, N. Y., U. S. A.

PHYSICAL AND CHEMICAL TESTS OF MATERIAL. General. All material used in constructing locomotives which does not fill the following

	requirements will be rejected. Notwithstanding these tests, should any defects develop in process of working the material will be rejected.					
Note.	Tensile strength is in pounds per square inch. Elongation is percentage in a test strip 8 inches long.					
Boiler Shell Steel.	All plates must be made of open hearth process steel: Tensile strength desired 56,000 pounds, minimum 52,000 pounds, maximum 60,000; elongation desired 27 per cent., minimum 25 per cent.; reduction of area 50 per cent.					
FIRE BOX STEEL.	All plates must be made of open hearth process steel: Tensile strength desired 55,000 pounds, minimum 52,000 pounds, maximum 58,000 pounds; elongation desired 28 per cent., minimum 26 per cent.; reduction of area 56 per cent.					
Analysis.	Chemical analysis for	fire box st	eel:		2.1.1	
	Desired, Maximum, Minimum,	Carbon. .18 .25 .15	Phosphorous. .03 .03	Manganese. .40 .45	Sulphur. .02 .03	Silicon. .02 .035
Tests.	Shell and fire box plates must be free from all mechanical defects, and a test piece must, without annealing, bend over on itself, cold, and after being heated to a cherry red and quenched in water, at 80 degrees, show no signs of cracks or flaws on outside edge.					
Boiler Flues.	All iron or steel flues must conform to specification, must be free from all imperfections, and must be rolled accurately to size. A test piece, 1½ inches long, cut from any flue, set on end and hammered down to ½ inch, must show no longitudinal cracks and must show no transverse cracks when solid. Each and every flue must be tested by the makers to an internal hydraulic pressure of at least 500 pounds per square inch.					
STAY BOLT IRON.	All iron for stay-bolts must be double refined, rolled perfectly round, and true to standard gauges and permit cutting a clean sharp thread. Minimum tensile strength 48,000 pounds; minimum elongation 25 per cent. A test piece, 24 inches long, must stand bending double, both ways, without showing fracture or flaw.					
BAR IRON.	All bar iron not exceeding $15/8$ inches diameter and rectangular sections not exceeding 2 square inches area; tensile strength desired $49,000$ pounds, minimum $48,000$ pounds; elongation desired 22 per cent., minimum 20 per cent. and must not show granular fracture.					
	Bar iron of larger size; tensile strength, minimum 46,000 pounds; elongation, minimum 20 per cent.					
Steel Forgings.	All steel forgings must be made from blooms of open hearth process steel, containing not over 5 per cent, phosphorous; test strips to be cut from forgings 2 inches square, hammered from blooms.					
Axles and Pins.	Steel for axles, crank pins, etc.: Tensile strength desired $80,\!000$ pounds, minimum $75,\!000$ pounds, maximum $85,\!000$ pounds; elongation desired 18 per cent., minimum 14 per cent.					
Rods.	Steel for rods: Tensile strength, minimum 70,000 pounds, maximum, 80,000 pounds; elongation, minimum 16 per cent.					
STEEL CASTINGS.	All steel castings must be made by the open hearth process, must have smooth, uniform surface, must be entirely free from blow holes, sand, shrinkage and cracks; tensile strength desired 70,000 pounds, minimum 60,000 pounds; elongation desired 18 per cent, minimum 13 per cent.					
CHILLED WHEELS.	All chilled wheels must conform to specifications of the M. C. B. and A. R. M. M. Associations, and be guaranteed 40,000 miles for 28-inch wheels, 45,000 miles for 30-inch wheels, 50,000 miles for 33-inch wheels.					
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CLASSIFICATION OF LOCOMOTIVES.

We give below classification of locomotives adopted by the Brooks Locomotive Works. Whilst the classification symbols are not arranged consecutively on account of their being an outgrowth of an earlier designation, yet it will be found by reference to the key that all engines having a similar arrangement of machinery are designated by the same fundamental symbol, the suffixes as noted below being explanatory of additional rear truck or trailers and the type of water tank employed when a separate tender is not used.

CLASSIFICATION.

The first capital letter designates the class of locomotive and indicates the general construction of the engine.

The second capital letter indicates that the engine is arranged with trailing wheels or truck.

The letter "P" represents one pair trailers or two-wheel truck, "Q" four-wheel trailing truck, and "R" a six-wheel trailing truck.

When only capital letters are used to designate the class, this indicates that the engine is provided with a separate tender.

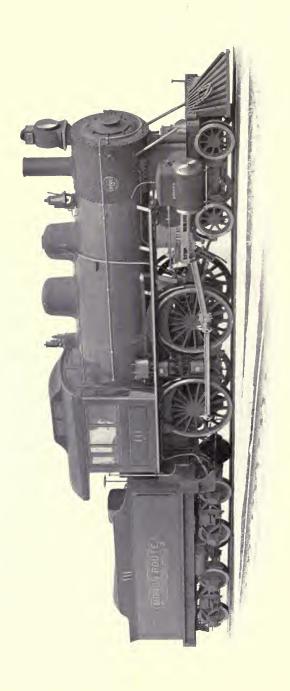
The small letters represent that the engine has no tender, but that the water and fuel is carried in tank and coal bunk attached to engine.

The letter "T" represents a saddle tank, "X" a rear tank, "Y" side tanks.

When any two of these letters are used in combination they represent that the engine is provided with tanks of both kinds which these letters designate.

There are twelve primary classes represented by the letters A to L inclusive, as under noted.

```
8-Wheel Engine with 4 Coupled Wheels and 4-Wheel Leading Truck.
                                 " 4-Wheel
D. 10-Wheel
                      6 Coupled
                  66
                                 66
                                     " 4-Wheel
                                                  66
                                                        66
F. 12-Wheel
                      8 Coupled
                                66
                  " 10 Coupled
                                     " 4-Wheel
                                                  66
G. 14-Wheel "
    6-Wheel Engine with 4 Coupled Wheels and 2-Wheel Leading Truck.
J.
                                     " 2-Wheel
    8-Wheel
                      6 Coupled
                                      " 2-Wheel
                  44
                      8 Coupled
C. 10-Wheel
K. 12-Wheel "
                 " 10 Coupled " '- 2-Wheel
                                                 6.6
E.
    4-Wheel Engine with 4 Coupled Wheels and No Leading Truck.
                                     66 66
                                             6.6
H. 6-Wheel "
                 6.6
                      6 Coupled
  8-Wheel "
                 6.6
                      8 Coupled
                                     .. .. ..
                                66
L. 10-Wheel " " 10 Coupled
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 $18\,9\,7$ for the CHICAGO, INDIANAPOLIS & LOUISVILLE Railway.

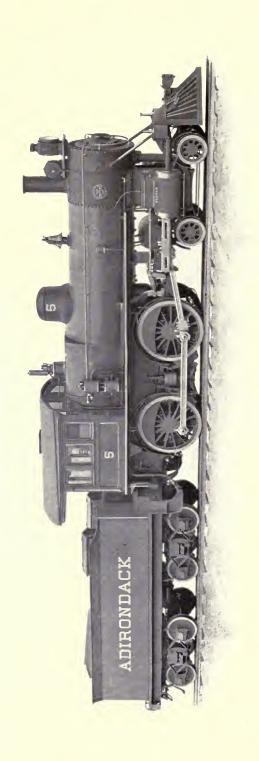
TYPE, 8-WHEELED PASSENGER. CODE WORD, QUAGGA.

WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 8½ TONS FUEL.

CLASS, 18½ A. SERIES, 604.

STROKE TEALLING COUPLED DRIVERS LEADING STROKE NO. DIA.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE ST. LAWRENCE & ADIRONDACK RALMAY.

TYPE, 8-WHEELED PASSENGER. CODE WORD, QUAHOG.

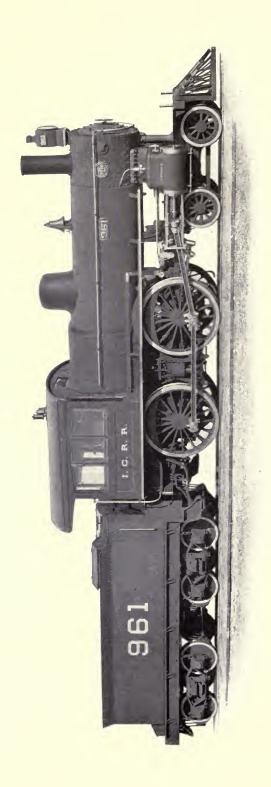
WITH 8-WHEELED TENDER

CLASS, 18 A.

SERIES, 606.

TANK CAPACITY 4230 U. S. GALLONS AND 8½ TONS FUEL.

BOX	LENGTH WIDTH	Long, Wide $107_8'' 407_8''$	Pounds	TOTAL ENGINE	122300	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE	Long, Wide Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	42300		METRES	1.435
BOILER	DIA.	,,09	IN WORKI	DRIVERS	80000	GRATE AREA	SQUARE FEET	30.4
BOI	TYPE	" Improved Belpaire	E WEIGHT	TRAILING			TOTAL	1814.16
	LEADING NO. DIA.	64" 4 28"	AVERAG	TENDER	89000	HEATING SURFACE, SQ. FT.	ARCH PIPES	154.2 13.26 1814.16
STS	COUPLED DRIVERS NO. DIA.			ENGINE AND TENDER	49′-4″	SATING SU	FIRE BOX	154.2
WHEELS	TRAILING COUT	4	WHEEL BASE	ENGINE	23'-7"	IHI	FLUES	al 1646.7
	TENDER TRAI	26" 8 33" — —	WHEE	DRIVING RIGID	'-7\frac{1}{8}'' 8'-6'' 8'-6'' 49'-4''	FUEL	KIND	Bituminous Coal 1646.7
CYLINDERS	DIA. STROKE		FLUES	LENGTH	11	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	200 B
CVLI	TYPE	Simple 18"	FL	NO. DIA.	274 2"	BOILER	POUNDS PE ABOVE AT	2



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE ILLINOIS CENTRAL RAILROAD.

CODE WORD, QUAIL.

TYPE, 8-WHEELED PASSENGER.

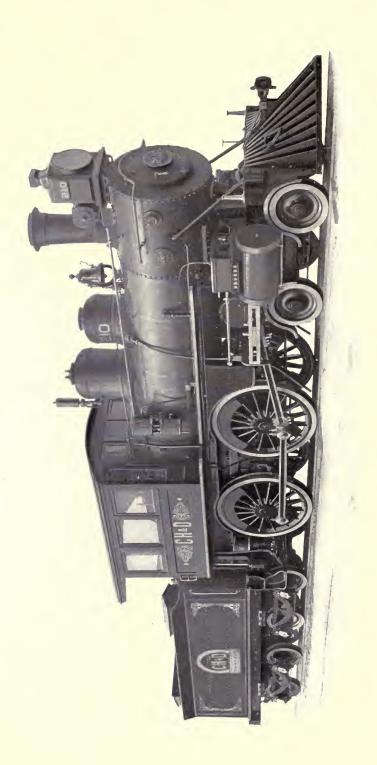
WITH 8-WHEELED TENDER

SERIES, 590. CLASS, 18 A.

TANK CAPACITY 4200 U. S. GALLONS AND 8½ TONS FUEL.

BOX	LENGTH WIDTH	$107\frac{5}{8}'' 36\frac{3}{8}''$	Pounds	TOTAL	120000	GAUGE OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	TYPE	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	40000		METRES	1.435
ER	DIA.	d 62"	IN WORKIN	DRIVERS	80000	GRATE AREA	SQUARE FEET	27.2
BOILER	TYPE	Improved Belpaire	WEIGHT	TRAILING WHEELS	T		TOTAL	1801.6
	LEADING NO. DIA.	4 36"	AVERAGE	TENDER	00006	HEATING SURFACE, SQ. FT.	ARCH PIPES	
S	COUPLED DRIVERS NO. DIA.	75″		ENGINE AND TENDER		ATING SUF	FIRE BOX	152.2
WHEELS		4	WHEEL BASE	ENGINE	274 2" 11'-7½" 8'-9" 8'-9" 50'-6"	HE	FLUES	Bituminous Coal 1649.4
	TRAIL NO.	8,	WHEEI	RIGID	%-9″	FUEL	KIND	nous Cos
	TENI	8		DRIVING				Bitumi
CYLINDERS	DIA. STROKE	Simple 18" 26" 8 38"	FLUES	LENGTH	$11'-7\frac{1}{8}''$	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	200
CYLL	TYPE	Simple	FL	NO. DIA,	274 2"	BOILER 1	POUNDS PE ABOVE AT	2

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS BUILT BY

DUNKIRK, N. Y., U.S.A.

FOR THE CINCINNATI, HAMILTON & DAYTON RAILWAY.

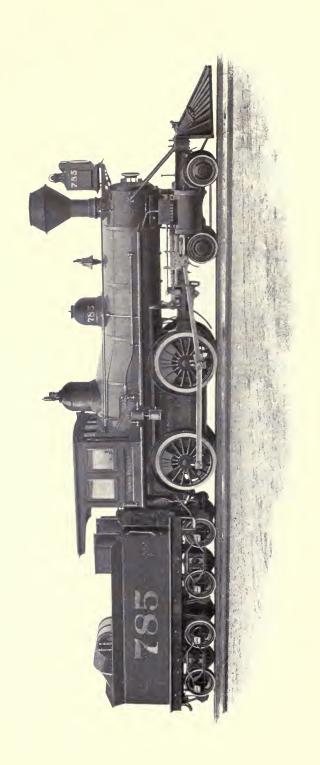
SERIES, 486. CLASS, 18 A.

> TYPE, 8-WHEELED PASSENGER. WITH 8-WHEELED TENDER

CODE WORD, QUAKER.

TANK CAPACITY 4200 U. S. GALLONS AND 8½ TONS FUEL.

								S	
	LENGTH WIDTH		102" 32"	S	TOTAL ENGINE	112000	RACK	INCHES	4'-8½"
BOX	LENGTH		102″	Pouni	10 EN	11	OF TI	FEET	4
FIRE BOX	TYPE		Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	38000	A GAUGE OF TRACK	METRES	1.435
BOILER	DIA.		ed 58"	IN WORKI	DRIVERS	74000	GRATE AREA	SQUARE FEET	22.6
BOI	TVPE		Improved Belpaire	WEIGHT	TRAILING			TOTAL	1524
	LEADING	DIA.	4 33″	RAGE	F '		, SQ.	PIPES	19
	LEA	NO.	4	AVE	FENDER	00006	RACE	ARCH PIPES	H
	COUPLED DRIVERS	DIA.	73″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	133
WHEELS	COUPLE	NO.	4	(-3		46	HEA	FLUES	1372
M		DIA.		BASE	ENGINE	22′-8′		H.	
	TRAILING	NO.	1	WHEEL BASE	RIGID	-7" 8'-0" 8'-0" 46'-8"	3L	Q	Bituminous Coal
	TENDER	DIA.	33″		ING	0,,	FUEL	KIND	ımino
		NO.	∞		DRIVING	, ,			Bitt
RS		STROKE	. 56″		LENGTH	1'-7"	SURE	INCH	
CYLINDERS		DIA.	18″	FLUES		1	PRES	PER SQ.	180
CVL		TYPE	© Simple 18"	FI	NO. DIA.	226 2"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	
			39						



FOR THE UNION PACIFIC RAILROAD.

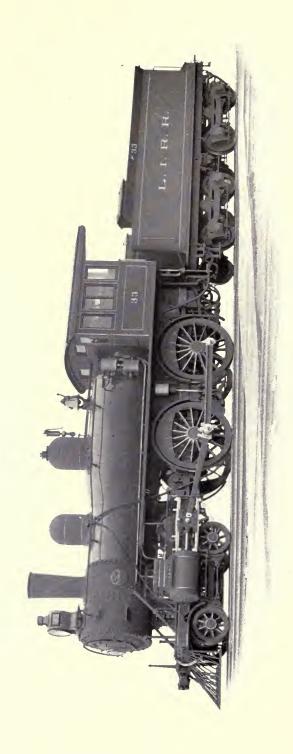
CODE WORD, QUAMOR.

TYPE, 8-WHEELED PASSENGER. WITH 8-WHEELED TENDER

CLASS, 18 A. TANK CAPACITY 2900 U. S. GALLONS AND 6 TONS FUEL.

SERIES, 293.

	nadim nadya		35"	SC	TOTAL	000001	RACK	INCHES	$4'-8\frac{1}{2}''$
BOX	E C N S I	FENGI	73″	Pouni	T	10	OF T	FEET	,4
FIRE BOX	TVDF	7117	Deep	G ORDER,	LEADING	37000	GAUGE OF TRACK	METRES	1.435
ER	DIA		r, 55"	N WORKIN	DRIVERS	63000	GRATE AREA	SQUARE FEET	17.55
BOILER	TVPF		Crown Bar, Wagon Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	TRAILING			TOTAL	1426
1	ING	DIA.	30″	RAGE	T.		So. F	PES	1
	LEADING	ON	4	AVE	FENDER	00029	FACE,	ARCH PIPES	
	COUPLED DRIVERS	DIA.	63′′		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	111.
WHEELS	UPLED	NO.	4		ENGIN	46′	HEAT	SE	rv
WE		DIA.		WHEEL BASE	ENGINE	-6" 8'-10" 8'-10" 24'-9" 46'-21""		FLUES	Biruminous Coal 1315
	TRAILING		1	EL					oal
	TR	NO.	1	WHE	RIGID	8′-10′	EL	Q.	ous C
	TENDER	DIA.	33″				FUEL	KIND	ninc
er commence of		NO.	∞		DRIVING	8′-10			Bitun
S	4.00 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	SIRONE	26″		LENGTH	<u>,</u> 9-	URE	CH	
CYLINDERS	***************************************	DIA.	18″	JES		12,	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	09
CYLII	(a	TYPE DIA.		FLUES	DIA.	2,	ER F	NDS PE	150
	TVD	111			NO.	201	BOIL	POUP	
			41						



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TYPE, 8-WHEELED PASSENGER.

CODE WORD, QUARRY.

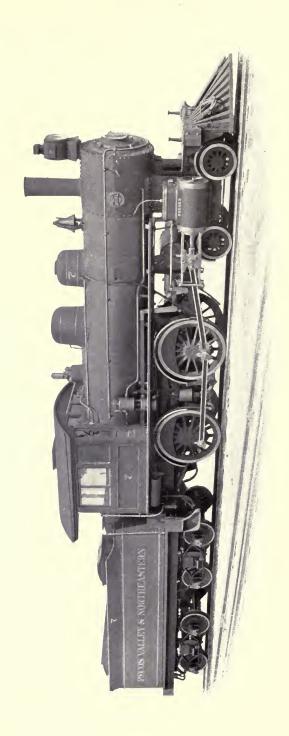
WITH 8-WHEELED TENDER

FOR THE LONG ISLAND RAILROAD,

SERIES, 639. CLASS, 18 A. TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

BOX	LENGTH WIDTH	132_4^{3} 42_4^{3} 42_4^{3}	Pounds	TOTAL	115000	OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	ТУРЕ	Rad. Stay, 56" Long, Wide 1324" 424" Wagon Top	AVERAGE WEIGHT IN WORKING ORDER, Pounds	LEADING WHEELS	33500	GRATE AREA GAUGE OF TRACK	METRES	1.435
BOILER	DIA	ry, Fop 56"	IN WORKI	DRIVERS	81500	GRATE ARE	SQUARE FEET	38.5
BO]	TYPE		E WEIGHT	TRAILING WHEELS			TOTAL	1503.9
	LEADING NO. DIA.	4 30"	AVERAG	TENDFR	85000	IRFACE, SQ.	ARCH PIPES	
WHEELS	COUPLED DRIVERS NO. DIA.	4 67"		ENGINE AND TENDER	48'-5"	HEATING SURFACE, SQ. FT.	FIRE BOX	160.9
WHE	ILING DIA.		WHEEL BASE	ENGINE	225 2" 11'-5\frac{1}{8}" 7'-6" 7'-6" 22'-0" 48'-5"		FLUES	Anthracite Coal 1343
	TENDER TRA	8 33″ –	WHE	RIGID	,,9-,,	FUEL	KIND	racite Co
	TEN STROKE NO.	24" 8		I DRIVING	,9-,1 ,,	Ή		Anth
CYLINDERS	DIA. ST	=	FLUES	DLA, LENGTH	;′′ 11′-5 <u>1</u>	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
CYI	TYPE	E Simple 18"	H	NO. DI	225 2	BOILER	POUNDS ABOVE	

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

8 6 8

FOR THE PECOS VALLEY & NORTHEASTERN RAILWAY.

CODE WORD, QUARTAN.
TYPE, 8-WHEELED PASSENGE

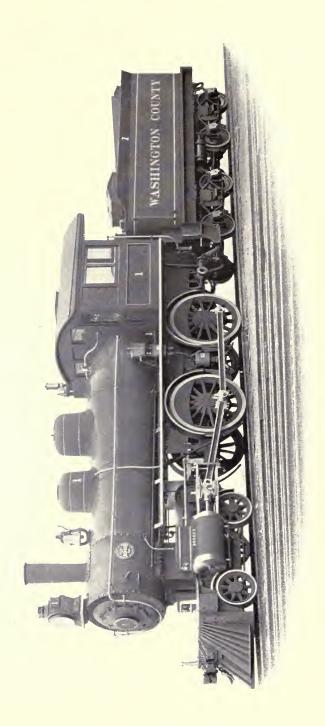
8-WHEELED PASSENGER. WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

SERIES, 664.

CLASS, 18 A.

33″ LENGTH WIDTH FEET INCHES GRATE AREA | GAUGE OF TRACK $4'-8\frac{1}{2}''$ 109000 TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS 103''FIRE BOX 1.435 METRES Long, Sloping LEADING WHEELS 37000 TYPE SQUARE FEET 28′ DIA. 23.1 72000 DRIVERS Rad. Stay, Wagon Top BOILER TYPE 1495 TRAILING TOTAL HEATING SURFACE, SQ. FT. 30″ NO. DIA. LEADING ARCH PIPES TENDER 84000 TRAILING COUPLED DRIVERS FIRE BOX 62″ DIA. 140 ENGINE AND $22'-8'' | 48'-11\frac{3}{8}''$ TENDER WHEELS NO. 1355 FLUES ENGINE WHEEL BASE DIA. Bituminous Coal **8′-0″** NO. RIGID FUEL KIND 33″ NO. DIA. TENDER %-0, DRIVING ∞ DIA. STROKE 24″ $11'-7\frac{1}{8}''$ BOILER PRESSURE LENGTH POUNDS PER SQ, INCH ABOVE ATMOSPHERE CYLINDERS Simple 18" FLUES 180 DIA. , S TYPE 225 č.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898

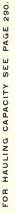
SERIES, 647.

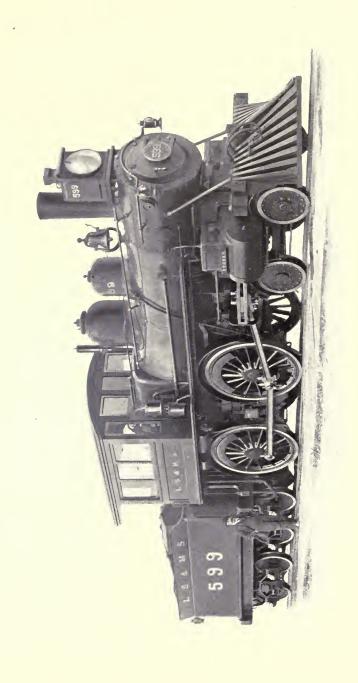
CLASS, 18 A.

FOR THE WASHINGTON COUNTY RAILROAD.

TYPE, 8-WHEELED PASSENGER. CODE WORD, QUARTIC.

	BOX	LENGTH WIDTH	97" 33"	Pounds	TOTAL	107000	GAUGE OF TRACK	FEET INCHES	4′-8½″
TONS FUEL.	FIRE BOX	TYPE	Long, Sloping	NG ORDER,	LEADING	36200		METRES	1.435
AND 81		DIA.	26″	WORKI	DRIVERS	20800	GRATE AREA	SQUARE FEET	21.8
TANK CAPACITY 4000 U. S. GALLONS AND 8½ TONS FUEL.	BOILER	TYPE	Rad. Stay, Wagon Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	TRAILING DRI WHEELS	70		TOTAL SQU	1490
Y 4000		LEADING	30″	RAGE 1	TRA	I	SQ. FT		
APACIT		LEAI	. 4	AVE	TENDER	85000	REACE,	ARCH PIPES	
TANK C	S	COUPLED DRIVERS	62″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	134
	WHEELS	COUPLE	4	SE		8″ 48	HEA	FLUES	1356
24		TRAILING		WHEEL BASE	ENGINE	, 25′-			
TENDE				WHF	RIGID	·\0-\8	FUEL.	KIND	ons C
WITH 8-WHEELED TENDER		TENI	<u>∞</u>		DRIVING	'-7½" 8'-0" 8'-0" 22'-8" 48'-11"	F.	- 1	Bituminous Coal
WITH 8-	RS	STROKE	24"		LENGTH	$1'-7\frac{1}{8}''$	SURE	INCH ERE	
	CYLINDERS	DIA.	e 18′	FLUES	DIA.	2" 11	RES	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
	CV	TYPE	Simple 18"		NO.	225 2"	BOILER PRESSURE	POUNDS	
UN	OF THE OF	AR)	47 Y						,





The locomotive described above was used by the Lake Shore & Michigan Southern Railway Co. during the Chicago Exposition in regular daily Near Elkhart, Ind., this engine attained a speed of 10.2 miles in less than six minutes, or at the rate of over 102 miles per hour. service on the "Exposition Flyer" or twenty-hour train between New York and Chicago, a distance of 980 miles.

"THE EXPOSITION FLYER."

BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

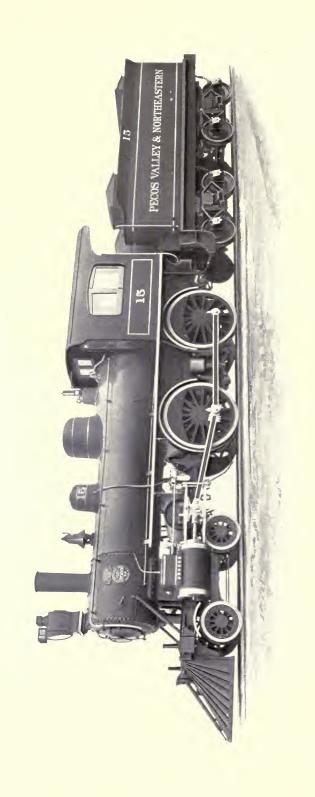
FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

TYPE, 8-WHEELED PASSENGER. WITH 8-WHEELED TENDER CODE WORD, QUARTO.

CLASS, 17 A. TANK CAPACITY 3100 U. S. GALLONS AND 7 TONS FUEL.

SERIES, 472.

BOX	The Court of the C		78" 34"	Pounds	TOTAL	104600	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TVDF		Deep	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	39500		METRES	1.435
R	DIA		22″	WORKIN	DRIVERS	65100	GRATE AREA	SQUARE FEET	18.4
BOILER	TVPF		4 33" Improved Belpaire	VEIGHT IN	FRAILING DE WHEELS			TOTAL	1398
	LEADING	NO. DIA.	33″	ERAGE V	TRA		HEATING SURFACE, SQ. Fr.	ARCH PIPES	
		NO.		AVE	TENDER	70000	URFACE		
10	COUPLED DRIVERS	DIA.	72″		ENGINE AND TENDER	<u>`</u> 8-,	TING S	FIRE BOX	140
WHEELS	COUPLE	NO.	4	SE		202 2" 12'-0" 9'-0" 33'-9" 45'-8"	HEA	FLUES	1258
	TRAILING	DIA.	1	WHEEL BASE	ENGINE	23′-			oal
		Y. NO.		WHE	RIGID	0-,6	FUEL	KIND	ous C
	TENDER	NO. DIA.	8 33		DRIVING	,,0-,6	FI	Ж	Bituminous Coal 1258
S	dia College	SINONE	24″	1	LENGTH D	,0-,	URE	ACH RE	Щ
CYLINDERS		DIA.	Simple 17" 24" 8 33"	FLUES	DIA. LEN	2" 12	BOILER PRESSURE	FOUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
CYI	TVDE		Simple	<u> </u>	No.	202	BOILER	FOUNDS	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE PECOS VALLEY & NORTHEASTERN RAILWAY.

TYPE, 8-WHEELED PASSENGER. CODE WORD, QUATRAIN.

WITH 8-WHEELED TENDER

51

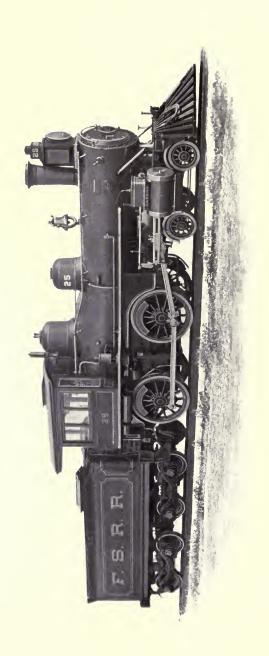
CLASS, 17 A.

TANK CAPACITY 4000 U. S. GALLONS AND 82 TONS FUEL.

SERIES, 680.

BOX		LENGTH WIDTH	96" 33"	Pounds	TOTAL	00096	GAUGE OF TRACK	FEET INCHES	1.435 $4'-8\frac{1}{2}''$
FIRE BOX	TVDE	1115	Long, Sloping	NG ORDER,	LEADING WHEELS	32000		METRES	1.435
BOILER	214		ay, Top 52"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	64000	GRATE AREA	SQUARE FEET	22
BC	TVDE		" Rad. Stay, Wagon Top	E WEIGHT	TRAILING		FT.	TOTAL	1244
	LEADING	NO. DIA.	4 30"	AVERAG	FENDER	00098	FACE, SQ.	ARCH PIPES	
10	COUPLED DRIVERS	DIA.			ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	115
WHEELS		NO.	4	SASE	ENGINE TE	$-1\frac{1}{2}$ 44	HEA'	FLUES	1129
	TRAILING	NO. DIA.		WHEEL BASE	RIGID	8′-0″ 22	II.	a	Bituminous Coal
	TENDER	NO. DIA.	8 33″		DRIVING	,,0-,8	FUEL	KIND	Bitumino
DERS		DIA, SIRONE	Simple 17" 24" 8 33"	ES	LENGTH	196 2" 11'-1" 8'-0" 8'-0" 22'-1½" 44'-0"	RESSURE	SQ, INCH OSPHERE	0
CYLINDERS	A GENT	INTE	Simple	FLUES	NO. DIA.	196 2″	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1894

FOR THE FLORIDA SOUTHERN RAILWAY.

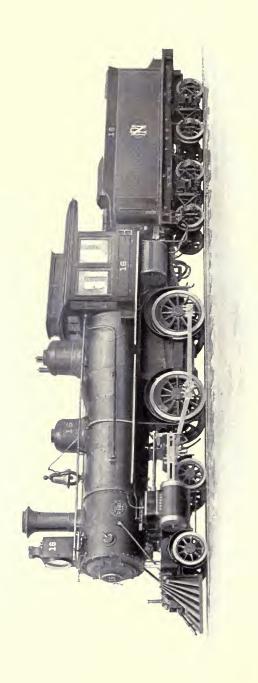
TYPE, 8-WHEELED PASSENGER. CODE WORD, QUAVER.

WITH 8-WHEELED TENDER

SERIES, 525. CLASS 17 A.

TANK CAPACITY 3500 U. S. GALLONS AND 6 TONS FUEL.

	BOX	LENGTH WIDTH		72" 35"	Pounds	TOTAL	93600	GAUGE OF TRACK	FEET INCHES	4′-8½″
	FIRE BOX	TVPE		Deep	JG ORDER,	LEADING WHEELS	35000		METRES	1.435
	BOILER	DIA DIA		1 Bar, 52" 1 Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	28600	GRATE AREA	SQUARE FEET	17
_	B	TVPF		Crown Bar, Wagon Top	WEIGH	TRAILING		FT.	TOTAL	1166
		LEADING	NO. DIA.	4 28"	AVERAGE	TENDER	00029	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	S	COUPLED DRIVERS	DIA.	62″		ENGINE AND TENDER		TING SUI	FIRE BOX	1110.7
	WHEELS		, on	4	ASE	ENGINE FNG	7-6,	HEA	FLUES	1055.7
		TRAILING	NO. DLA.		WHEEL BASE		3″ 22			
		TENDER	DIA.	33″	WH	NG RIGID	-11" 8'-6" 8'-6" 44'-9"	FUEL	KIND	Wood
			STROKE NO.	24" 8		DRIVING	8′-(E		
	CYLINDERS		DIA. STR		FLUES	A. LENGTH	7 10′-11	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	160
	CVL		TYPE	Simple 17"	FL	NO, DIA.	186 2″ 10′	BOILER	POUNDS P ABOVE A	
				53						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

1894

FOR THE NORTH PACIFIC COAST RAILROAD.

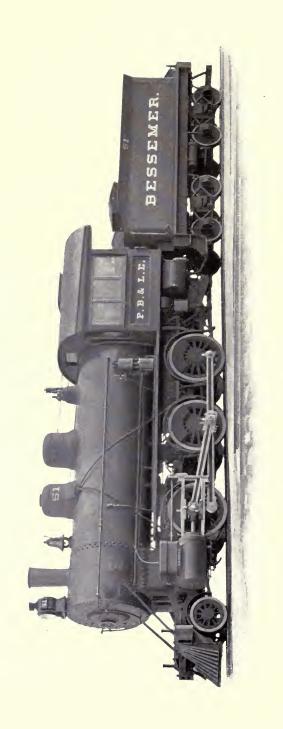
CODE WORD, QUAY.

SERIES, 523. CLASS, 15 A.

TYPE, 8-WHEELED PASSENGER.
WITH 8-WHEELED TENDER

TANK CAPACITY 2200 U. S. GALLONS AND 6 TONS FUEL.

	TDTH		24"		_ H	00	CK	INCHES	
XOX	LENGTH WIDTH		84" 24"	OUNDS	TOTAL	00089	F TRA	FEET IN	3′-0″
FIRE BOX	TYPE			AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	20000	GRATE AREA GAUGE OF TRACK	METRES	.914
BOILER	DIA		Crown Bar, 50½" Long, Wide Wagon Top	IN WORKI	DRIVERS	48000	GRATE ARE	SQUARE FEET	13.6
ВО	TVPE		Crown Wagon	WEIGHT	TRAILING		Τ.	TOTAL	855
	LEADING	DIA.	28″	RAGE	E 2		SQ. F	IPES	
	LEAL	NO.	4	AVEF	TENDER	64000	FACE,	ARCH PIPES	
	COUPLED DRIVERS	DIA.	48″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	83
WHEELS	OUPLEL	NO.	4		ENGIN	40,	HEAT	ES	772
W		DIA.		BASE	ENGINE	18′-5″		FLUES	
	TRAILING	NO. D		WHEEL BASE	RIGID	'-0" 7'-0" 7'-0" 18'-5" 40'-10"	Г	0	Bituminous Coal
	TENDER	DIA.	28″				FUEL	KIND	mino
		NO.	20" 8 28"		DRIVING	1′-0			Bitu
RS	-	STROKE			LENGTH	%-0,6	SSURE	INCH	
CYLINDERS		DIA.	15″	FLUES	DIA. I	2″	PRE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	165
CYI		TYPE	Simple	 	NO.	164	BOILER PRESSURE	POUNDS	
			55						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE PITTSBURG, BESSEMER & LAKE ERIE RAILROAD.

CODE WORD, QUEACH.

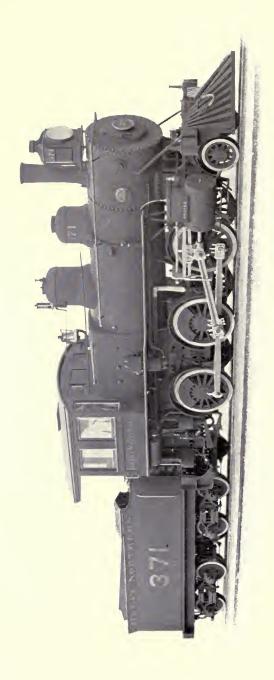
TYPE, MOGUL FREIGHT.

SERIES, 607. CLASS, 20 B.

WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

	BOX	I ENGTH WIDTH		108" 37\\\\37\\\\\4	Pounds	TOTAL	167850	GAUGE OF TRACK	FEET INCHES	4'-81"				
	FIRE BOX	TYPE		Rad. Stay, Straight Top 72" Long, Wide 108" 37\frac{37}{4}"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	22450		METRES	1.435				
	BOILER	TYPE DIA.		72″ de	N WORKI	DRIVERS	145400	GRATE AREA	SQUARE FEET	28.4				
				Rad. Stay. Straight T	WEIGHT	TRAILING			TOTAL	2057				
	WHEELS	LEADING	NO. DIA	2 33"	VERAGE		- 00	HEATING SURFACE, SQ. FT.	ARCH PIPES					
			DIA. NO	26"	WHEEL BASE	D TENDER	85000	SURFA	FIRE BOX ARG	186				
		COUPLED DRIVERS	NO.	9		ENGINE AND TENDER	52'-4"	HEATING						
		TRAILING	DIA.			WHEEL BASE	ENGINE	22′-5″		FLUES	al 1871			
			DIA, NO.	33″ –			WHEE	WHEE	WHEE	RIGID	14′-0″	FUEL	KIND	Bituminous Coal
		TENDER	NO.	∞			DRIVING	14'-0"	H	-	Bitumir			
	CYLINDERS	DIA, STROKE		20" 26"	ES	LENGTH	$12' - 0\frac{3}{8}''$	RESSURE	SQ, INCH	0				
		TVDE		Simple 20"	FLUES	NO, DIA.	300 $2''$ $12'-0\frac{3}{8}''$ $14'-0''$ $14'-0''$ $22'-5''$ $52'-4''$	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180				
1				57										



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

DUNKIKK, N. Y., US.A. 1896 FOR THE GREAT NORTHERN RAILWAY.

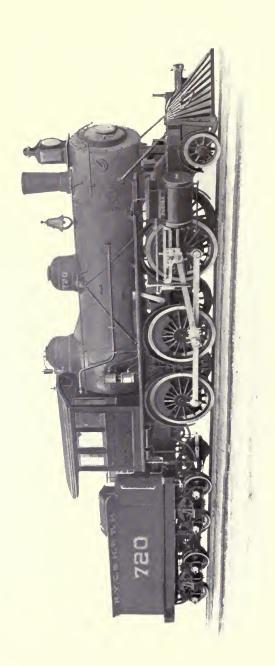
CODE WORD, QUEAN.
TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

Series, 587.

CLASS, 19 B.
TANK CAPACITY 4000 U. S. GALLONS AND 8½ TONS FUEL.

	ртн	5			0	J.K	INCHES	
	LENGTH WIDTH	98" 32"	NDS	TOTAL	30000	FRAC		4'-81"
BOX	LENG	86	Pour	- H		OF 3	FEET	
FIRE BOX	TYPE	Long, Sloping	G ORDER,	LEADING	16000	GAUGE OF TRACK	METRES	1.435
ER	DIA.	d 63"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	114000	GRATE AREA	SQUARE FEET	21.1
BOILER	TYPE	Improved Belpaire	WEIGHT	TRAILING			TOTAL	1601
	ING	30″	AGE	F .		So. 1	PES	
	LEADING		AVER	TENDER	85000	RFACE,	ARCH PIPES	
	COUPLED DRIVERS	55"		S AND DER		HEATING SURFACE, SQ. FT.	FIRE BOX	151
WHEELS	COUPLED	9	63	ENGINE AND TENDER	, 48′.	HEAT	FLUES	50
M		DIA.	WHEEL BASE	ENGINE	21′-6′		H	al 14
1		· S	WHEE	RIGID	14'-0" FUEL	EL	KIND	us Co
	TENI	8 33"		DRIVING	'-1½" 14'-0" 14'-0" 48'-4"	FU		Bituminous Coal 1450
RS	STROKE	, 26″		LENGTH		BOILER PRESSURE	INCH	
CYLINDERS	DIA.	19	FLUES		1	PRE	PER SQ.	180
CYL	TYPE	Simple 19"	FI	DIA.	250 2" 11	LER	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	
	T			NO.	250	BO1	PC A	_
		59						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1889

FOR THE NEW YORK CENTRAL & HUDSON RIVER RAILROAD.

CODE WORD, QUEBECK.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

61

SERIES, 345.

CLASS, 19 B. TANK CAPACITY 3500 U. S. GALLONS AND 7 TONS FUEL.

BOX	LENGTH WIDTH	102" 43"	Pounds	TOTAL	122000	OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$	
FIRE BOX	TYPE	TYPE ong, Wide		LEADING	16000	AGAUGE	METRES	1.435	
BOILER	DIA.	Crown Bar, Wagon Top, S8" Long, Wide 102" 43"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	IN WORKI DRIVERS	106000	GRATE AREA GAUGE OF TRACK	SQUARE FEET	29.75	
BOI	TYPE	Crown F Wagon T		TRAILING			TOTAL	1734	
	LEADING NO. DIA.	2 30"	AVERAG	TENDER	73000	FUEL HEATING SURFACE, SQ. FT.	ARCH PIPES		
STS	COUPLED DRIVERS NO. DIA.	64′′		ENGINE AND TENDER	46′-2″		FIRE BOX	144	
WHEELS	TRAILING COUPI	9	WHEEL BASE	ENGINE	$-6\frac{1}{8}$ " 14'-0" 14'-0" 21'-9" 46'-2"		FLUES	Bituminous Coal 1590	
	TENDER TRAI	33″ –		RIGID	14′-0″		KIND	ninous Co	
	TEN TEN NO.	26" 8		TH DRIVING	14'-0'	RE		Bitum	
CYLINDERS	DIA.	Simple 19"	FLUES	DIA. LENGTH	270 2" 11'-6	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	160	
	TYPE	Sim	Sim		ÖN V	270	BOIL	POUT	

FOR HAULING CAPACITY SEE PAGE 290.



1895

FOR THE MISSOURI, KANSAS & TEXAS RAILWAY.

CODE WORD, QUECK.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

63

CLASS, 19 B. TANK CAPACITY 4000 U. S. GALLONS AND 8 TONS FUEL.

SERIES, 546.

LENGTH WIDTH 96_{16}^{7} 34 $\frac{3}{8}$ FEET INCHES GAUGE OF TRACK _-8<u>1</u>″ 121000 ENGINE TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FIRE BOX METRES 1.435 16000 LEADING WHEELS Long TYPE GRATE AREA SQUARE FEET DIA. ,09 22.6 DRIVERS 105000 Crown Bar, Straight Top BOILER TYPE 1492.27 TRAILING WHEELS TOTAL HEATING SURFACE, SQ. FT. 30″ NO. DIA. LEADING ARCH PIPES 85000 TENDER 0 TRAILING COUPLED DRIVERS FIRE BOX 134.5 56″ DIA. ENGINE AND 12'-8" 12'-8" 20'-1\frac{1}{2}" 44'-11\frac{2}{4}" TENDER WHEELS Bituminous Coal 1357.77 9 FLUES WHEEL BASE ENGINE DIA. NO. RIGID FUEL KIND TENDER NO. DIA. LENGTH DRIVING ∞ DIA. STROKE BOILER PRESSURE 11′-6″ POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS 19″ FLUES 170 'n Simple TYPE 228

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898

FOR THE FLINT & PERE MARQUETTE RAILROAD.

CODE WORD, QUELQUE.

MOGUL FREIGHT.
WITH 8-WHEELED TENDER

TYPE,

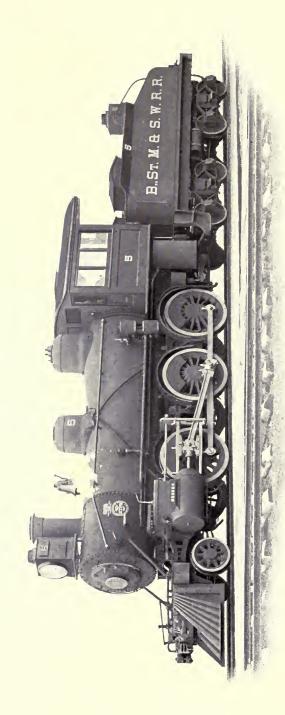
65

TANK CAPACITY 4500 U. S. GALLONS AND 121 TONS FUEL.

SERIES, 679. CLASS, 18 B.

LENGTH WIDTH 42″ FEET INCHES GAUGE OF TRACK $4'-8\frac{1}{2}''$ 137000 TOTAL ENGINE AVERAGE WEIGHT IN WORKING ORDER, POUNDS 108″ FIRE BOX METRES 1.435 Long, Sloping LEADING 17000 WHEELS TYPE GRATE AREA SQUARE FEET DIA. 62″ 30.8 120000 DRIVERS BOILER Improved Belpaire TYPE 1886 FRAILING TOTAL WHEELS HEATING SURFACE, SQ. FT. 30″ DIA. LEADING ARCH PIPES 2 90000 TENDER 0 COUPLED DRIVERS FIRE BOX 26″ DIA. 157 ENGINE AND 51′-6″ TENDER WHEELS ON. 9 1708 FLUES 23′-5″ WHEEL BASE ENGINE TRAILING DIA. Bituminous Coal 12'-1‡" 15'-0" 15'-0" NO. RIGID FUEL KIND 33″ NO. DIA. TENDER DRIVING ∞ STROKE 30″ BOILER PRESSURE LENGTH POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS DIA. 18″ FLUES 180 DIA. , '2 Simple Piston TYPE Valve 272

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE BUFFALO, ST. MARY'S & SOUTHWESTERN RAILROAD.

CODE WORD, QUEME.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

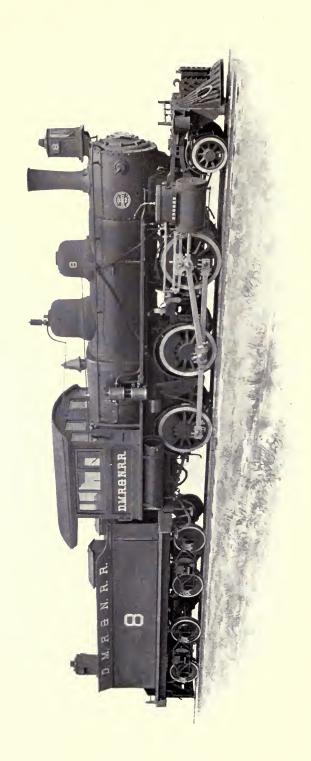
SERIES, 597.

CLASS, 18 B.

TANK CAPACITY 3100 U. S. GALLONS AND 4 TONS FUEL.

	THE COLUMN	WIDIN	33″	10	TOTAL	124000	ACK	INCHES	4'-81"
BOX	nacutar naconat	LENGIN	102" 33"	Pound	TOT	124	OF TR	FEET	4-8
FIRE BOX	TVPF		Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	16000	GRATE AREA GAUGE OF TRACK	METRES	1.435
	DIA	Ditt.	,,09	WORK	DRIVERS	108000	FE ARE	SQUARE FEET	23.3
BOILER	(I	1	Bar, Top	r IN	DRI	108	GRA'	nòs	
B(TVDF	7 7 7	Crown Bar, Wagon Top	WEIGH	TRAILING		Ť.	TOTAL	1623
	ING	DIA.	30″	AGE	TT v	'	SQ. F	PES	
	LEADING	NO.	2	AVER	TENDER	72000	FACE,	ARCH PIPES	
	COUPLED DRIVERS	DIA.	57″				HEATING SURFACE, SQ. FT.	FIRE BOX	168
SLS	LED D				ENGINE AND TENDER	47′-2	EATIN	E	
WHEELS	COU	NO.	9	SE	田田	,,9	H	FLUES	1455
	TRAILING	DIA.	1	L BA		-,07			
	TRAI	NO.		WHEEL BASE	RIGID	-1 [‡] " 13'-0" 13'-0" 20'-6" 47'-2"	1	0	Bituminous Coal
	TENDER	DIA.	33″			1	FUEL	KIND	nino
		NO.	∞		DRIVING	13′-0			Bituı
S	datodas	SIRORE	24″		LENGTH	-14″	URE	СН	
CYLINDERS		DIA.	18″	TES		11,	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	0
CYLII	3.6	4	ple	FLUES	DIA.	250 2"	ER P	NDS PER	180
	TVDE	111	Simple 18"		o'N	250	BOIL	POU	
			67						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1895

FOR THE DULUTH, MISSISSIPPI RIVER & NORTHERN RAILROAD.

WITH 8-WHEELED TENDER TYPE, MOGUL FREIGHT. CODE WORD, QUENCH.

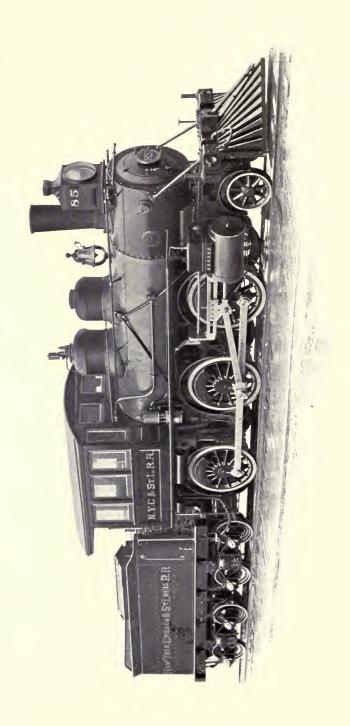
TANK CAPACITY 3500 U. S. GALLONS AND 7 TONS FUEL.

CLASS, 18 B. SERIES, 547.

LENGTH WIDTH 34″ FEET INCHES GRATE AREA GAUGE OF TRACK 110500 ENGINE TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS ,96 FIRE BOX METRES 1.435 Long, Sloping 14500 LEADING WHEELS TYPE SQUARE FRET 56″ DIA. 22.2 96000 DRIVERS Crown Bar, Wagon Top BOILER TYPE 1347.5 TRAILING TOTAL WHEELS HEATING SURFACE, SQ. FT. 28′ NO. DIA. LEADING ARCH PIPES 74000 TENDER (1) TRAILING COUPLED DRIVERS FIRE BOX 133.5 51″ DIA. ENGINE AND 48′-0″ TENDER WHEELS Š. 9 1214 FLUES 21′-6″ WHEEL BASE ENGINE NO. DIA. Bituminous Coal 11'-1" 14'-0" 14'-0" RIGID FUEL KIND TENDER 33″ NO. DIA. DRIVING ∞ DIA, STROKE 24″ BOILER PRESSURE LENGTH POUNDS PER SQ, INCH ABOVE ATMOSPHERE CYLINDERS 18′ FLUES 8 DIA. Simple 'n TYPE 212

69

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE NEW YORK, CHICAGO & ST. LOUIS RAILROAD.

CODE WORD, QUENELLA.

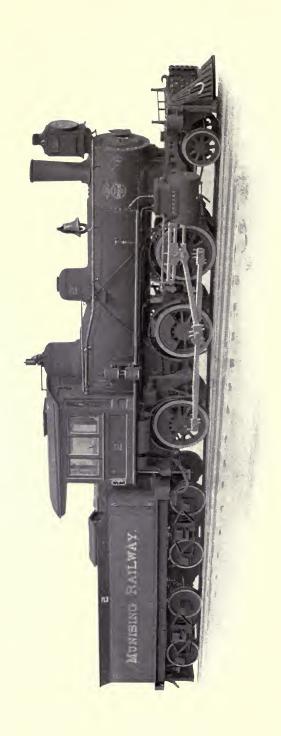
CLASS, 18 B. SERIES, 361.

TYPE, MOGUL FREIGHT.

TANK CAPACITY 3000 U. S. GALLONS AND 6 TONS FUEL.

WITH 8-WHEELED TENDER

		HTGTH WIDTH		$112'' 34\frac{1}{2}''$	NDS	TOTAL ENGINE	000001	GAUGE OF TRACK	T INCHES	4′-83″
1	FIRE BOX	TRN			R, Pou			E OF	FEET	
	FIR	TVPE		Long, Sloping	G ORDE	LEADING	15000		METRES	1.435
		DIA		26″	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	85000	GRATE AREA	SQUARE FEET	26.25
	BOILER)F	3	tay, nt Top	II IN	DRI	82	GRA	nòs	()
	B	TVDE		Rad. Stay, Straight Top 56"	WEIGH	FRAILING		Fr.	TOTAL	1274
		LEADING	DIA.	30′′	GRAGE	F.		E, SQ.	ARCH PIPES	
			NO.	2	AVE	TENDER	00009	RFACI	ARCH	1
		COUPLED DRIVERS	DIA.	26″		AND	" ₄ 5	HEATING SURFACE, SQ. FT.	FIRE BOX	117
	WHEELS	UPLED	NO.	9		ENGINE AND TENDER	44′-5	HEAT		7
	WH	-	DIA.		BASE	ENGINE	$1\frac{1}{16}$ " $15'-0$ " $15'-0$ " $22'-6$ " $44'-5\frac{1}{4}$ "		FLUES	Rituminous Coal 1157
		TRAILING	NO.		WHEEL BASE	RIGID	,0- <u>,</u>	-		Coal
		TENDER	DIA.	33″	=		15	FUEL	KIND	inouit
			NO.	∞		DRIVING	15′-0′			Ritun
	S		STROKE	24″	-	LENGTH		URE	NCH	
	CYLINDERS		DIA.	18″	FLUES	_	11,-	PRESS	ER SQ. IN	7.7
	CYLI		IYFE	Simple 18"	FL	NO. DIA.	201 2" 11'-	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

FOR THE MUNISING RAILWAY.

SERIES, 579.

CLASS, 16 B.

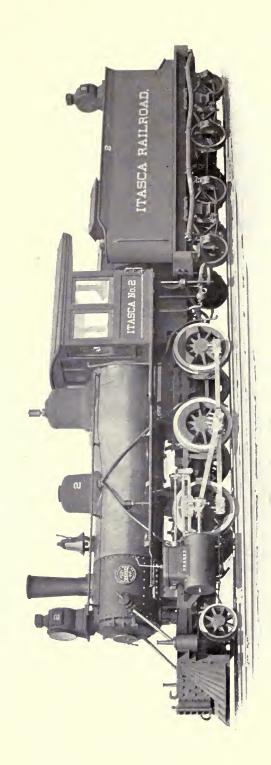
WITH 8-WHEELED TENDER

TYPE, MOGUL FREIGHT. CODE WORD, QUERCITE.

TANK CAPACITY 3000 U. S. GALLONS AND 6 TONS FUEL.

×	LENGTH WIDTH	66" 34 <u>1</u> "	INDS	TOTAL ENGINE	00006	TRACK	TT INCHES	4'-8½"
FIRE BOX	TYPE	Deep 6	ORDER, Por	LEADING WHEELS	14000	GAUGE OF TRACK	METRES	1.435
BOILER	TYPE DIA.	Crown Bar, 504"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	76000	GRATE AREA	SQUARE FEET	15.3
			E WEIGH	TRAILING		Fr.	TOTAL	905.7
	LEADING NO. DIA.	2 30"	AVERAG	TENDER	02000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
SO	COUPLED DRIVERS NO. DIA.	20″		ENGINE AND TENDER		FING SUR	FIRE BOX	95
WHEELS		9	3ASE	ENGINE ENG	1'-3" 43	HEA	FLUES	810.7
	TENDER TRAIL, ING. 0. DIA.	33" — —	WHEEL BASE	RIGID	'-0" 13'-9" 13'-9" 21'-3" 43'-1"	FUEL,	KIND	Bituminous Coal
	STROKE NO.	24" 8		H DRIVING)" 13′-9	KE.		Bitun
CYLINDERS	TYPE DIA. ST	Simple 16"	FLUES	NO. DIA. LENGTH	156 2" 10'-0	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	165
		73						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1898

FOR THE ITASCA RAILROAD.

CODE WORD, QUERCUS.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

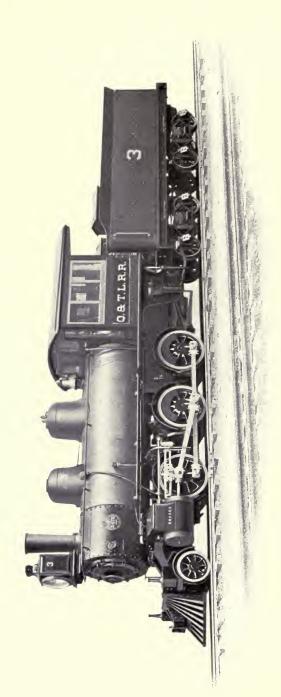
SERIES, 651.

CLASS, 14 B.

TANK CAPACITY 3000 U. S. GALLONS AND 6 TONS FUEL.

TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. No. DIA. TYPE I NO. I NO. I NO. DIA. TYPE I NO. DIA. DI			MIDIM	54" 33"	· vs	TOTAL	66500	ACK	INCHES	$4'-8\frac{1}{2}''$
TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. TAPE	BOX		LENGIA	54″	Pound	TO	99	OF TE	FEET	,4
TENDER TRAILING COUPLED DRIVERS No. DIA. No. DIA. No. DIA. 8 30" — 6 42" WHEEL BASE	FIRE	TVBE	7111	Long, Sloping	ING ORDER,	LEADING	10500		METRES	1.435
TENDER TRAILING COUPLED DRIVERS No. DIA. No. DIA. No. DIA. 8 30" — 6 42" WHEEL BASE	ER	AIG	7	ir, 46"	N WORK	DRIVERS	26000	ATE ARE	SQUARE FEET	12.1
TENDER TRAILING COUPLED DRIVERS No. DIA. No. DIA. No. DIA. 8 30" — 6 42" WHEEL BASE	BOIL	TVDE		Crown Ba Wagon To	WEIGHT I	MEELS				664
TENDER TRAILING COUPLED DRIVERS No. DIA. No. DIA. No. DIA. 8 30" — 6 42" WHEEL BASE		ING	DIA.		AGE	TRA	1	SQ. F1	PES	
TENDER TRAILING CO		LEAD	NO.	2	AVER	ENDER	3000	FACE,	ARCH PI	
TENDER TRAILING CO		DRIVERS	DIA.	42″				ING SUF	FIRE BOX	75
TENDER TRAILING NO. DIA. NO. DIA	HEELS	COUPLEI	NO.	9	[7]		, 40,	HEAT	UES	68
8	11	_	DIA.		, BASI	ENGINE	17′-8		FI	
B C C C C C C C C C C C C C C C C C C C		TRAIL	NO.	[WHEEI	RIGID	1′-0″	T		us Coa
B C C C C C C C C C C C C C C C C C C C		NDER				9)″ 1	FUE	KINI	mino
¥ .						DRIVIS				Bitu
ERS A. STROKE LENGTH 9'-0" 9'-1" 1. INCH HERE	S	TOG CO.	AUM 10	22″		NGTH	,,0-,	SURE	NCH	
CYLINDERS Ple 14" FLUES DIA. LENG' 2" 9'-C 2" 9'-C NUS PER SQ. INCA NUS PER SQ. INCA	NDER		. WIW.	14″	UES		0,	PRESS	ER SQ. II	20
CYLINDERS TYPE DIA. STROD FLUES NO. DIA. ELWES NO. DIA. LENGTH 126 2' 9'-0" BOILER PRESSURE POUNDS PER SQ. INCH ABOVE ATMOSPHERE 150	CYLI	TVDE		Simple	FL		126 2″	BOILER	POUNDS PE ABOVE AT	

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE QUINCY & TORCH LAKE RAILROAD.

CODE WORD, QUERENT.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

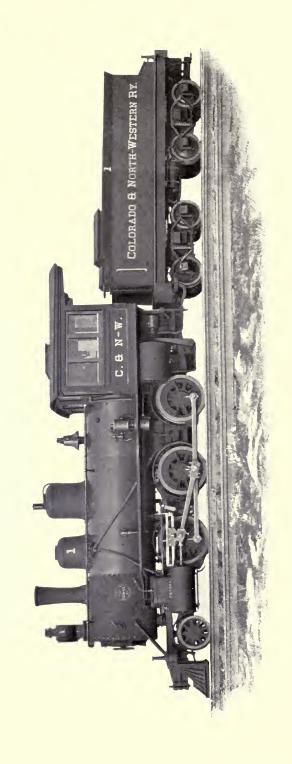
CLASS, 17 B.

SERIES, 537.

TANK CAPACITY 3100 U. S. GALLONS AND 7 TONS FUEL.

		;	I.	>					S	
			LENGIH WIDIH	24	DS	TOTAL	00006	RACK	INCHES	3′-0″
1 6	BOX		LENG	108	Poun	F E	ð	OF T	FEET	ro
	FIKE BOX	Ĺ	2	Long, Wide, 108" 24"	EDER,	ING	00	GAUGE OF TRACK	METRES	.914
		TVDF		Long, Wi	G OF	LEADING	11000		M	
			ċ	58″ 1	ORKIN	7		GRATE AREA	FEET	N
+ 6	۲. ۲.	DIA			N W	DRIVERS	20000	ATE	SQUARE FEET	17.5
1100	BOILER	TVDE		Rad. Stay, Straight Top	HT			GR		
		F	1		AVERAGE WEIGHT IN WORKING ORDER, POUNDS	FRAILING		T.	TOTAL	1164
		NING	DIA.	28″	AGE	TR		SQ. F	PES	-
		LEADING	NO.	0	AVER	TENDER	72000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
		/ERS	DIA.	44″			7.	SUR	BOX	4
	Ω	D DRIV	Ω	4		ENGINE AND TENDER	,9-,8	TING	FIRE BOX	114
TIPET	WHEELS	COUPLED DRIVERS	NO.	9			4	HEA	FLUES	1050
1 3	3		DIA.		WHEEL BASE	ENGINE	-1½" 11'-0" 11'-0" 43'-6"		FL	
1		TRAILING	NO.		HEEL	9	,0			Coal
			DIA.		WE	RIGID	11,-	FUEL	KIND	snou
		TENDER	NO. D	8		DRIVING	,,0-,1	H		Bituminous Coal
		84				Į į	11	[7]		B
000	1KS	avodro				LENGTH		BOILER PRESSURE	INCH	
	CYLINDERS	P. C.	710	17	FLUES		1	PRE	TMOSP	160
7.1.7	CVI	TVPF		Simple 17"	F	DIA.	200 2" 10'	LER	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	
		T	1	-		NO.	200	BOI	PO	
				77						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE COLORADO & NORTH-WESTERN RAILWAY.

CODE WORD, QUERIST.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

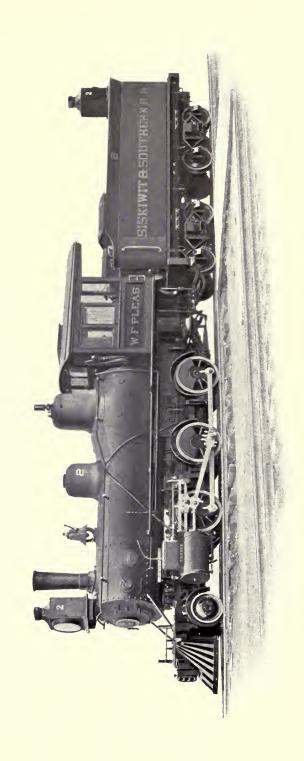
RTH-WESTERN RAILWAY.

SERIES, 624.

CLASS, 15 B. TANK CAPACITY 2000 U. S. GALLONS AND 6 TONS FUEL.

O	CYLINDERS	DERS					WHEELS	STS			B	BOILER		FIRE BOX	BOX	
TYPE		DIA. STROKE		TENDER	TRAI	TRAILING	COUP	COUPLED DRIVERS		LEADING	TUTAL			TO THE PARTY OF TH		
			NO.	DIA.	NO.	DIA.	NO.	DIA.		NO. DIA.		E DIA.	¥.	1 1 P.E.	LENGTH WIDTH	WIDTH
JL	le 1	Simple 15" 22"	∞	8 28″			9	42′′		2 28″	Rad. S Straigh	tay, nt Top 54	r″ Lo	Rad. Stay, Straight Top 54" Long, Wide 84" 24"	84″	24″
	FLUES	S			WHEE	WHEEL BASE	SE		A	VERAG	E WEIGH	T IN WC	RKIN	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pounds	
1	DIA.	LENGTH	DRIVING	S N	RIGID	ENGINE		ENGINE AND TENDER	TENDER	ER	TRAILING	DRIVERS		LEADING	TOTAL	AL
	2,	170 2" 8'-2½" 10'-4" 10'-4" 16'-10" 41'-1"	10′-	4″ 1	0′-4″	16′-1		41'-1"	52000	00		61000		0006	70000	00
1	SR PR	BOILER PRESSURE		FUEL	L		HE	HEATING SURFACE, SQ. FT.	SURFA	CE, SQ.	FT.	GRATE AREA	AREA	GAUGE OF TRACK	OF TR.	ACK
NO SOV	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	Q, INCH		KIND		.4	FLUES	FIRE BOX		ARCH PIPES	TOTAL	SQUARE FEET	FEET	METRES	FEET	INCHES
	165		Bitu	minot	Bituminous Coal		720	88			808	13.5	ıo	.914	3′-0″	,,0

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1895

1080

FOR THE SISKIWIT & SOUTHERN RAILROAD.

CODE WORD, QUERKIN.

CLASS, 15 B.

SERIES, 562.

WITH 8-WHEELED TENDER

81

TYPE, MOGUL FREIGHT.

TANK CAPACITY 2700 U. S. GALLONS AND 6 TONS FUEL.

LENGTH WIDTH 24′ FEET INCHES GRATE AREA GAUGE OF TRACK 00089 TOTAL 3′-0″ AVERAGE WEIGHT IN WORKING ORDER, POUNDS Long, Wide 84" over Frames FIRE BOX METRES .914 LEADING WHEELS 10000 TYPE 20,, SQUARE FEET DIA. 13.6 58000 DRIVERS Crown Bar, Wagon Top BOILER TYPE 780.5 TRAILING TOTAL HEATING SURFACE, SQ. FT. 24″ DIA, TENDER TRAILING COUPLED DRIVERS LEADING ARCH PIPES NO. 56000 TENDER FIRE BOX 85.5 36′ DIA. ENGINE AND 10'-4" 10'-4" 16'-10" 41'-4" TENDER WHEELS NO. 695 FLUES WHEEL BASE ENGINE DLA. Bituminous Coal NO. RIGID FUEL CININ **%** DIA. DRIVING STROKE 8′-2″ LENGTH BOILER PRESSURE FOUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS DIA. Simple 15" FLUES 150 DIA. TYPE 164 ć



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898 FOR THE TIONESTA VALLEY RAILWAY.

CODE WORD, QUERLE.

TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

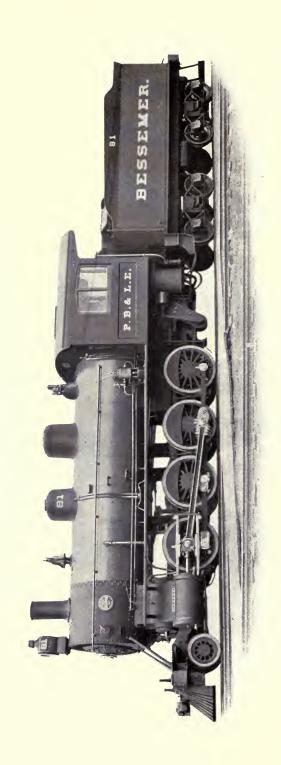
SERIES, 661.

CLASS, 15 B.

TANK CAPACITY 2000 U. S. GALLONS AND 6 TONS FUEL.

						-			
XO		CENGTH WIDTH	78" 24"	OUNDS	TOTAL	28000	F TRACK	FEET INCHES	3′-0″
FIRE BOX		INFE	Long, Wide over Frames	G ORDER, P	LEADING	2000	GAUGE OF TRACK	METRES	.914
BOILER	7		Rad. Stay, S2" Long, Wide Straight Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	51000	GRATE AREA	SQUARE FEET	12.5
B(TVDE		" Rad. St Straigh	E WEIGHT	TRAILING		FT.	TOTAL	829
	LEADING	DIA.	24"	ERAGI			, SQ.	ARCH PIPES	
	LE	NO.	7	AVI	TENDER	50000	REACE	ARCH	
	COUPLED DRIVERS	DIA.	38″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	79
WHEELS	COUPLE	NO.	9		ENGL	39,	HEAT	ES	0
W		DIA.		BASE	ENGINE	15′-9″		FLUES	579
	TRAII ING	NO. D		WHEEL BASE	RIGID	$-5\frac{1}{2}$ " $10'-0$ " $10'-0$ " $15'-9$ " $39'-5\frac{1}{2}$ "	J.	Q	Bituminous Coal
	TENDER	DIA.	792		9	0″ 1	FUEL	KIND	mino
		NO.	∞		DRIVING	10′-			Bitu
SS	AJOGAS	OTHON	18″		LENGTH	-5 <u>1</u>	SURE	NCH	
CYLINDERS	Í	·	15″	FLUES		1	PRESS	K SQ. IN	165
CVLI	TVPF		nple	FL	DIA.	150 2" 7'-	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	=
			E Simple 15"		NO.	150	BOI	PO	
			83						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., US.A.

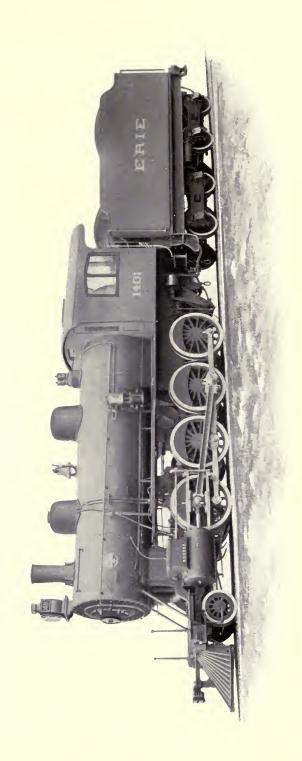
TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

CODE WORD, QUERPO.

FOR THE PITTSBURGH, BESSEMER & LAKE ERIE RAILROAD.

SERIES, 685. CLASS, 22 C. TANK CAPACITY 5000 U. S. GALLONS AND 12½ TONS FUEL.

	LENGTH WIDTH	45″	ñ	FOTAL	179000	RACK	INCHES	4'-8½"
BOX	LENGTH	114″	Pound	TO'ENC	179	OF TR	PERT	4'-
FIRE BOX	TYPE	Long, Wide over Frames	ING ORDER,	LEADING WHEELS	20000	SA GAUGE OF TRACK	METRES	1.435
BOILER	TYPE DIA.	2 30" Rad. Stay, 72" Long, Wide 114" 42"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	159000	GRATE AREA	SQUARE FEET	32.4
		, Rad. Straig	3 WEIGH	TRAILING		FT.	TOTAL	2283
	S LEADING NO. DIA.	2 30	AVERAGI	TENDER	107000	HEATING SURFACE, SQ. FT.	ARCH FIPES	William and American
WHEELS	COUPLED DRIVERS NO. DIA.	8 54"		ENGINE AND TENDER	54′-0″	HEATING SU	S FIRE BON	1 192
WH			WHEEL BASE	ENGINE	23′-9″		FLUES	al 209
		33″ —	WHEE	RIGID	242 24" 14'-94" 15'-4" 15'-4" 54'-0" 54'-0"	FUEL	KIND	Bituminous Coal 2091
	TEN NO.	28" 8 33"		DRIVING	15′-4″	_		Bitumi
ERS	DIA, STROKE	22" 28"	S	LENGTH	$14'-9\frac{1}{4}''$	ESSURE	SQ. INCH SPHERE	
CYLINDERS	TYPE D	Simple Piston 2 Valve	FLUES	NO. DIA.	42 24″	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
		85		X.	(1)	Ã		



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1899

FOR THE ERIE RAILROAD.

CODE WORD, QUESAL.

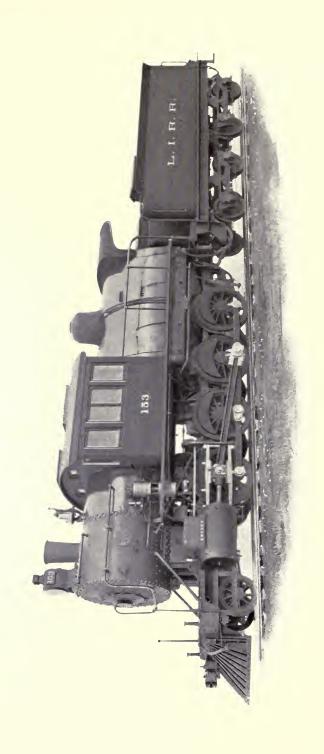
TYPE, CONSOLIDATION FREIGHT.

WITH 8-WHEELED TENDER

Series, 701. Class, 21 C.

TANK CAPACITY 6000 U. S. GALLONS AND 15 TONS FUEL.

		DTH	42″				M	INCHES	
	-	LENGTH WIDTH	4	SOL	TOTAL	170000	RAC		4'-81"
BOX		LENG	120	Pour	— ш	12	OF I	FEET	4
FIRE BOX		TYPE	Wide	RDER,	LEADING	20000	GAUGE OF TRACK	METRES	1.435
	ŧ	TX	68" Long, Wide 120"	ING 0	LEA	20			
~		DIA.		WORK	DRIVERS	150000	GRATE AREA	SQUARE FEET	41.4
BOILER	5	i i	tay, Top	T IN	DR	15	GRA	ıòs	
B		INFE	Rad. Stay, Wagon Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	TRAILING		7.T.	TOTAL	2275
	ING	DIA.	30″	AGE			So. 1	PES	
	LEADING	ON	7	AVER	TENDER	132000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS	DIA.	57"		е.		SUF	FIRE BOX	193
αί	ED DR				ENGINE AND TENDER	3′-6′	TING	FIRE	
WHEELS	OUPLI	NO.	∞		ENG	rv	HEA	ES	32
W	-	DIA.		WHEEL BASE	ENGINE	-2 ³ " 15'-9" 15'-9" 24'-0" 53'-6"	ļ 	FLUES	2082
	TRAILING	NO.		EEL	Ω	,6			Coal
				WI	RIGID	15′-	FUEL	KIND	Bituminous Coal
	TENDER	DIA.	36′′		ING	,,6-	F	Х	ımin
		NO.	∞		DRIVING	15.			Bitt
S	STROKE		28″		LENGTH	-23/	URE	E	
CYLINDERS	DIA.		21″	ES	LEN		BOILER PRESSU	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	
YLIN	7+1		e	FLUES	DIA.	2	R PF	S PER E ATMO	200
C	TYPE		Simple 21"		NO.	304 2" 13'	OILE	POUNI	



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

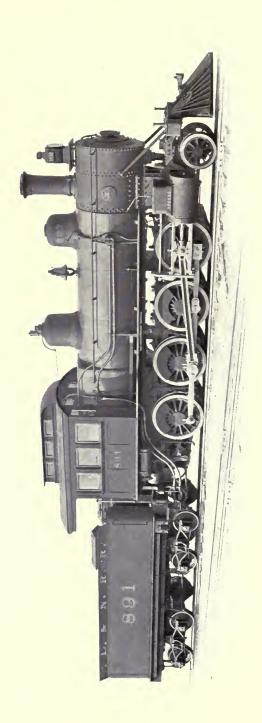
CODE WORD QUESQUE.

SERIES, 677. CLASS, 21 C.

FOR THE LONG ISLAND RAILROAD.

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL. TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

BOX	LENGTH WIDTH	120" 84"	Pounds	TOTAL	155000	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE	Wide over Wheels	NG ORDER,	LEADING	20000		METRES	1.435
BOILER	g DIA	Rad. Stay, Straight Top 72"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	135000	GRATE AREA	SQUARE FEET	69.5
ВО	TYPE	Rad. St Straight	WEIGHT	TRAILING		FT.	TOTAL	1945
	LEADING NO. BIA.	2 30"	AVERAGE	FENDER	86000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
10	COUPLED DRIVERS NO. DIA.	51″		ENGINE AND TENDER		TING SUR	FIRE BOX	172
WHEELS		∞	SASE	ENGINE TE	2'-9" 5(HEA	FLUES	1773
	TENDER TRAILING NO. DIA. NO. DIA.	8 30″ – 8	WHEEL BASE	DRIVING RIGID ES	'-7 ³ " 14'-6" 14'-6" 22'-9" 50'-2"	FUEL	KIND	Anthracite Coal
CYLINDERS	TYPE DIA STROKE	Simple 21" 28"	FLUES	NO, DLA, LENGTH	294 2" 11'-716"	BOILER PRESSURE	POUNDS PER SQ, INCHABOVE ATMOSPHERE	180
		- 89						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S A. BUILT BY

1898 FOR THE LOUISVILLE & NASHVILLE RAILROAD.

SERIES, 668. CLASS, 21 C.

> TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

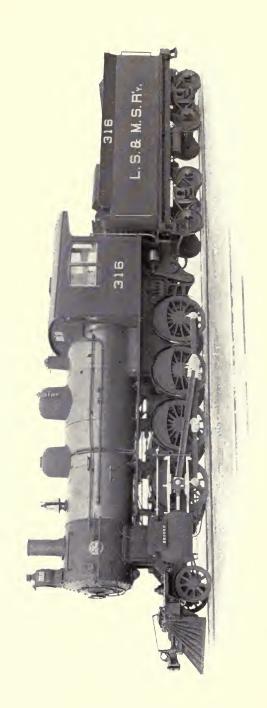
CODE WORD, QUESTANT.

TANK CAPACITY 4200 U. S. GALLONS AND 123 TONS FUEL.

CYLINDERS						WHEELS	STS				BOILER	IR.	FIRE BOX	BOX
	La Contra	TENDER	DER	TRAII	TRAILING	COUP	COUPLED DRIVERS	EKS	LEADING	NG	TVDE	DIA	TVPF	DECOME.
LIFE DIA.	SIKOKE	NO.	DIA.	NO.	DIA.	NO.	. DIA.	,	NO.	DIA.	7111	DIA.	7117	EENGIH WIDI
Simple 21"	26″	∞	33″			∞	55″		61	33" [Improved Belpaire		6515" Long between 1233" 34"	123½" 34"
FLUES			=	HEE	WHEEL BASE	SE			AVER	AGE W	EIGHT IN	WORKI	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pounds
NO, DIA, LENGTH	нт:	DRIVING		RIGID	ENGINE		ENGINE AND TENDER	TEN	TENDER	TRAILING		DRIVERS	LEADING	TOTAL
222 24" 14'-0" 15'-11" 15'-11" 23'-8" 51'-11"	-0,,	15'-11	" 15	-111″	23′-	× × ×	51′-11″	94	94000			139000	17000	156000
BOILER PRESSURE	IRE		FUEL			HIE	HEATING SURFACE, SQ. FT.	SURF	ACE,	So. Ft.	GR	GRATE AREA		GAUGE OF TRACK
POUNDS PER SQ. INCA ABOVE ATMOSPHERE	H .:		KIND			FLUES	FIRE BOX		ARCH PIPES		TOTAL S	SQUARE FEET	METRES	FEET INCHES
170		Bituminous Coal 1820	inous	s Co	al	1820	185	10		72	2005	29.8	1.435	1.435 $^{-}4'-8\frac{1}{2}''$

91

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RALLWAY.

TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

CODE WORD, QUESTMAN.

CLASS, 20½ C. SERIES, 683.

TANK CAPACITY 5000 U. S. GALLONS AND 121 TONS FUEL.

SOX	HEUDA HETAG		114" 42"	SUNDO	TOTAL ENGINE	156500	GAUGE OF TRACK	FEET INCHES	4′-8½″
FIRE BOX	TVPE		Rad. Stay, $64\frac{1}{8}$ Long, Wide Wagon Top over Frames	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	18000		METRES	1.435
BOILER	R DIA		tay, $64\frac{1}{8}$ Top	T IN WORKI	DRIVERS	138500	GRATE AREA	SQUARE FEET	324
B(TVPF			WEIGH	TRAILING WHEELS		FT.	TOTAL	2183
	LEADING	NO. DIA.	2 33"	AVERAGI	TENDER	94000	FACE, Sq.	ARCH PIPES	24
rs	COUPLED DRIVERS	DIA.	26″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	188
WHEELS		DIA. NO.	∞	BASE	ENGINE	'-3" 15'-3" 15'-3" 51'-6"	HE	FLUES	1971
	SR TRAILING	DIA. NO.	33″ –	WHEEL BASE	RIGID	15'-3"	FUEL	KIND	Bituminous Coal 1971
	TENDER	No.	∞		DRIVING	15′-3″			Bitumi
CYLINDERS		DIA. SIRONE	$20\frac{1}{2}$ " 28 "	ES	LENGTH	13	RESSURE	I SQ. INCH IOSPHERE	0
CYLIN	TAVE	3111	Simple $20\frac{1}{2}$ "	FLUES	NO, DIA,	286 2″	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
			93						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1896

FOR THE ST. MARY'S & SOUTHWESTERN RAILROAD.

SERIES, 575.

CLASS, 20 C.

TYPE, CONSOLIDATION FREIGHT. CODE WORD, QUESTOR.

WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

OF THE
UNIVERSITY
OF
CALIFORNIA Long, Wide 1075" 377" LENGTH WIDTH 158750 TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FIRE BOX LEADING WHEELS 16750 TYPE DIA. ,×89 142000 DRIVERS Crown Bar, Wagon Top BOILER TYPE TRAILING 30″ DIA. LEADING 86000 NO. TENDER (1) COUPLED DRIVERS 51″ DIA. ENGINE AND TENDER 50'-4" WHEELS NO. ∞ 22′-8″ WHEEL BASE ENGINE TRAILING DIA. 11'-115" 14'-8" 14'-8" NO. RIGID 33′ NO. DIA. TENDER DRIVING ∞

Simple 20" 95

26′

LENGTH

DIA.

FLUES

STROKE

TYPE

CYLINDERS

INCHES

FEET

METRES

SQUARE FEET

TOTAL

ARCH PIPES

FIRE BOX

FLUES

KIND

POUNDS PER SQ. INCH ABOVE ATMOSPHERE

 $4'-8\frac{1}{2}''$

1.435

28.2

1961

196

1765

Bituminous Coal

8

GAUGE OF TRACK

GRATE AREA

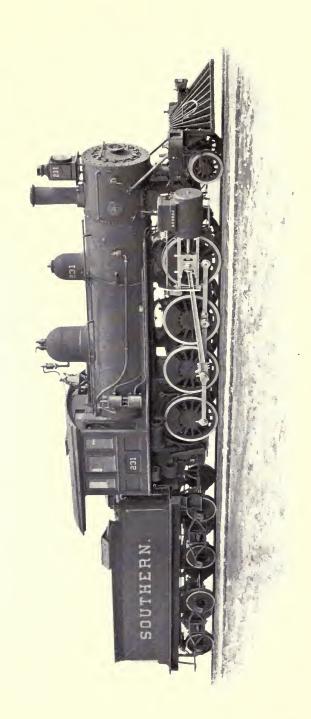
FT.

HEATING SURFACE, SQ.

FUEL

BOILER PRESSURE

308



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1896

TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

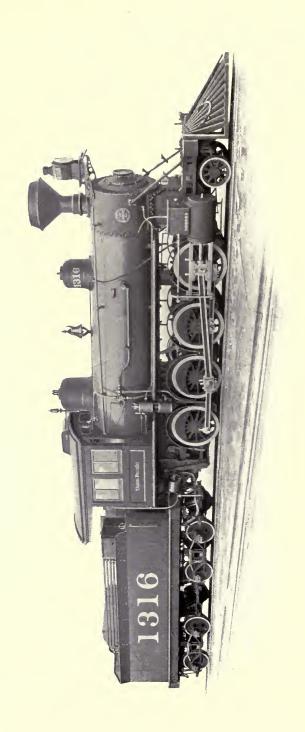
CODE WORD, QUETTE.

SERIES, 582. CLASS, 20 C.

FOR THE SOUTHERN RAILWAY.

TANK CAPACITY 4200 U. S. GALLONS AND 8½ TONS FUEL.

BOX	LENGTH WIDTH	102_{4}^{3} " 41_{Ξ} "	Pounds	TOTAL	140100	GAUGE OF TRACK	FEET INCHES	4′-9″
FIRE BOX	TYPE	Long, Wide Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	20000	A GAUGE	METRES	1.448
BOILER	DIA.	,,09	IN WORKE	DRIVERS	120100	GRATE AREA	SQUARE FERT	30
	TYPE	" Rad. Stay, Wagon Top	E WEIGHT	TRAILING			FOFAL	1827
	LEADING	2 30"	AVERAG	TENDER	86000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
WHEELS	COUPLED DRIVERS NO. DIA.	26″		ENGINE AND TENDER	49′-6″	EATING SU	FIRE BOX	143
	TRAILING COU	%	WHEEL BASE	ENGINE 22'-9½"	$22'-9\frac{1}{2}''$	Н	FEUES	oal 1684
	TENDER	8 33″ —	WHEI	DRIVING	15'-0" 15'-0"	FUEL	KIND	Bituminous Coal
CYLINDERS	E DIA, STROKE	Simple 20" 26"	FLUES	DIA. LENGTH	234 2" 13'-10" 15'-0" 15'-0" 22'-9½" 49'-6"	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	175
J	TYPE	Siml 97		Š.	234	BOIL	POU	



BROOKS LOCOMOTIVE WORKS BUILT BY

DUNKIRK, N. Y., U.S.A.

FOR THE UNION PACIFIC RAILWAY,

CODE WORD, QUEYOR.

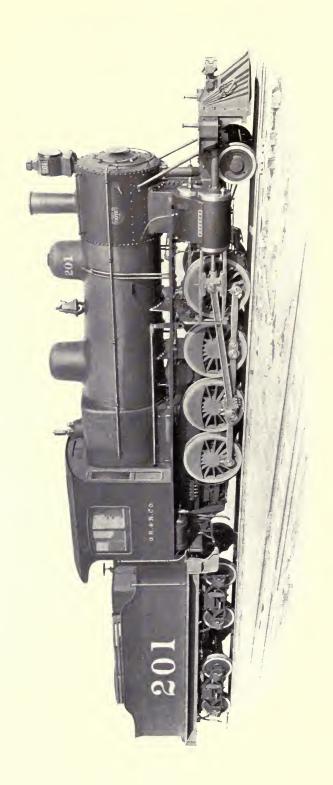
WITH 8-WHEELED TENDER

TYPE, CONSOLIDATION FREIGHT.

TANK CAPACITY 4000 U. S. GALLONS AND 8½ TONS FUEL.

SERIES, 673. CLASS, 20 C.

LENGTH WIDTH 64" Long, Wide 1073" $41\frac{1}{2}$ " FEET INCHES GAUGE OF TRACK 145000 $4'-8\frac{1}{2}''$ ENGINE TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FIRE BOX METRES 1.435 14000 LEADING WHEELS TYPE GRATE AREA SQUARE FEET DIA. 30.3 131000 DRIVERS Crown Bar, Wagon Top BOILER LYPE 2104 TOTAL TRAILING WHEELS HEATING SURFACE, SQ. FT. 28′ DIA. LEADING ARCH PIPES 23 89000 NO. TENDER (1) COUPLED DRIVERS FIRE BOX 51″ DIA. 170 23'-0" 52'-104" ENGINE AND TENDER WHEELS ÖN. ∞ FLUES 1911 WHEEL BASE ENGINE TRAILING DIA. Bituminous Coal 15'-5" 15'-5" NO. RIGID FUEL KIND TENDER DIA. 33′ DRIVING NO. ∞ DIA. STROKE 24′ BOILER PRESSURE 13′-6″ LENGTH POUNDS PER SQ. INCH ABOVE ATMOSPHERE . CYLINDERS 20′′ FLUES 8 DIA. Simple TYPE 272 NO.



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

FOR THE OREGON RAILROAD & NAVIGATION COMPANY.

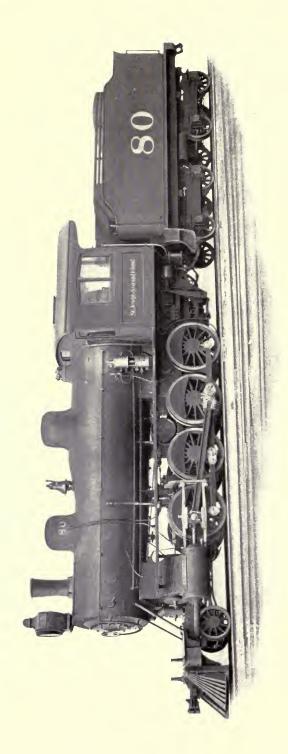
TYPE, CONSOLIDATION FREIGHT. CODE WORD, QUIBBLE.

WITH 8-WHEELED TENDER

CLASS, 19 C. TANK CAPACITY 4500 U. S. GALLONS AND 121 TONS FUEL.

SERIES, 674.

BOX	темети міртн	114" 42"	Pounds	TOTAL	154000	GAUGE OF TRACK	FEET INCHES	1.435 $4'-8\frac{1}{2}''$
FIRE BOX	TYPE	64" Long, Wide 114" 42"	NG ORDER,	LEADING WHEELS	17800	A GAUGE	METRES	1.435
BOILER	E DIA.		AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	136200	GRATE AREA	SQUARE FEET	32
BC	TYPE	// Improved Belpaire	E WEIGHT	TRAILING		. Ft.	TOTAL	2162
	LEADING NO. DIA.	2 30"	AVERAG	TENDER	103000	RFACE, SQ	ARCH TIPES	22
ELS	COUPLED DRIVERS NO. DIA.	55"	WHEEL BASE	ENGINE AND TENDER	$51'-8\frac{3}{4}''$	HEATING SURFACE, SQ. FT.	FIRE BOX	182
WHEELS	TRAILING COU			ENGINE	23'-2"		FICES	oal 1958
	TENDER TRA	8 33″ —	WHE	DRIVING RIGID	-2 [‡] " 14'-6" 14'-6" 23'-2" 51'-8 [‡] " 103000	FUEL	KIND	Bituminous Coal 1958
CYLINDERS	DIA, STROKE	19" 30"	FLUES	LENGTH		BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	200 H
CYL	TYPE	Simple Piston Valve	<u> </u>	- NO, DIA.	286 2″ 13	BOILER	POUNDS P	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE ST. JOSEPH & GRAND ISLAND RAILWAY.

1899

SERIES, 694.

CLASS, 19 C.

TYPE, CONSOLIDATION FREIGHT. CODE WORD, QUICA.

WITH 8-WHEELED TENDER

TANK CAPACITY 4500 U. S. GALLONS AND 81 TONS FUEL.

BOX	LENGTH] WIDTH	114" 42"	Pounds	TOTAL ENGINE	152000	OF TRACK	FEET INCHES	1.435 $4'-8\frac{1}{2}''$
FIRE BOX	TYPE	Long, Wide	ING ORDER,	LEADING	17000	GRATE AREA GAUGE OF TRACK	METRES	1.435
BOILER	TYPE DIA.	Rad. Stay, Wagon Top 66" Long, Wide 114" 42"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	135000	GRATE AR	SQUARE FEET	32
		0" Rad. Wago	GE WEIGI	TRAILING		2. FT.	TOTAL	2258
	LEADI NO.	2 30"	AVERA	TENDER	95000	RFACE, S	ARCH PIPES	
FS	COUPLED DRIVERS NO. DIA.	54"		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	162
WHEELS		S	BASE	ENGINE	23'-2"	IIE	FLUES	2096
	DER TRAILING DIA. NO. DIA.	3″	WHEEL BASE	RIGID	-2 1 6" 14'-6" 14'-6" 23'-2" 51'-3"	FUEL	KIND	Bituminous Coal
	TEN NO.	30" 8 33"		DRIVING	14′-6″			Bitumin
CYLINDERS	DIA, STROKE	19″ 30″	FLUES	LENGTH	13,	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	00
CYLII	TYPE	Simple Piston Valve	FL	NO. DIA.	306 2"	BOILER F	POUNDS PE ABOVE ATT	200
		103						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

CODE WORD, QUICKEN.

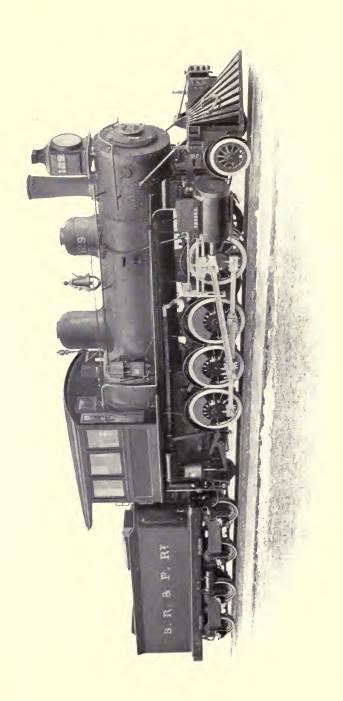
SERIES, 482.

CLASS, B¹³/₂ C.

FOR THE GREAT NORTHERN RAILWAY.

TANK CAPACITY 4000 U. S. GALLONS AND 8 TONS FUEL. TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

FIRE BOX	LENGTH WIDTH	114" 32"	Pounds	TOTAL	147000	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE	TYPE	Long	G ORDER,	LEADING	17000		METRES	1.435
BOILER	DIA.	ed 63"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	130000	GRATE AREA	SQUARE FFET	25.3
BOI	TYPE	Improved Belpaire	E WEIGHT	TRAILING			TOTAL	1596
	LEADING NO. DIA.	2 30"	AVERAGI	TENDER	85000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
LS	TRAILING COUPLED DRIVERS NO. DIA. NO. DIA.	55"		ENGINE AND TENDER		ATING SUF	FIRE BOX	177
WHEELS	ILING COUPI	∞	BASE	ENGINE	208 24" 11'-7" 15'-6" 15'-6" 23'-0" 50'-0"	HE	FLUES	1419
			WHEEL BASE	RIGID	15'-6"	FUEL	KIND	Biruminous Coal 1419
	STROKE NO. DIA.	26" 8 33"		DRIVING	15′-6″			Bitumi
CYLINDERS	DIA. STR		FLUES	DIA. LENGTH	11'-7'	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
CVI	TYPE	Tandem 13" Compound 22"	F	NO. DI	208 2	BOILER	POUNDS ABOVE A	
		105						



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

FOR THE BUFFALO, ROCHESTER & PITTSBURG RAILWAY.

TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

CODE WORD, QUICKSET.

TANK CAPACITY 3900 U. S. GALLONS AND 61/2 TONS FUEL.

SERIES, 519.

CLASS, 18 C.

LENGTH WIDTH 33″ FEET INCHES GAUGE OF TRACK $4'-8\frac{1}{2}''$ 128000 TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS 108′′ FIRE BOX METRES 1.435 LEADING WHEELS 13000 Long TYPE GRATE AREA SQUARE FEET DIA. 28, 115000 DRIVERS 24 BOILER Improved Belpaire TYPE 1625.7 TRAILING TOTAL HEATING SURFACE, SQ. FT. 30″ NO. DIA. LEADING ARCH PIPES 15.7 78000 TENDER 0 TENDER TRAILING COUPLED DRIVERS FIRE BOX , 84 DIA. 158 ENGINE AND 13'-4" 13'-4" 20'-10" 47'-10" TENDER WHEELS ć. ∞ FLUES Bituminous Coal 1452 WHEEL BASE ENGINE NO. DIA. RIGID FUEL KIND NO. DIA. 8 33" DRIVING DIA. STROKE Simple 18" 26" 2" 13'-2" BOILER PRESSURE DIA, LENGTH POUNDS PER SQ, INCH ABOVE ATMOSPHERE CYLINDERS FLUES 180 TYPE 212 $\frac{-}{107}$



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE MINNEAPOLIS, ST. PAUL & ASHLAND RAILWAY.

CODE WORD, QUICKSTEP.

SERIES, 696. CLASS, 18 C.

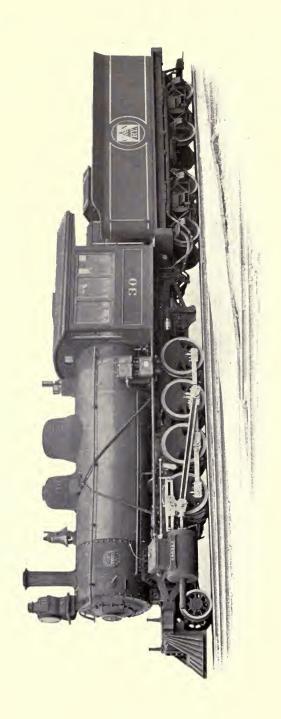
WITH 8-WHEELED TENDER

109

CONSOLIDATION LOGGING.

TANK CAPACITY 4000 U. S. GALLONS AND 91 TONS FUEL.

LENGTH WIDTH $107\frac{3}{16}$ " $32\frac{3}{8}$ " PEET INCHES GAUGE OF TRACK 130800 ENGINE TOTAL. AVERAGE WEIGHT IN WORKING ORDER, POUNDS FIRE BOX 1.435 METRES Long, Sloping 12000 LEADING WHEELS TYPE GRATE AREA SOUARE FEET 58′ DIA. 24.3 118800 DRIVERS Rad. Stay, Wagon Top BOILER TYPE 1807 TRAILING TOPAL WHEELS HEATING SURFACE, SQ. FT. 30″ DIA. LEADING ARCH PIPES 90006 TENDER COUPLED DRIVERS FIRE BOX DIA. 50″ 150 ENGINE AND TENDER 13'-10¹/₈" 14'-6" 14'-6" 22'-1" 48'-1" WHEELS NO. ∞ 1657 FLUES ENGINE WHEEL BASE TRAILING NO. DIA. Bituminous Coal RIGID FUEL KIND NO. DIA. 33″ TENDER DRIVING ∞ DIA. STROKE **2**6′′ BOILER PRESSURE LENGTH POUNDS PER SQ, INCH ABOVE ATMOSPHERE CYLINDERS 18 FLUES <u>8</u> , '2 DIA. Simple TYPE 230



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898

TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

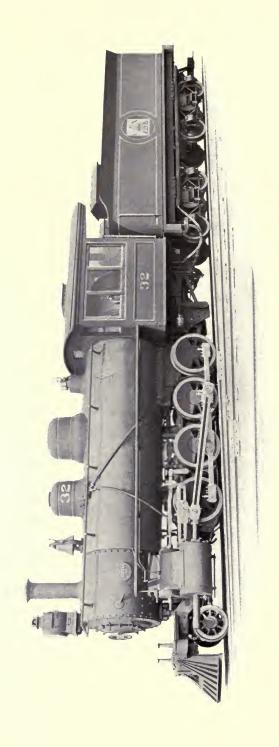
CODE WORD, QUIDAM.

FOR THE COLORADO & NORTHWESTERN RAILWAY.

TANK CAPACITY 3100 U. S. GALLONS AND 7 TONS FUEL.

CLASS, 16 C. SERIES, 656.

		_						20	
BOX		LENGTH WIDTH	120" 24"	Pounds	TOTAL	94500	GAUGE OF TRACK	FEET INCHES	3′-0″
FIRE BOX	TVDE	IILE	58" Long, Wide 120" 24"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	8500		METRES	0.9144
3R	DIA	DIA.	p 58″	N WORKI	DRIVERS	86000	GRATE AREA	SQUARE FEET	19.3
BOILER	TVDE	TILE	Rad. Stay, Wagon Top	WEIGHT I	FRAILING WHEELS.			TOTAL	1289
	NG	DIA.	24″	IGE 1	TRA	I	iq. Ft		
	LEADING	NO.	2	AVER	TENDER	00029	FACE, S	ARCH PIPES	
	COUPLED DRIVERS	DIA.	37"		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	130
WHEELS	OUPLED	NO.	∞		ENGIN	43′	HEAT	ES	1159
WI		DIA.		WHEEL BASE	ENGINE	18′-4″		FLUES	
	TRAILING	NO.		WHEEI	RIGID	-1 ¹ / ₈ " 10'-8" 18'-4" 43'-9"	T	Q	Bituminous Coal
7. 100	TENDER	DIA.	28″		NG	8″	FUEL	KIND	mino
		NO.	∞		DRIVING	10′-			Bitu
RS	TAOGES		, 20″		LENGTH)'-1 ¹ / ₈ "	SSURE	INCH	
CYLINDERS	ā	VIII	16″	TLUES		2″ 16	PRES	PER SQ.	180
CVL	TVPF		Simple Piston Valve	FI	NO. DIA.	221 2	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	
		11			4	71	B		



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

1898

FOR THE COLORADO & NORTHWESTERN RAILWAY.

SERIES, 648.

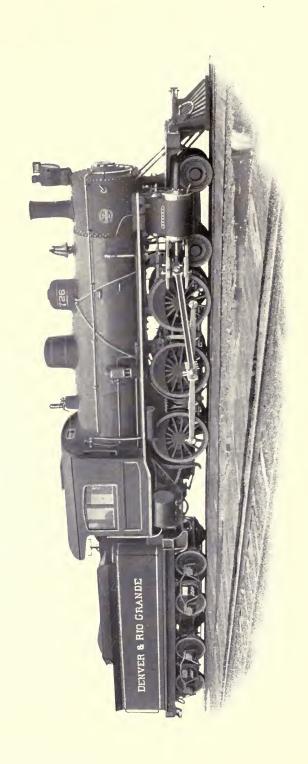
CLASS, 16 C.

TYPE, CONSOLIDATION FREIGHT. WITH 8-WHEELED TENDER

CODE WORD, QUIDDIT.

TANK CAPACITY 3100 U. S. GALLONS AND 7 TONS FUEL.

	BOX	LENGTH WIDTH		120" 24"	Pounds	TOTAL	95000	OF TRACK	FEET INCHES	3′-0″
	FIRE BOX	TVPE		Rad. Stay, Wagon Top 58" Long, Wide 120" 24"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	0006	GRATE AREA GAUGE OF TRACK	METRES	0.9144
1	BOILER	E DIA		ay, Top 58"	IN WORK	DRIVERS	86000	GRATE ARI	SQUARE FEET	19.3
	BO	TVPF			E WEIGHT	TRAILING			TOTAL	1289
		LEADING	NO. DIA.	2 24"	AVERAG	TENDER	00029	RFACE, SQ.	ARCH PIPES	
	ELS	TRAILING COUPLED DRIVERS	. DIA.	37"		ENGINE AND TENDER	43′-9″	HEATING SURFACE, SQ. FT.	FIRE BOX	130
	WHEELS	LING COUL	DIA. NO.	∞ 	WHEEL BASE	ENGINE	18′-4″	H	FLUES	al 1159
		TENDER TRAI	NO. DIA. NO.	8 28″	WHEE	DRIVING	10'-8" 10'-8"	FUEL	KIND	Bituminous Coal
	CYLINDERS		LIFE DIA SIKONE	E Simple 16" 20"	FLUES	NO, DIA, LFNGTH	221 2" $10'-1\frac{1}{8}$ " $10'-8$ " $10'-8$ " $18'-4$ " $43'-9$ "	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
				113						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1899

FOR THE DENVER & RIO GRANDE RAILROAD.

CODE WORD, QUIDDLE.

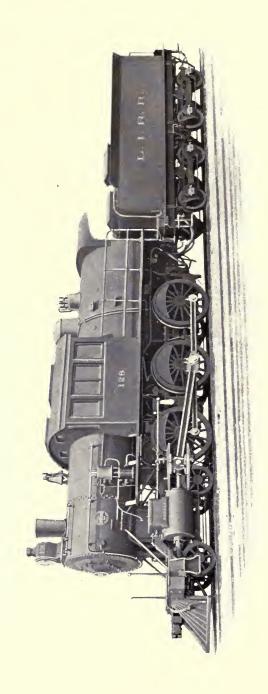
TYPE, 10-WHEELED PASSENGER.

CLASS, 21 D. SERIES, 698.

WITH 8-WHEELED TENDER

TANK CAPACITY 5500 U. S. GALLONS AND 10 TONS FUEL.

BOX		TENCTH WINTH		121" 41"	Pounds	TOTAL	160000	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX		TVPE		Long, Wide 121" 41"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	36000		METRES	1.435
2		DIA		,,89	WORKE.	DRIVERS	124000	GRATE AREA	SQUARE FEET	33.5
BOILER		TVPE		Rad. Stay, Wagon Top	WEIGHT IN	TRAILING 1	1		TOTAL	2422
	1 0	5	DIA.	33″	AGE	TR		30. F		-
	1	LEADING	NO.	4	AVER	TENDER	15000	RACE, S	ARCH PIPES	
	- Outdies	COUPLED DRIVERS	DIA.	63″			$3\frac{13}{16}$ " 13'-0" 13'-0" 23'-7" 53'-10 $\frac{3}{4}$ " 115000	HEATING SURFACE, SQ. FT.	FIRE BOX	165
WHEELS		FLED	NO.	9		ENGINE AND TENDER	53'-1	IEAT		
WHI					SASE	ENGINE	3'-7"	Ţ	FLUES	2257
		IKAILING	NO. DIA.		31. 18	<u> </u>	23			oal
	-	IKA			WHEEL BASE	RIGID	13′-0″	EL	a	Bituminous Coal 2257
		IENDER	DIA.	38′				FUEL	KIND	nino
			NO.	8 38″		DRIVING	13′-0			Bitur
		STROUTE	NOW IS	26″		HAS	313"	JRE	Η	
CYLINDERS		1111		21″	ES	LENGTH	13′-	RESSU	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	0
VLIN		r-			FLUES	DIA.	2,	SR PI	DS PER	210
C		TVPF	1111	Simple Piston Valve		, o N	326 2"	BOILER PRESSURE	POUNI	
				115			-			



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., US.A. 1899

FOR THE LONG ISLAND RAILROAD.

WITH 8-WHEELED TENDER

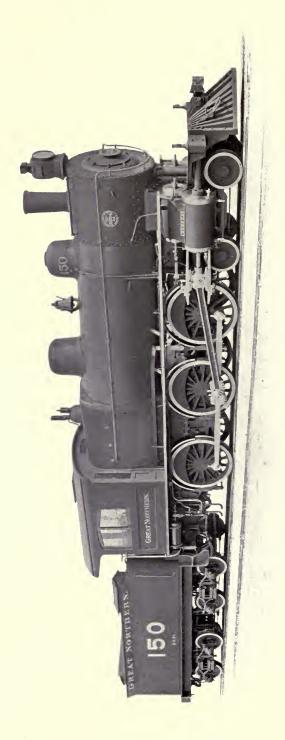
TYPE, 10-WHEELED FREIGHT. CODE WORD, QUIDNUNC.

TANK CAPACITY 4000 U. S. GALLONS AND 8½ TONS FUEL.

SERIES, 692. CLASS, 21 D.

	NIDTH	84″		T. SEE	00	CK	INCHES	\$ E
BOX	LENGTH WIDTH	120″ 84″	Pounds	TOTAL	151000	OF TRA	FEET	4'-8½"
FIRE BOX	TYPE	Wide over Wheels	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	36000	A GAUGE OF TRACK	METRES	1.435
CER	DIA.	t $66\frac{1}{8}$ "	IN WORK	DRIVERS	115000	GRATE AREA	SQUARIC FEET	69.5
BOILER	TYPE	Straight	WEIGHT	TRAILING WHEELS			TOTAL	2030
	LEADING NO. DIA.	4 30"	AVERAGE	TENDER	00006	HEATING SURFACE, SQ. FT.	ARCH FIPES	
ELS	COUPLED DRIVERS NO. DIA.	$^{''}_{2}$ 09		ENGINE AND TENDER	51′-1″	EATING SU	FIRE BOX	141
WHEELS		9	BASE	ENGINE	23′-5″	H	FLUES	1889
-	TENDER TRAILING NO. DIA. NO. DIA.	8 33" —	WHEEL BASE	DRIVING RIGID	$-4\frac{3}{16}$ " 13'-0" 6'-6" 23'-5" 51'-1"	FUEL	KIND	Fine Anthracite Coal
CYLINDERS	TYPE DIA, STROKE,	Simple 21" 26"	FLUES	NO, DIA, LENGTH I	$272 2'' 13' - 4\frac{3}{16}'' 1$	BOLLER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
	,	117		ž.	73	B(

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE GREAT NORTHERN RAILWAY.

CODE WORD, QUIESCE.

TYPE, 10-WHEELED PASSENGER.

WITH 8-WHEELED TENDER

SERIES, 654.

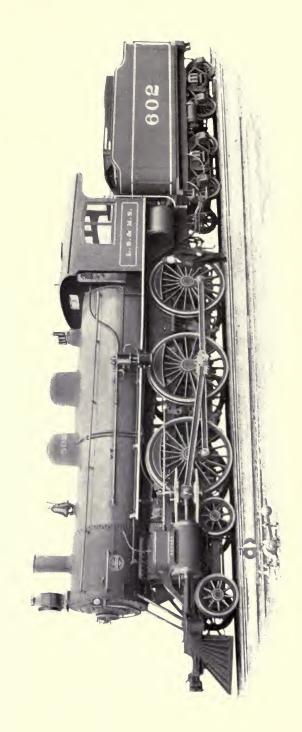
CLASS, 20 D.

TANK CAPACITY 4500 U. S. GALLONS AND 81 TONS FUEL.

 $41\frac{1}{4}$ LENGTH WIDTH INCH1.S GAUGE OF TRACK $4'-8\frac{1}{2}''$ 000991 TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FEET FIRE BOX Long, Wide Sloping 1.435 METRES LEADING WHEELS 36500 TYPE GRATE AREA SQUARE FEET DIA. 129500 35.4 DRIVERS BOILER Improved Belpaire TYPE 2677 TRAILING TOTAL HEATING SURFACE, SQ. FT. 30″ DIA. LEADING ARCH PIPES 24 00006 NO. TENDER TRAILING COUPLED DRIVERS TIRE BOX 63″ DIA. 201 ENGINE AND 53′-6″ TENDER WHEELS o'N 9 2452 FLUES 25′-4″ WHEEL BASE ENGINE DIA. Bituminous Coal 14′-6″ NO. RICID FUEL KIND 33″ DIA, TENDER 24" 13'-104" 14'-6" DRIVING NO. ∞ STROKE 30″ BOILER PRESSURE LENGTH POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS 20″ FLUES 210 DIA. Simple Piston Valve TYPE 303

FOR HAULING CAPACITY SEE PAGE 290.

ND.



THE HEAVIEST EXPRESS PASSENGER LOCOMOTIVE EVER BUILT

BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

October, 1899.

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

CODE WORD, QUIET.

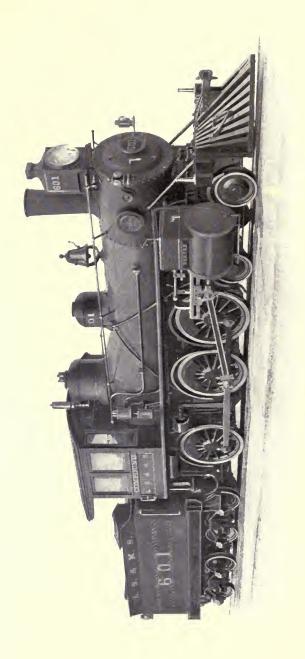
TYPE, 10-WHEELED EXPRESS PASSENGER.

WITH 8-WHEELED TENDER

SERIES, 720. CLASS, 20 D.

TANK CAPACITY 5000 U. S. GALLONS AND 9½ TONS FUEL.

	page .							
BOX	LENGTH WIDTH	121" 41"	Pounds	TOTAL	171,600	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE	66" Long, Wide, 121" 41"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	38600		METRES	1.435
	DIA.	, 66″ S	WORKIN	DRIVERS	133000	GRATE AREA	SQUARE FEET	33.6
BOILER	TYPE	Rad. Stay, Wagon Top	WEIGHT IN	TRAILING I	13		TOTAL SG	2917
LEADING	NO. DIA.	4 36"	AVERAGE	TENDER W	112000	HEATING SURFACE, SQ. FT.	ARCH PIPES	32
VHEELS COUPLED DRIVERS	DIA.	,,08		ENGINE AND TENDER		ING SURF	FIRE BOX	191
>	NO.	9	ASE	ENGINE ENGIN	'-4" 55'.	HEAT	FLUES	2694
TRAILING	NO. DIA.		WHEEL BASE	RIGID EN	3'-6" 27	T		1s Coal
TENDER	NO. DIA.	8 36"		DRIVING	15'-0\}" 16'-6" 16'-6" 27'-4" 55'-2\frac{1}{4}"	FUEL	KIND	Bituminous Coal
DERS	DIA, STROKE	20″ 28″	ES	LENGTH	$15'-0^{1/4}$	RESSURE	SQ, INCH OSPHERE	
CYLINDERS	TYPE	Simple 20"	FLUES	NO, DIA.	345 2"	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	210



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1893

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

CODE WORD, QUIETUS.

TYPE, 10-WHEELED FREIGHT.

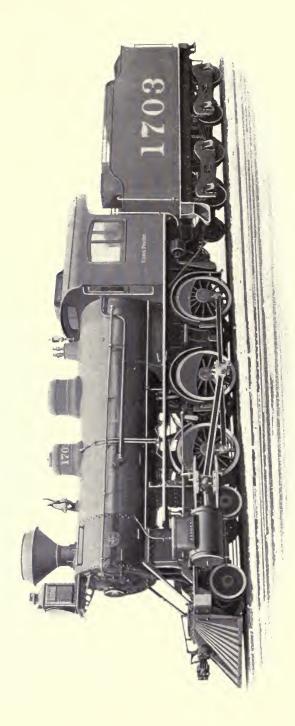
WITH 8-WHEELED TENDER

TANK CAPACITY 3700 U. S. GALLONS AND 7 TONS FUEL.

Series, 489. Class, $A_{\frac{1}{2}\frac{8}{8}}^{\frac{1}{2}}$ D.

BOX	LENGTH WIDTH		96" 34½"	Pounds	TOTAL	105000	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TVPE		Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	25000		METRES	1.435
R	DIA		52"	WORKIN	DRIVERS	00008	GRATE AREA	SQUARE FEET	23.0
BOILER	TVPE		Crown Bar, Wagon Top	WEIGHT IN	FRAILING I WHEELS			TOTAL	1298
	LEADING	DIA.	28″	VERAGE		00	HEATING SURFACE, SQ. FT.	ARCH PIPES	1298
		DIA. NO.	56" 4	A	TENDER	78000	SURFA		112
WHEELS	COUPLED DRIVERS	NO. D	9		ENGINE AND TENDER	-0_{16}^{-1} " 13'-3" 8'-0" 23'- $1\frac{1}{2}$ " 45'- $6\frac{1}{2}$ "	IEATING	FIRE BOX	
WHI		DIA. N		WHEEL BASE	ENGINE	$23'-1\frac{1}{2}''$		FLUES	Bituminous Coal 1168
	TRAILING	NO.		WHEEL	RIGID	8′-0″	FUEL	KIND	ons Cos
	TENDER	NO. DIA.	8 33″		DRIVING	13'-3"	FU	KI	Bitumin
cks		L. STROKE	24″		LENGTH		SSURE	. INCH HERE	
CYLINDERS		DIA.	18″ H	FLUES	DIA.	2" 12'	PRE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
CYI		TYPE	2 Cyl. 18" #. P. Compound 28\frac{1}{2}" L.P.	Ŧ.	on o	186 2″	BOILER PRESSURE	POUNDS	
			123						

FOR HAULING CAPACITY SEE PAGE 290.



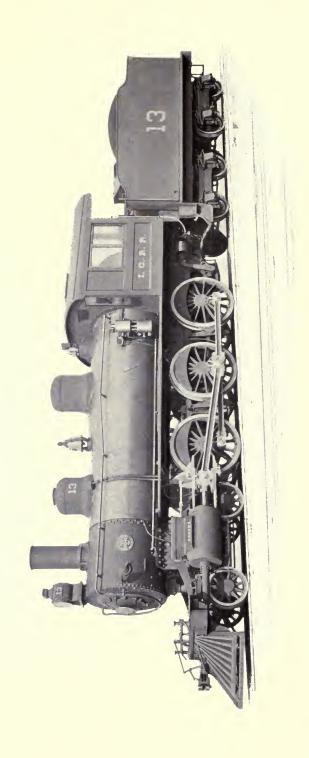
BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A. BUILT BY

FOR THE UNION PACIFIC RAILROAD.

WITH 8-WHEELED TENDER TYPE, 10-WHEELED FREIGHT. CODE WORD, QUILL.

CLASS, 20 D. SERIES, 700. TANK CAPACITY 5000 U. S. GALLONS AND 121 TONS FUEL.

30X	LENGTH WIDTH		114" 41"	Pounds	TOTAL	165000	GAUGE OF TRACK	PERT INCHES	4'-8½"
FIRE BOX	TYPE		Long, Wide	NG ORDER,	LEADING	35000		METRES	1.435
BOILER	PE DIA		30" Crown Bar, 68" Long, Wide 114" 41"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	130000	GRATE AREA	SQUARE FEET	31.3
B	IG TVPE	DIA.	00" Crown	GE WEIGH	TRAILING		Q. Fr.	S TOTAL	2574
	LEADING	NO.	4	AVERA	TENDER	102000	JRFACE, S	ARCH PIPES	20
ELS	COUPLED DRIVERS	, DIA,	. 57″		ENGINE AND TENDER	52'-43"	HEATING SURFACE, SQ. FT.	FIRE BOX	211
WHEELS		DIA. NO.	9	BASE	ENGINE	24′-9″	H	FLUES	11 2343
	R TRAILING	DIA. NO.		WHEEL BASE	RIGID	14'-6"	FUEL	KIND	Bituminous Coal
	TENDER	NO.	28" 8 33"		DRIVING	14′-6″	Ā	*	Bitumin
CYLINDERS		DIA. STROKE		FLUES	LENGTH	342 2" 13'-2\frac{2}{8}" 14'-6" 14'-6" 24'-9" 52'-4\frac{1}{2}"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	200
CYLIN		TYPE	Simple 20"	FLI	NO. DIA.	342 2"	BOILER I	POUNDS PE ABOVE AT	72
			125						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE ILLINOIS CENTRAL RAILROAD.

CODE WORD, QUILLETOR.

TYPE, 10-WHEELED FREIGHT.

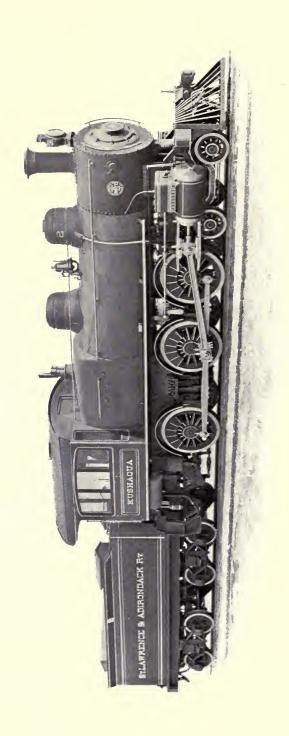
WITH 8-WHEELED TENDER

CLASS, 20 D.

TANK CAPACITY 5000 U. S. GALLONS AND 91 TONS FUEL.

SERIES, 669.

BOX		LENGTH WIDTH	$121'' 33\frac{1}{2}''$	Pounds	TOTAL	155000	GAUGE OF TRACK	FEET INCHES	4'-81"
FIRE BOX		TAPE	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	32000		METRES	1.435
2		DIA.	,,99	WORKI	DRIVERS	123000	GRATE AREA	SQUARE FEET	27.2
BOILER		TYPE	Rad. Stay, Wagon Top	HGHT IN		12	GR		10
	NG	DIA.	33" Ra	AGE WE	TRAILING		50. FT.	3S TOTAL	2401
	LEADING	NO.	4	AVER	TENDER	102000	FACE,	ARCH PIPES	
	COUPLED DRIVERS	DIA.	63″				HEATING SURFACE, SQ. FT.	FIRE BOX	197
WHEELS	COUPLED	NO.	9	田	E TENDER	-0" 13'-6" 13'-6" 24'-4" 51'-3"	HEAT	FLUES	2204
	TRAILING	DIA.		WHEEL BASE	ENGINE	24′-4		ĬT.	oal 2
	-	DIA. NO.	36″ —	WHE	RIGID	13′-6″	FUEL	KIND	Bituminous Coal
	TENDER	NO.	∞		DRIVING	13′-6″	F		Bitumi
CRS		STROKE	782		LENGTH	4′-0″	SSURE	INCH HERE .	-
CYLINDERS		E DIA.	Simple 20"	FLUES	DIA.	2″ 1	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
	direct	IYFE	dwiS		NO.	304 2"	BOILI	POUN	
			141						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE ST. LAWRENCE & ADIRONDACK RAILWAY.

CODE WORD, QUILTED.

SERIES, 578.

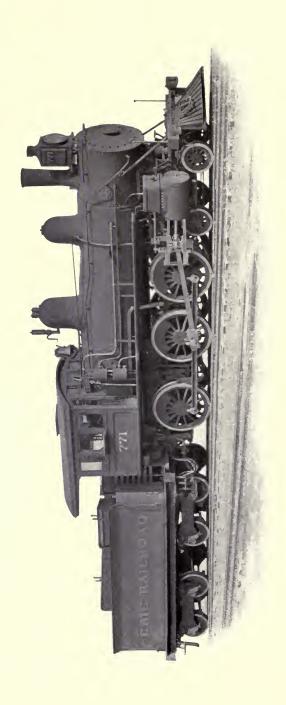
TYPE, 10-WHEELED PASSENGER.

CLASS, 20 D.

WITH 8-WHEELED TENDER

TANK CAPACITY 4500 U. S. GALLONS AND 8½ TONS FUEL.

LENGTH WIDTH		$113'' 40\frac{1}{2}''$	Pounds	TOTAL	154000	OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
		ong, Wide	VG ORDER, I	LEADING WHEELS	28000		METRES	1.435
DIA		64″	WORKIN	RIVERS	26000	ATE ARE	QUARE FEET	32.0
TVPE		Improved Belpaire	VEIGHT IN		1			2016
NG	DIA.	78″	AGE 1	TRA		SQ. FT		
LEADI	NO.	4	AVER	ENDER	0000	FACE,	ARCH PIP	24
DRIVERS	DIA.	57″				ING SUR	FIRE BOX	168
COUPLED	NO.	9	[7]		, 52′-	HEAT	LES	324
	DIA.		BASI	ENGINE	24′-8		F	18 18
TRAII	NO.		WHEEI	RIGID	4′-6″	T		Bituminous Coal 1824
NDER	DIA.	33″			1	FUE	KINI	mino
	NO.	∞		DRIVIN	14′-6			Bitu
				ENGTH	2'-74"	SURE	INCH	
	DIA.	20′	LUES		-	PRES		195
TVDE	1115	Simple	FI		278 2	SOILER	POUNDS ABOVE A	
	TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA TYPE	NDER TRAILING COUPLED DRIVERS LEADI DIA. NO. DIA. NO. DIA. NO.	e 20" 26" 8 33" — 6 57" 4 28" Erading CoupleD Drivers Leading Type DIA. Type CoupleD Drivers Leading Type DIA. Type	STROKE NO. DIA. DIA. DIA. DIA. DIA. DIA. DIA. DIA	TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. TYPE D	STROKE No. DIA. DIA. No. N	E Dia. Stroke According Coupled Drivers Leading Type Dia. Type Dia. Type	Dia. Stroke Dia. Ordered Drivers Leading Type Dia. Dia. No. Dia. D



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A. 1896

TYPE, 10-WHEELED PASSENGER.

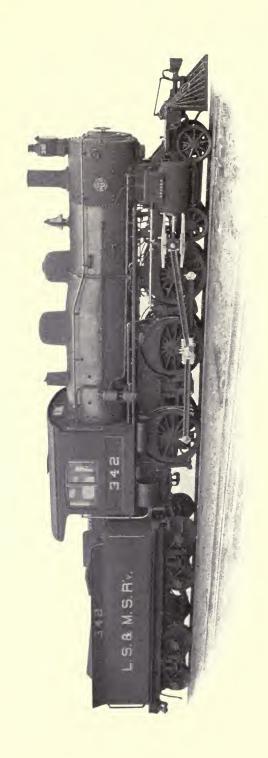
CODE WORD, QUINATE.

FOR THE ERIE RAILROAD.

CLASS, 20 D. SERIES, 586.

TANK CAPACITY 4500 U. S. GALLONS AND 81 TONS FUEL. WITH 8-WHEELED TENDER

×	LENGTH WIDTH	$\frac{1}{8}$ " $40\frac{1}{4}$ "	INDS	TOTAL ENGINE	144750	TRACK	ET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE LENG	, Wide 107	ORDER, Pou	LEADING WHEELS	36750	GAUGE OF TRACK	METRES FEET	1.435
LER	DIA. TY	Rad. Stay, Wagon Top 64" Long, Wide 107_8 " 40_1^1 "	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS W	108000	GRATE AREA	SQUARE FRET	29.7
BOILER		," Rad. Sta Wagon T	E WEIGHT	TRAILING WHEELS			TOTAL	2052
	LEADING NO. DIA.	4 30"	AVERAG	TENDER	93000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
ELS	COUPLED DRIVERS NO. DIA.	62″		ENGINE AND TENDER	20′-6″	EATING SU	FIRE BOX	121
WHEELS		9	WHEEL BASE	ENGINE	24'-2"	Н	FLUES	al 1931
	TENDER TRAILING NO. DIA. NO. DIA.	8 36″ –	WHEE	DRIVING RIGID	'-2" 13'-6" 13'-6" 24'-2" 50'-6"	FUEL	KIND	Biruminous Coal 1931
CYLINDERS	DIA. STROKE	20″ 26″	FLUES	LENGTH		BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
CYLL	TYPE	Simple 20"	FLI	NO, DIA.	282 2" 13	BOILER 1	POUNDS PE ABOVE AT	a
		131						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

TYPE, 10-WHEELED FREIGHT. CODE WORD, QUINCE.

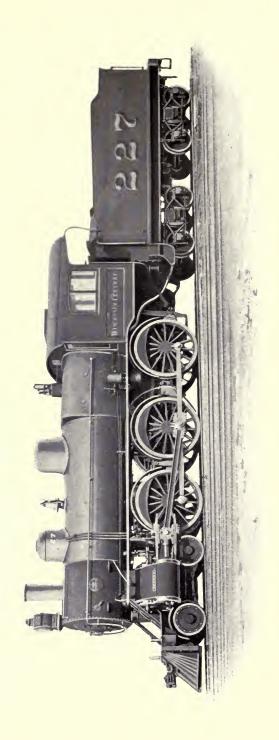
WITH 8-WHEELED TENDER

CLASS, 19½ D.

SERIES, 684.

TANK CAPACITY 5000 U. S. GALLONS AND 10 TONS FUEL.

	THE COLUMN TO SERVICE AND ADDRESS OF THE COLUMN	WILLIAM I	42″	S	FOTAL	154000	RACK	INCHES	4'-8½"
BOX	LENGTH WIDTH		114″	Pound	TO	154	OF TF	FEET	-,4
FIRE BOX	TYPE		Rad. Stay, 64½" Long, Wide, 114" 42" Wagon Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	34000	CAL GAUGE OF TRACK	METRES	1.435
~	DIA.		$64\frac{1}{8}''$	WORK	DRIVERS	120000	GRATE AREA	SQUARE FEET	32.4
CYLINDERS WHEELS BOILER	TYPE		stay, n Top	IT IN	ia	12	GRA	ðs	
			Rad. S Wago	WEIGI	TRAILING		FT.	TOTAL	2173
	LEADING	DIA.	33" F	ERAGE		0	E, SQ.	ARCH PIPES	24
			4	AV	TENDER	103000	EL HEATING SURFACE, SQ. FT.	ARCH	
	COUPLED DRIVERS	DIA.	29	WHEEL BASE	ENGINE AND TENDER	$3\frac{5}{16}$ " 15'-0" 15'-0" 25'-6" 52'-9\frac{1}{4}"		FIRE BOX	178
		NO.	9			. 52		FLUES	971
	TRAILING	DIA.	1		ENGINE	25′-6			1 19
		Š.			RIGID	15′-0″			Bituminous Coal 1971
	TENDER NO. DIA.		36″		DRIVING		FUEL	KIND	umino
	Z		30″ 8	FLUES		15	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	Bit
	DIA. STROKE								0
	TYPE		Simple $19\frac{1}{2}$ "			286 2" 13'			180
			Sim		NO.	286			
			133						



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A. 1898

FOR THE WISCONSIN CENTRAL LINES,

CODE WORD, QUINIC.

TYPE, 10-WHEELED PASSENGER.

WITH 8-WHEELED TENDER

TANK CAPACITY 4500 U. S. GALLONS AND 10 TONS FUEL.

SERIES, 637. CLASS, 19 D.

LENGTH, WIDTH Long, Wide, 113" 413" Sloping FEET INCHES GRATE AREA GAUGE OF TRACK 149000 ENGINE FOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FIRE BOX METRES LEADING WHEELS 34000 TYPE SQUARE FEET ,,99 DIA. 115000 DRIVERS BOILER Improved Belpaire TYPE TOTAL. FRAILING WHEELS HEATING SURFACE, SQ. FT. 33″ DIA. LEADING ARCH PIPES 94000 NO. TENDER COUPLED DRIVERS FIRE BOX DIA. ,69 ENGINE ENGINE AND 52'-1" TENDER WHEELS NO. 9 FLUES WHEEL BASE TRAILING DIA. 14'-6" NO. RIGID FUEL KIND TENDER NO. DIA. 13'-2\frac{1}{4}" 14'-6" DRIVING STROKE **2**6′ BOILER PRESSURE DIA, LENGTH POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS 19″ DIA. FLUES Simple Piston TYPE Valve 308

1.435

32.4

2300

24

165

2111

Bituminous Coal

200

135



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

FOR THE GREAT NORTHERN RAILWAY.

CODE WORD, QUININE.

TYPE, 10-WHEELED PASSENGER.

WITH 8-WHEELED TENDER

137

SERIES, 485. CLASS, 19 D.

TANK CAPACITY 4000 U. S. GALLONS AND 81/2 TONS FUEL.

BOX	LENGTH WIDTH		114" 32"	Pounds	TOTAL	138000	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE		Long, Sloping	IG ORDER,	LEADING	27000		METRES	1.435
WHEELS	DIA		ed 60"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	111000	GRATE AREA	SQUARE FEET	25.3
	TYPE		Improved Belpaire	E WEIGHT	TRAILING WHEELS			TOTAL	1798
	LEADING	NO. DIA.	4 33"	WHEEL BASE AVERAG	TENDER	00098	FUEL HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS	DIA.	72″		ENGINE AND TENDER	52'-4"		FIRE BOX	152
	TRAILING	DIA. NO.	9		ENGINE	202 2‡" 13'-10" 14'-6" 14'-6" 52'-4"		FLUES	Bituminous Coal 1646
	TENDER TRAI	DIA, NO.	33″ —		G RIGID	14'-6"		KIND	ninous Co
	Z		26" 8		FH DRIVING	.0″ 14′-6	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	Bitur
CYLINDERS	TYPE DIA. STROKE		Simple 19" 26" 8 33"	FLUES	DIA, LENGTH	2‡" 13'-1			180
			Simp		NO,	202	BOILE	POUNI	



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., USA.

FOR THE CHICAGO, ROCK ISLAND & PACIFIC RAILWAY.

SERIES, 439.

CODE WORD, QUINISM.

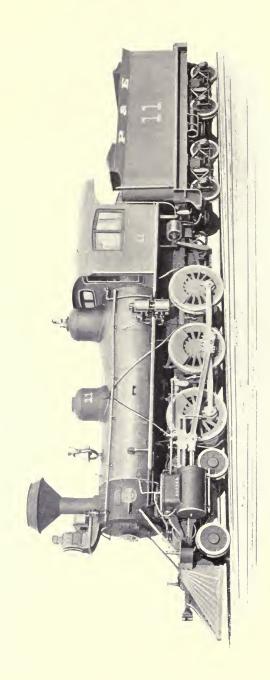
CLASS, 19 D.

WITH 8-WHEELED TENDER

TYPE, 10-WHEELED FREIGHT.

TANK CAPACITY 3600 U. S. GALLONS AND 7 TONS FUEL.

FIRE BOX E LENGTH WIDTH	103" 34½" Pounds	TOTAL. ENGINE	132000	GAUGE OF TRACK	FEET INCHES	4'-81"
FIRE	Long, Sloping	LEADING	25500		METRES	1.435
BOILER TYPE DIA.	4 30" Rad. Stay, 60" Long, 103". AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	106500	GRATE AREA	SQUARE FEET	24
Ţ	, Rad. S Wagoi	TRAILING		FT.	IOTAL.	1898
LEADING NO. DIA.	4 30" AVERAGE	TENDER	76000	RFACE, So.	ARCH PIPES	18
THEELS COUPLED DRIVERS NO. DIA.	63\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	ENGINE AND	16'-10"	HEATING SURFACE, SQ. FT.	FIRE BOX	140
>	- 6 BÀSE	ENGINE	3′-0″ 4	HE	FLUES	1740
TENDER TRAILING O. DIA. NO. DIA.	33" — — WHEEL BASE	RIGID	'-1" 12'-4" 12'-4" 23'-0" 46'-10"	FUEL	KIND	Bituminous Coal
STROKE NO.	24″ 8	I DRIVING	" 12′-4	(±1)		Bitur
LINDERS	Simple 19" 2 FLUES	DIA, LENGTH	254 2" 13'-1'	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	160
CY	Similar Similar	, ox	254	BOIL	POUS	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898 FOR THE PRESCOTT & EASTERN RAILROAD,

CODE WORD, QUINNAT.

TYPE, 10-WHEELED FREIGHT.

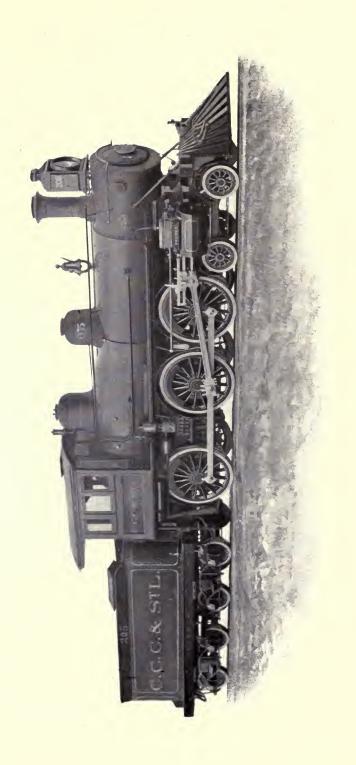
WITH 8-WHEELED TENDER

SERIES, 504 C.

CLASS, 19 D.

TANK CAPACITY 4500 U. S. GALLONS AND 8½ TONS FUEL.

	1	E	\$.				1,1	ES	
		LENGIH WIDIH	108" 33"	NDS	TOTAL	130000	FRACE	NCHES	4'-83"
BOX		LENC	108	Pour			0F	FEET	4
FIRE BOX	TVDE	1115	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	24000	GAUGE OF TRACK	METRES	1.435
~	PI	DIA.	28″	WORKIN	DRIVERS	106000	GRATE AREA	SQUARE FEET	24
BOILER	(i	4	Bar, Top	T IN	DR	10	GRA	ıòs	
B	TVDE	7 7 7	Crown Bar, Wagon Top	WEIGH	FRAILING		FT.	TOTAL	1606
	LEADING	DIA.	28′′	RAGE	H.		S ₀ .	IPES	
	LEA	NO.	4	AVEI	TENDER	00006	FACE,	ARCH PIPES	
	COUPLED DRIVERS	DIA.	26″				HEATING SURFACE, SQ. FT.	FIRE BOX	142
WHEELS	UPLED	NO.	9		ENGINE AND TENDER	48′-1	- IEATI		
WH				ASE	ENGINE	$^{-7\frac{1}{8}''}$ 12'-0" 12'-0" 21'-10" 48'-10 $^{\frac{3}{4}}$ "		FLUES	Bituminous Coal 1464
	TRAILING	DIA.		WHEEL BASE		21,			oal
	TR	NO.		WHE	RIGID	12′-0″	J.	Q	us C
	TENDER	DIA.	33″		D _Z	,`c	FUEL	KIND	mino
		NO.	∞		DRIVING	12′-(Bitu
S	STROKE		24″		LENGTH	-7 <u>1</u> ″	URE	CH	
CYLINDERS	DIA.		19″	FLUES		12,	RESS	R SQ. IN	0
CYLL	PE		Simple 19"	FLI	DIA.	224 2″	BOILER PRESSU	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
	TYPE		Sim		NO.	224	BOIL	POU	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

 ${}^{1\,8\,9\,3}_{\rm FOR\ THE\ CLEVELAND,\ CINCINNATI,\ CHICAGO\ \&\ ST.\ LOUIS\ Railway.}$

CODE WORD, QUINOGEN.

TYPE, 10-WHEELED PASSENGER.

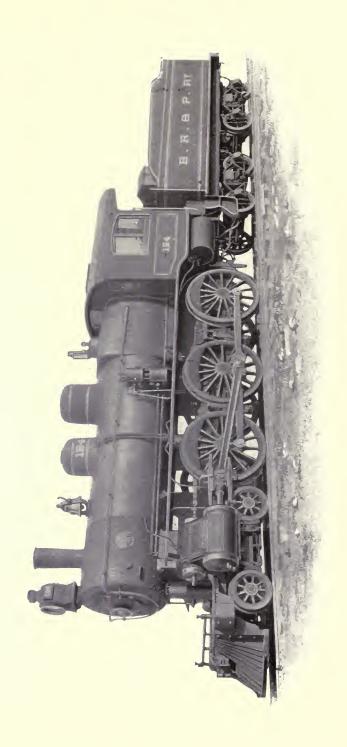
WITH 8-WHEELED TENDER

CLASS, 181 D. TANK CAPACITY 4000 U. S. GALLONS AND 8 TONS FUEL.

SERIES, 517.

BOX	LENGTH WIDTH	102" 42"	SOUNDS	TOTAL	135500	GAUGE OF TRACK	FEET INCHES	4'-81"
FIRE BOX	TYPE	Long, Wide, 102" 42" Sloping	NG ORDER, 1	LEADING WHEELS	26000		METRES	1.435
BOILER	E DIA.	Crown Bar, 58" Wagon Top	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	109500	GRATE AREA	SQUARE FEET	29.1
B	TYPE	-	E WEIGH	TRAHJING WHEELS		FT.	TOTAL.	1974
	LEADING NO. DIA.	4 30″	AVERAG	TENDER	00006	RFACE, SQ.	ARCH PIPES	
STE	COUPLED DRIVERS NO. DIA.			ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	155
WHEELS		9	WHEEL BASE	ENGINE	722,-8	H	FLUES	1819
	TENDER TRAILING NO. DIA. NO. DIA.	8 33″ –	WHEEI	DRIVING	2" 13'-10\frac{1}{8}" 15'-6" 9'-0" 25'-8" 49'-0"	FUEL	KIND	Bituminous Coal 1819
CYLINDERS	TYPE DIA. STROKE	Simple $18\frac{1}{2}$ " 24 " 8 33"	FLUES	DIA, LENGTH		BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180 E
	ΤV	Sim		°ON	252	BOII	POU	

143



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE BUFFALO, ROCHESTER & PITTSBURG RAILWAY.

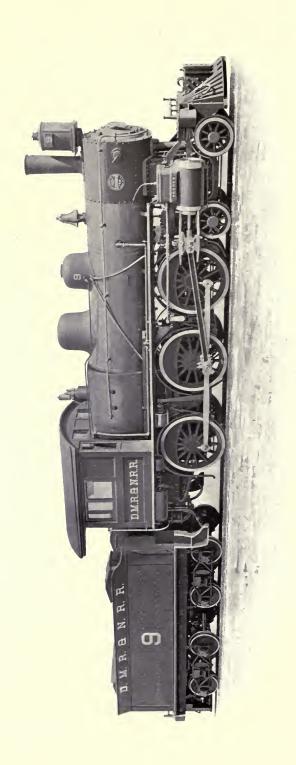
CLASS, 18 D.

SERIES, 681.

TYPE, 10-WHEELED PASSENGER. WITH 8-WHEELED TENDER CODE WORD, QUINOME.

TANK CAPACITY 4500 U. S. GALLONS AND 101 TONS FUEL.

	CYLINDERS	DERS					WH	WHEELS				BO	BOILER		FIRE BOX	BOX	
TVDE			g around	TENDER		TRAILING		UPLED	COUPLED DRIVERS	LEAI	LEADING	TVDE		610	TVDE	Habitan Habitan	A COLUMNIA DE LA COLUMNIA DEL COLUMNIA DE LA COLUMNIA DEL COLUMNIA DE LA COLUMNIA
-			MONE	NO. DIA.		NO. DIA.	,	NO.	DIA.	NO.	DIA.	1111		i i	7117	LENGIR	WIDIN
Simple Piston Valve	0) -	18″ 2	,,92	26" 8 33½"	31,		1	9	,,69	4	$30\frac{1}{2}$ "	30½" Improved Belpaire		62" 1	Long, Wide, 108" 42"	108″	42″
	FLUES	ES			WH	WHEEL BASE	BASE			AVE	SAGE	WEIGHT	IN W	ORKE	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pounds	
NO.	DIA.	LENGTH		DRIVING	RIGID		ENGINE	ENGINE AND TENDER		TENDER	TR	FRAILING	DRIVERS	oc.	LEADING	TOTAL	NE NE
272	272 2" 13'		\	14′-0″	14′-(0″ 2.	4'-3"	51′-1	$-2\frac{1}{4}$ " $14'-0$ " $14'-0$ " $24'-3$ " $51'-10\frac{9}{4}$ " 103000	03000			109000	0	33000	142000	000
BOII	BOILER PRESSURE	ESSUE	ZE.	<u>~</u>	FUEL			HEATI	HEATING SURFACE, SQ. FT.	RACE,	SQ. F7		GRATE AREA	ARE	A GAUGE OF TRACK	OF TRA	ACK
POT	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	SQ. ІМСН ЭЗРНЕКЕ			KIND		FLUES		FIRE BOX	ARCH PIPES	IPES	TOTAL	SQUARE FEET	FEET	METRES	FEET	INCHES
	200			Bituminous Coal 1862	snou	Coal	186	0	157	_		2019	30.8	∞	1.435	4'-81"	100



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE DULUTH, MISSISSIPPI RIVER & NORTHERN RAILROAD.

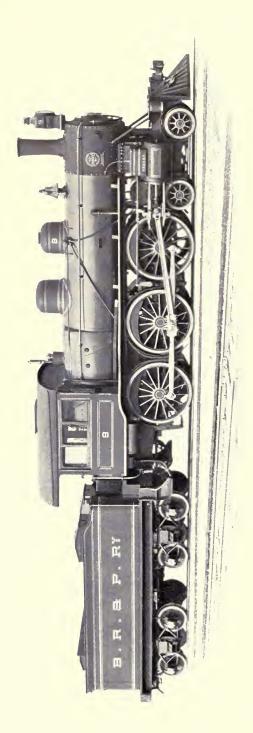
TYPE, 10-WHEELED PASSENGER. CODE WORD, QUINOVIC.

WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

SERIES, 658. CLASS, 18 D.

FIRE BOX	LENGTH WIDTH	97" 32"	, Pounds	TOTAL	127800	GAUGE OF TRACK	FEET INCHES	4'-83"
FIRE	TYPE	Long, Sloping	NG ORDER	LEADING	30000		METRES	1.435
BOILER	TYPE DIA.	Improved Belpaire 56"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	97800	GRATE AREA	SQUARE FEET	20.92
I		30" Impr Belp	AGE WEIGH	TRAILING WHEELS		50. FT.	ES TOTAL	1681
	RS LEADING NO. DIA	4	AVER.	TENDER	85000	SURFACE,	X ARCH PIPES	
WHEELS	COUPLED DRIVERS NO. DIA.	6 63"		ENGINE AND TENDER	$51'-1\frac{1}{8}''$	HEATING SURFACE, SQ. FT.	S FIRE BOX	2 119
- WH	JLING DIA.		WHEEL BASE	ENGINE	24'-4"		FLUES	oal 1562
	TENDER NO. DIA.	8 33" —	WHE	DRIVING	-4½" 14'-0" 14'-0" 24'-4" 51'-1¾"	FUEL	KIND	Bituminous Coal
CYLINDERS	TYPE DIA. STROKE	Simple 18" 24"	FLUES	NO, DIA, LENGTH	225 $2''$ $13'-4\frac{1}{8}''$	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
		147						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE BUFFALO, ROCHESTER & PITTSBURG RALLWAY.

CODE WORD, QUINOYL.

CLASS, 18 D.

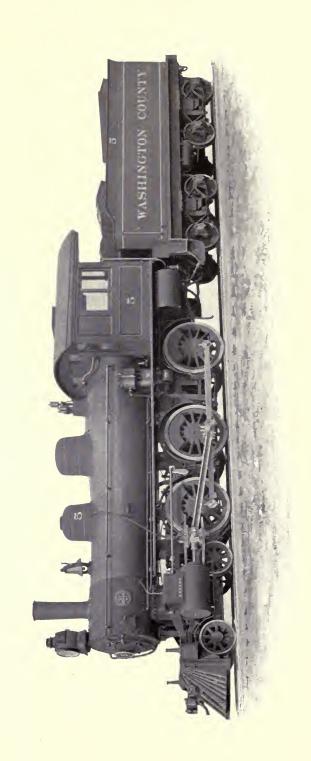
SERIES, 619.

WITH 8-WHEELED TENDER

TYPE, 10-WHEELED PASSENGER.

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

	WIDTH	32″		AL	000	ACK	INCHES	\$\frac{31}{2}''
BOX	LENGTH WIDTH		Pounds	TOTAL	125000	OF TR.	THH	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, Pounds	LEADING WHEELS	29000	A GAUGE OF TRACK	METRES	1.435
~	DIA.	22′′	WORKI	DRIVERS	00096	GRATE AREA	SQUARE FEET	21.2
BOILER	TYPE	Improved Belpaire	VEIGHT IN	TRAILING D			TOTAL S(1685
	LEADING NO. DIA.	4 30"	AVERAGE V	TENDER WH	- 00068	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS NO. DIA.	,,89		ENGINE AND TENDER		TING SURF	FIRE BOX	122
WHEELS		9	SASE	ENGINE ENGLY	3'-2" 50	HEAT	FLUES	1563
a management of the second	DER TRAILING DIA. NO. DIA.	33" — —	WHEEL BASE	RIGID	$'-4\frac{1}{8}''$ 13'-0" 23'-2" 50'-7"	FUEL	KIND	Bituminous Coal
	TEN NO.	× × × × × × × × × × × × × × × × × × ×		DRIVING	13′-0″	Ţ		Bitumi
ERS	га. stroke 8" 24"		Š	LENGTH	$13'-4\frac{1}{8}''$	BOILER PRESSURE	SQ. INCH SPHERE	
CYLINDER		TYPE DIA. Simple 18"	FLUES	DIA.	225 2" 13'	ER PR	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
	TYPE			NO.	225	BOIL	POU	
		149						



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., C.S.A.

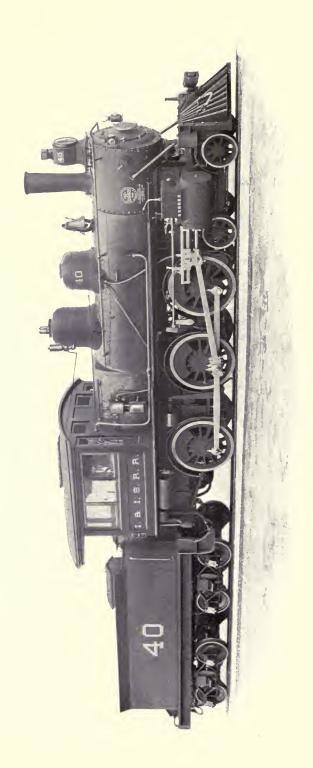
1898 FOR THE WASHINGTON COUNTY RAILROAD.

CODE WORD, QUINQUE.
TYPE, 10-WHEELED FREIGHT.

WITH 8-WHEELED TENDER

Series, 646. Class, 18 D. Tank Capacity 4000 U. S. Gallons and $8\frac{1}{2}$ tons fuel.

	_								
		LENGIH WIDIH	97" 33"	S	TOTAL	18800	ACK	INCHES	4'-81"
BOX		LENGIH	97″	Pound	TOT	118	OF TR	FEET	4
FIRE BOX	TVBE	7717	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	24400	A GAUGE OF TRACK	METRES	1.435
	D.T.A.	DIA.	26″	WORKI	DRIVERS	94400	GRATE AREA	SQUARE FEET	21.8
BOILER	Ti Ci	1	tay, Top	T IN	DRI	96	GRA	sor	
B	TVDE	111	Rad. Stay, Wagon Top	WEIGH	TRAILING		T.	TOTAL	1608
	LEADING	DIA.	30″	RAGE	Es		SQ. F	IPES	1
	LEAI	NO.	4	AVE	TENDER	84000	RACE,	ARCH PIPES	
	COUPLED DRIVERS	DIA.	26″		AND		HEATING SURFACE, SQ. FT.	FIRE BOX	134
ELS	PLED I	NO.	9		ENGINE AND TENDER	50′-	EATH		
WHEELS				SASE	ENGINE	'-7" 13'-6" 13'-6" 23'-4" 50'-1"	H	FLUES	Bituminous Coal 1474
	TRAILING	DIA.		WHEEL BASE		2			oal
		, NO.		WHE	RIGID	13′-6′	FUEL	KIND	ous C
	TENDER	DIA.	33″		ING	<u>_</u> 9_	FU	2	ımin
		NO.	00		DRIVING	13,			Bitt
SS	a.root.a	ONIC	24"		LENGTH	,,,;	SURE	RE	
CYLINDERS	1	DIA.	18″	FLUES		12,	BOILER PRESSU	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	180
CYLI	TVPE		Simple 18"	FL	DIA.	225 2"	LER 1	OVE AT	-
	TV				NO.	225	BOII	POU	
			151						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

CARL A AA O TARTECKINE

FOR THE INDIANA & ILLINOIS SOUTHERN RAILROAD.

FOR THE IN

Series, 649. Class, 18 D.

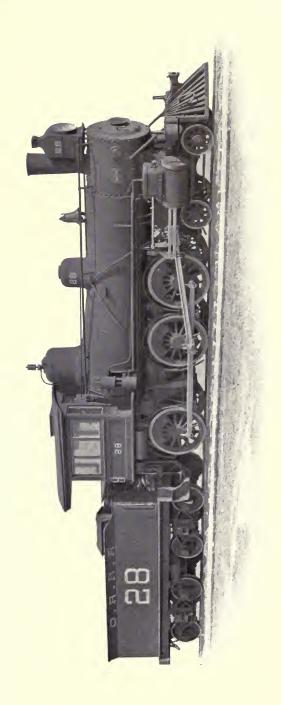
CODE WORD, QUINSY.

TYPE, 10-WHEELED FREIGHT.

WITH 8-WHEELED TENDER

TANK CAPACITY 3700 U. S. GALLONS AND 7 TONS FUEL.

CYLINDERS	ERS			gadhad	OWLITAGO	=	WHEELS	/HEELS	4	Civid	BO	BOILER		FIRE	FIRE BOX	T
TYPE DIA, STROKE NO, DIA.	STROKE NO.	NO.			NO.		NO.	DIA.	NO.	DIA.	TYPE		DIA.	TYPE	LENGTH	LENGTH WIDTH
Simple 18" 24" 8 33"	24" 8	∞					9	26′′	4	,×8′	Improved Belpaire		26″	Long, Sloping	,,96	34"
FLUES		WI	WI	W	EE	WHEEL BASE			AVE	RAGE	WEIGHT	NI	VORKIN	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pound,	
DIA, LENGTH DRIVING RIGID	DRIVING	DRIVING		RIGID		ENGINE	ENGIN	ENGINE AND TENDER	TENDER	TR	TRAILING	DRIVERS	ERS	LEADING	TOT	TOTAL
225 2" 12'-7\frac{1}{8}" 13'-6" 13'-6" 23'-4" 49'-10"	$12'-7\frac{1}{8}''$ $13'-6''$ $13'-6'$	" 13′-6″ 13′-6′	-6" 13'-6'	3′-6′	_	23′-4″	49′-		77000			95700	00	26550	122	22250
BOLLER PRESSURE FUEL			FUEL	- 1			HEAT	HEATING SURFACE, SQ. FT.	REACE,	SQ. F	ī.	GRAT	GRATE AREA	GAUGE OF TRACK	OF TR	ACK
POUNDS PER SQ, INCH ABOVE ATMOSPHERE		KIND	KINB			FLUES	TES	FIRE BOX	ARCH PIPES	IPES	TOTAL	SQUAI	SQUARE FEET	METRES	FEET	INCHES
180 Biruminous Coal		Bituminous C	minous C	us C	ő		1472	130	16.5		1618.5		21	1.435		4'-8½"



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1896

FOR THE OHIO RIVER RAILROAD.

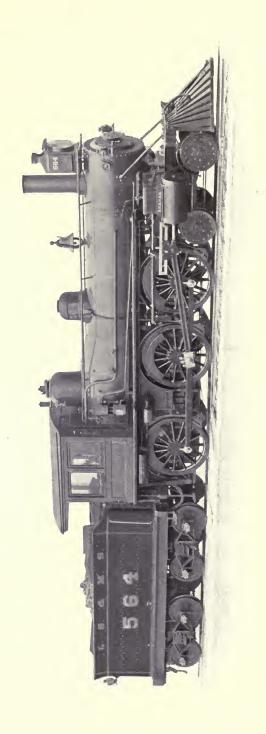
TYPE, 10-WHEELED FREIGHT. CODE WORD, QUINTAL.

WITH 8-WHEELED TENDER

TANK CAPACITY 3000 U. S. GALLONS AND 6 TONS FUEL.

CLASS, 18 D. SERIES, 577.

Distriction in	11 (11 th	34½"	DS	OTAL	0009	RACK	INCHES	$4'-8\frac{1}{2}''$							
F-2.VG 1	The same	72″	t, Poun	T.	10	OF T	FEET								
TVPF		Deep	G ORDER	LEADING	28000		METRES	1.435							
DIA		. 54″	WORKIN	UVERS	8000	TE AREA	TARE FEET	16.7							
TVPF		own Bar, agon Top	SIGHT IN		22	GRA		1497							
NG	DIA.	28″ Cı	AGE WE	TRAILE		SQ. FT.		14							
	NO.	4	AVER	TENDER	64000	RFACE,	ARCH PII								
DRIVERS	DIA.	26″		KE AND NDER	-11″	ring su	FIRE BOX	114							
COUPLE	NO.	9	L BASE	L BASE	L BASE	EL BASE	EL BASE	SEL BASE	EEL BASE	EEL BASE		,, 46	HEA	LUES	1383
LING	DIA.										EEL BASE	EEL BASE	EL BASI	EL BASI	ENGIN
	. NO.		WHEE	RIGID	%-6″	EL	ÛN	ons Co							
TENDER	NO. DIA	8 33		ORIVING	3'-9"	FU	K	Bituminous Coal							
anogas	SINONE	24″	-			URE	KCH KE	М							
	DIA.	18′′	UES		" 13	PRESS	TMOSPHER	140							
TVDE	7111	Simple	FL	NO. DIA	206 2′	BOILER	POUNDS P ABOVE A								
	TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA TYPE	NDER TRAILING COUPLED DRIVERS LEADING DIA. NO. DIA. NO.	e 18" 24" 8 33" — 6 56" 4 28" Wagon Top	TENDER TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. TYPE DIA. TYPE TYPE DIA. TYPE	TENDER TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. TYPE 1 24" 8 33" — 6 56" 4 28" Wagon Top WHEEL BASE AVERAGE WEIGHT IN WORKING ORDER, P TENDER TENDER TENDER WHEELS BRIVERS WHEELS DRIVERS WHEELS	TENDER TENDER TENDER TENDER TENDER TYPE DIA. TYPE TYPE	TENDER TENDER TENDER TENDER TENDER TENDER TYPE DIA. TYPE TY	TENDER TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. TYPE TYPE							



"THE RECORD BREAKER."

The above locomotive was one of five of our build which made "The Fastest of Fast Runs" from south Chicago to Buffalo on the 24th of 21, 1895, over the Lake Shore & Michigan Southern Railway, a distance of 510.1 miles. This locomotive, No. 564, pulled the train from Erie, 878 484 250 lbs. 700 gals. 500 lbs. October, 1895, over the Lake Shore & Michigan Southern Railway, a distance of 510.1 miles. Pa., to Buffalo, N. V., a distance of 86 miles, in 70 minutes and 46 seconds.

20	148	325	370	9.4	Total weight of train including engine, 50650	-
		Total amount of coal used,	Amount of water evaporated,			
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er ho	8 consecutive miles at the rate of	9, 1, 1, 9.08			* Average " " " " 371	*The diameter of drivers at time of run was 66 inches.
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Jax	8	22	9	Max	Ive	
		33	., ., ., ., ., ., ., ., ., ., ., ., ., .	*	*	

The engine made this remarkable performance without previous preparation, being taken off its regular run for the purpose, after having been in continuous service for over four years, and was in the exact condition shown in the photograph, which was taken in front of our works the day after the run.

BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

1891

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

FOR THE LAND

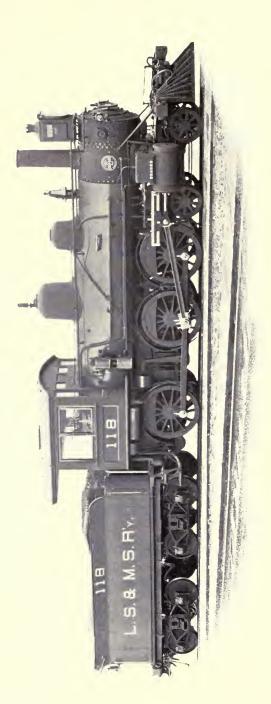
CODE WORD, QUINTETTE. TYPE, 10-WHEELED PASSENGER.

WITH 8-WHEELED TENDER

TANK CAPACITY 3700 U. S. GALLONS AND 7 TONS FUEL.

Series, 434. Class, 17 D.

	THE CHAIN		42″	S	TOTAL	118000	ACK	INCHES	$4'-8\frac{1}{2}''$									
BOX	TENCHI		96″ 42″	Pound	TOT	118	OF TR	FEET	4									
FIRE BOX	TVDF		33" Crown Bar, 52" Long, Wide, Saloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	22000	GRATE AREA GAUGE OF TRACK	METRES	1.435									
	DIA		52″	WORK	DRIVERS	00096	E ARI	SQUARE FEET	82									
BOILER	Į,	1	Bar, Top	T IN	DRI	96	GRAT	són										
ğ	TVDE	7 7	Crown	WEIGH	TRAILING		FT.	TOTAL	1603									
	LEADING	DIA.	33″	RAGE	E		, SQ. 1	PIPES										
	LEA	NO.	4	AVE	TENDER	78000	RACE	ARCH PIPES	18									
	DRIVERS	DIA.	,,89				HEATING SURFACE, SQ. FT.	FIRE BOX	123									
WHEELS	COUPLED DRIVERS	NO.	9		ENGINE AND TENDER	-10 ¹ / ₁₆ " 15′-0" 8′-6" 25′-3" 47′-8"	HEATI	FLUES	29									
W		DIA.	1.	WHEEL BASE	VHEEL BASE	VHEEL BASE	VHEEL BASE	VHEEL BASE	VHEEL BASE	WHEEL BASE	WHEEL BASE	WHEEL BASE	WHEEL BASE	ENGINE	25′-3″		FE	1 14
	TRAILING	NO.												WHEEL B.	VHEEL B	VHEEL B	VHEEL I	RIGID
	TENDER	DIA.	8 36″			8	FUEL	KIND	ninou									
		NO.			DRIVING	15′-0			Bitur									
SS		SIKONE	24"		LENGTH	$-10\frac{1}{16}$ "	SURE	NCH										
CYLINDERS	-	DIA.	17″	FLUES		, 13	PRESS	OUNDS PER SQ, INCH ABOVE ATMOSPHERE	180									
CYL	TUNE	TALE	Simple	FI	NO, DIA,	202 2" 13'-	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE										
L			157															



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

SERIES, 627. CLASS, 17 D. TANK CAPACITY 3100 U. S. GALLONS AND 7 TONS FUEL.

	FIRE BO
ł	FIR
ļ	BOILER
	BO
	S.
	WHEELS
	ERS
	CYLINDERS

WITH 8-WHEELED TENDER

TYPE, 10-WHEELED FREIGHT.

CODE WORD, QUINTIC.

BOX	LENGTH WIDTH	96" 34½"	Pounds	TOTAL	108000	GAUGE OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	TYPE	Long, Sloping	KG ORDER,	LEADING WHEELS	28500		METRES	1.435
BOILER	DIA.	Rad. Stay, Wagon Top 54"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	79500	GRATE AREA	SQUARE FEET	22.6
BO]	TYPE)" Rad. Sta Wagon	SE WEIGHT	TRAILING	Para de la companya d		TOTAL	18.6 1433.9
	S LEADING NO. DIA.	4 30"	AVERAC	TENDER	73000	JRFACE, SQ	ARCH PIPES	
WHEELS	COUPLED DRIVERS NO. DIA.	. 26″		ENGINE AND TENDER	45'-10"	HEATING SURFACE, SQ. FT.	FIRE BOX	123.3
WHI	AILING DIA.		WHEEL BASE	ENGINE	23'-7½"	I	RLUES	Coal 1292
	TENDER TRANO. DIA. NO.	TENDER NO. DIA. 8 33"	WIHI	DRIVING	'-0 _{1.6} " 13'-3" 13'-3" 23'-7 <u>1</u> " 45'-10"	FUEL	KIND	Bituminous Coal 1292
CYLINDERS	TYPE DIA. STROKE	Simple 17" 24"	FLUES	DIA, LENGTH	2″ 12	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	160
	TV	Sim		NO.	207	BOL	PO	

OF THE UNIVERSIT



HEAVIEST FREIGHT LOCOMOTIVE IN THE WORLD.

This locomotive is the heaviest ever built, and is designed to haul a train weighing 2,045 tons, exclusive of engine, tender and caboose, up a grade of 38 feet per mile, combined with 3 degree curves, at a speed of 15 miles per hour.

The boiler is of the Player-Belpaire type, and the thickness of the plates, 16" and 1", is, we believe, the greatest ever used upon locomotive boilers. The diameter at front end is 82", connection 88", and throat 914".

Nearly all parts of this locomotive usually made of cast iron are, with the exception of the cylinders, made of cast or pressed steel or

malleable iron.

BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

September, 1899,

FOR THE ILLINOIS CENTRAL RAILROAD,

WITH 8-WHEELED TENDER TYPE, 12-WHEELED FREIGHT. CODE WORD, QUIRANT.

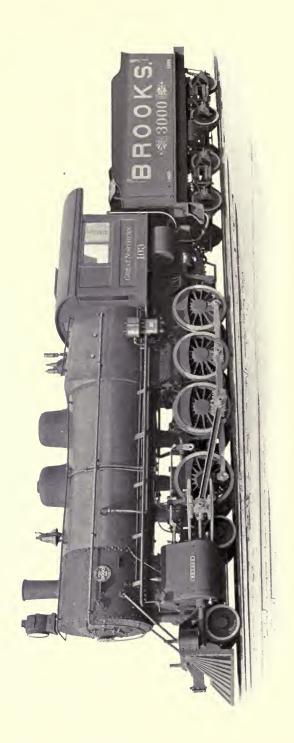
SERIES, 707. CLASS, 23 F.

TANK CAPACITY 7000 U. S. GALLONS AND 12 TONS FUEL.

_							_			
		LENGIH WIDTH	42″	DS	TOTAL	232200	RACK	INCHES	4'-83"	
BOX		LENGI	132′	Poun	□ □	23	OF T	FEET	4	
FIRE BOX	TVDE	LILE	82" Long, Wide 132" 42"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	39000	A GAUGE OF TRACK	METRES	1.435	
ER	DIA.			IN WORKI	DRIVERS	193200	GRATE AREA	SQUARE FEET	37.5	
BOILER	TYPE		Improved Belpaire	WEIGHT	TRAILING			TOTAL	3500	
	ING	DIA.	30″	AGE	E >		SQ. F	PES		
	LEADING	NO.	4	AVEF	TENDER	132700	RFACE,	ARCH PIPES		
	ING COUPLED DRIVERS	DIA.	57"	WHEEL BASE	GINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	263	
WHEELS		NO.	∞		EN	$-8\frac{3}{8}$ " 15'-9" 15'-9" 26'-6" 55'-2 $\frac{3}{4}$ "	HEAT	FLUES	3237	
W		DIA.			ENGINE	26′-6′		FL		
	TRAILING	NO.			WHEE	WHEE	RIGID	5′-9″	II.	Q
	TENDER	DIA.	33″		9		FUEL	KIND	ninoı	
		NO.	∞		DRIVING	15′-5			Bitur	
S	4.7004.5	NOW IS	30″		LENGTH	% 88 88 88	URE	CH		
CYLINDERS	1	DEA.	23″	ES	LEN		RESS	R SQ, IN	0	
CYLIN	TVPF		Simple Piston Valve	FLUES). DIA.	424 2" 14'	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	210	
			161		o N	42	BC			

FOR HAULING CAPACITY SEE PAGE 290.

161



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., USA.

 $1\,8\,9\,7$ For the GREAT NORTHERN RAILWAY.

CODE WORD, QUIRITE.

TYPE, 12-WHEELED FREIGHT.

WITH 8-WHEELED TENDER

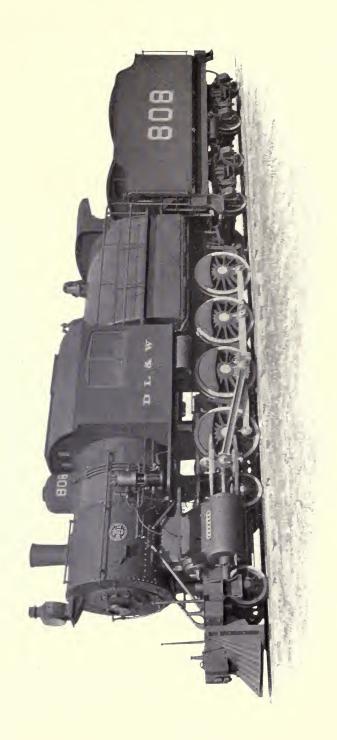
163

Series, **621**.
CLASS, 21 F.

CLAS TANK CAPACITY 4500 U. S. GALLONS AND 10 TONS FUEL.

	DTH	- 1	% 4			0	¥	INCHES			
	LENGTH WIDTH		3′′ 39	NDS	TOTAL	212750	TRAC		4'-8½"		
FIRE BOX	N.S.		12,	, Pou		(4	OF	FRET			
FIRE	TVPE		78" Long, Wide 123" 393"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	40750	A GAUGE OF TRACK	METRES	1.435		
~	DIA			WORKI	DRIVERS	172000	GRATE AREA	SQUARE FEET	34		
BOILER	TVPE		Improved Belpaire	IGHT IN		17	GRA		0		
				E WE	TRAILING		FT.	TOTAL	3280		
	LEADING	NO DIA.	4 33"	VERAG	S.R.	0	CE, Se	ARCH PIPES			
		ž	4	WHEEL BASE	TENDER	00096	JRFA	ARG			
	COUPLED DRIVERS	DIA.	55″		ENGINE AND TENDER	·3½″	HEATING SURFACE, SQ. FT.	FIRE BOX	235		
WHEELS	-	NO.	œ		WHEEL BASE		54′.	HEAT	FLUES	3045	
M		DIA.				ENGINE	26′-8′		FL		
	TRAILING	NO.				RIGID	08" 15'-10" 9'-8" 26'-8" 54'-31"	T		Bituminous Coal	
	TENDER	DIA.	33″), 6	
		NO.	∞		DRIVING	15′-10			Bitun		
S	STROKE		34"		LENGTH	103"	URE	CH E			
VDER	DIA.		21″	ES	LEN	13′-	RESS	SQ. IN	0		
CYLINDERS	TYPE		Simple Piston Valve	FLUES	NO. DIA.	376 2‡" 13'-10	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	210		

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE DELAWARE, LACKAWANNA & WESTERN RAILROAD.

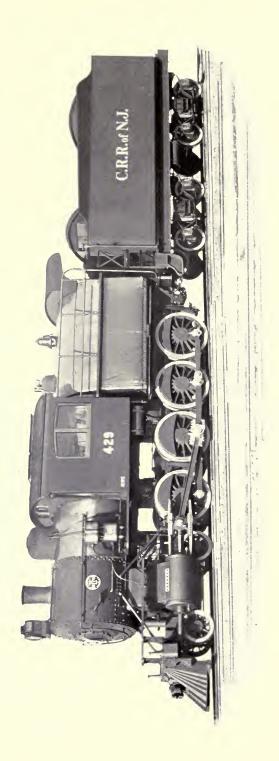
TYPE, 12-WHEELED FREIGHT. CODE WORD, QUIRLANE.

WITH 8-WHEELED TENDER

TANK CAPACITY 5000 U. S. GALLONS AND 10 TONS FUEL.

CLASS, 21 F. SERIES, 715.

ਤ ਦੇ ਲ	
FIRE BOX TYPE LENGTH WIDT LONG, Wide 123" 97" ING ORDER, POUNDS TOTAL WHEELS ENGINE 39000 205000 A GAUGE OF TRACK METRES FEET INCHE	1.435
BOHLER FIRE BOX	82.4
BOH TYPE TYPE Wagon 7 E WEIGHT WHEELS WHEELS FT. C	3168
THEELS COUPLED DRIVERS NO. DIA. 8 54" E TENDER " 50'-44" HEATING SU	218
TRAILING COUPLED NO. DIA. NO. NO. DIA. NO. WHEEL BASE WHEEL BASE 75'-0" 25'-9" 50'- I. HEAT	2950
	Fine Anthracite Coal
32" 8 33" 10 DRIVING 11 DRIVING RE FUF	Fine
CYLINDERS TYPE DIA. STROKE Simple Piston Valve FLUES NO. DIA. LENGTII A10 2" 13'-10\frac{3}{8}" BOILLER PRESSURE FOUNDS PER 80, INCH AROYE ATMOSPHERE	200
CVLJ TYPE Simple Piston Valve FLJ A10 2" BOILER J BOILER J AROYE ATH AROYE AT	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

8 9 9

FOR THE CENTRAL RAILROAD OF NEW JERSEY.

CODE WORD, QUIRLER.

TYPE, 12-WHEELED FREIGHT.

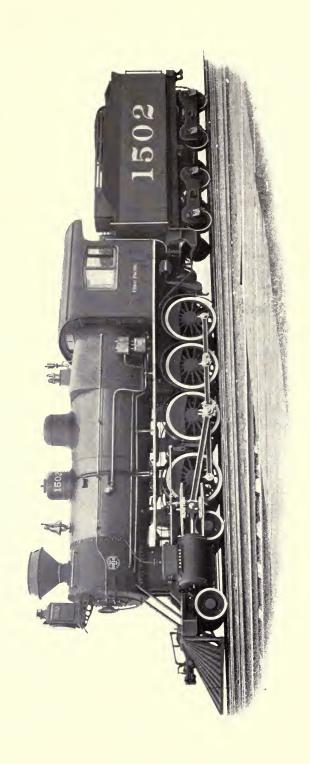
WITH 8-WHEELED TENDER

SERIES, 688.

CLASS, 21 F.

TANK CAPACITY 7000 U. S. GALLONS AND 12½ TONS FUEL.

	1		1				×	HES			
		HIGHW MIDIN	9	DS	TOTAL	201000	RAC	INCHES	$4'-8\frac{1}{2}''$		
BOX		15.00	123	Poun	E 3	77	OF T	FEET	4		
FIRE BOX	ET)		Rad. Stay, 78" Long, Wide 123" 97"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	ING	00	GAUGE OF TRACK	METRES	1.435		
	TVDF	1	ong,	G OR	LEADING	42000		ME			
			ĭ	KIN			REA	SET			
~	Tota	Tion of the second	78′	WOI	DRIVERS	159000	GRATE AREA	SQUARE FEET	82.4		
BOILER	Ti.	1	tay, Top	T IN	DR	15	GRA	ıòs			
Ř	TYPE		TYPI		ad. S	EIGH	ING			TOTAL	3168
			30″ F	E W	TRAILING		FT.		33		
	LEADING	DIA.	30	ERAC		0	3, SQ.	ARCH PIPES			
	LE	NO.	4	AV	FENDER	138600	FACI	ARCH			
	G COUPLED DRIVERS	DIA.	55″	WHEEL BASE			HEATING SURFACE, SQ. FT.	FIRE BOX	218		
Ñ		_	4,		ENGINE AND TENDER	3′-0″	TING	FIRE	2		
WHEELS		NO.	∞		ENG	Ω.	HEA	FLUES	2950		
[]		DIA.			ENGINE	5′-9″		FLL	29		
	TRAILING			EL		5	-		ite		
		NO.		WHE	RIGID	15′-0′	J.	Q	Fine Anthracite Coal		
	TENDER	DIA.	8 33″				FUEL	KIND			
		NO.			DRIVING	15′-(Fine		
	amogra	TWO WIS	32″		H	101 %	TRE	Ξ.,			
DERS			21″	S	LENGTH	13′-1	KESSL	SQ, INC			
CYLINDERS	(T	1		FLUES	DIA.	5,	SR PF	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	200		
	TVDF		Simple Piston Valve		ON	410 2" 13'-10 " 15'-0" 15'-0" 25'-9" 53'-0"	BOILER PRESSURE	POUN			



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A. 1899

FOR THE UNION PACIFIC RAILROAD,

CODE WORD, QUITTAL.

TYPE, 12-WHEELED FREIGHT.

WITH 8-WHEELED TENDER

SERIES, 699.

CLASS, 21 F.

TANK CAPACITY 5000 U. S. GALLONS AND 101 TONS FUEL.

-									
BOX	LENGTH WIDTH	124" 41"	Pounds	TOTAL	197000	GAUGE OF TRACK	FEET INCHES	4'-81"	
FIRE BOX	TYPE	Long, Wide 124" 41"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	34000		METRES	1.435	
ER	DIA.	92	N WORKI	DRIVERS	163000	GRATE AREA	SQUARE FEET	34	
BOILER	TYPE	Improved Belpaire	WEIGHT	TRAILING			TOTAL	2980	
	LEADING NO. DIA.	4 30″	AVERAGE	TENDER W	0000	HEATING SURFACE, SQ. FT.	ARCH PIPES	23	
	COUPLED DRIVERS NO. DIA.	27"		ENGINE AND TENTER TENDER	$10\frac{1}{2}$ 106000	ING SURF	FIRE BOX	208	
WHEELS		∞	WHEEL BASE	WHEEL BASE RIGID EXGINE 5'-11" 26'-7"		'-7" 53'-	HEAT	FLUES	2749
	TRAILING NO. DIA.				EL	D	Bituminous Coal		
	TENDER NO. DIA.	8 33″		DRIVING	15'-11" 1	FUEL	KIND	Bitumino	
CYLINDERS	DIA, STROKE	21" 30"	ES.	LENGTH		RESSURE	SQ. INCH OSPHERE	0	
CYLIN	TYPE	Simple 21"	FLUES	NO. DIA.	382 2" 13'-	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	200	
1		169							



The Administration of the Control of

BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1898

FOR THE CHICAGO, INDIANAPOLIS & LOUISVILLE RAILROAD.

CODE WORD, QUITTOR.

TYPE, 12-WHEELED FREIGHT.

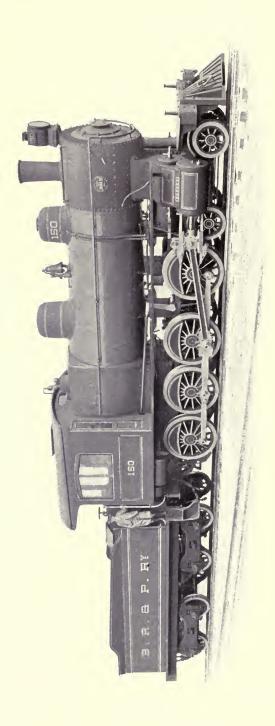
WITH 8-WHEELED TENDER

CLASS, 21 F.

SERIES, 650.

TANK CAPACITY 4500 U. S. GALLONS AND 10 TONS FUEL.

	100000	HIDIM	42″		NE NE	000	ACK	INCHES	101	
BOX	THE PERSON AND PARTY.	LENGIN	121″	Pounds	TOTAL	172000	OF TRA	FEET	4′-8½″	
FIRE BOX	ТУРЕ	7 11 1	70" Long, Wide 121" 42"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	32000	GAUGE OF TRACK	METRES	1.435	
ER	DIA	Diff.		N WORKIN	DRIVERS	140000	GRATE AREA	SQUARE FEET	34.4	
BOILER	TVDF		Improved Belpaire	WEIGHT I	TRAILING			TOTAL	2674	
	LEADING	DIA.	4 30″	RAGE	TR.		, SQ. F	PIPES	24	
		NO.	4	AVE	TENDER	90000	RFACE	ARCH PIPES	(2)	
	ING COUPLED DRIVERS	DIA.	54″	WHEEL BASE	ENGINE AND TENDER	-6 <u>1</u> ″	HEATING SURFACE, SQ. FT.	FIRE BOX	214	
WHEELS		NO.	∞		国		300 $2\frac{1}{4}$ $13'-10\frac{1}{4}$ $15'-4$ $15'-4$ $25'-11$ $54'-6\frac{1}{2}$	HEAT	FLUES	2436
=		DIA.			WHEEL BASI	ENGINE	25′-11		FI	
	TRAILING	NO.				RIGID	5′-4″	T	0	Bituminous Coal
	TENDER	DIA.	.8 33″			ING	-4″ 1	FUEL	KIND	ımino
		NO.	.8		DRIVING	15′			Bitt	
ERS	anogus		21″ 26		LENGTH	$3'-10\frac{1}{4}$	SSURE	, INCH HERE		
CYLINDERS	VIG.		1	FLUES	DIA.	2‡″ 1	R PRE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	200	
CY	TVPF		Simple Piston Valve		, ON	300	BOILER PRESSURE	POUNDS		



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE BUFFALO, ROCHESTER & PITTSBURGH RAILROAD.

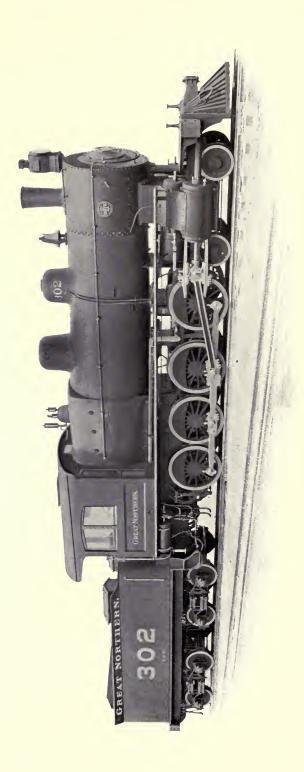
TYPE, 12-WHEELED FREIGHT. CODE WORD, QUIVER.

CLASS, 20 F. SERIES, 663.

WITH 8-WHEELED TENDER

TANK CAPACITY 4500 U. S. GALLONS AND 10 TONS FUEL.

BOX	LENGTH WIDTH	114" 42"	Pounds	TOTAL	156000	GAUGE OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	TYPE	66" Long, Wide 114" 42"	NG ORDER,	LEADING WHEELS	30000	A GAUGE	METRES	1.435
BOILER	E DIA.		AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	126000	GRATE AREA	SQUARE FEET	32.4
BO	ING TYPE	0½" Improved Belpaire	GE WEIGHT	TRAILING		2. FT.	TOTAL	2298
	LEAD NO.	$4 30\frac{1}{2}$ "	AVERA	TENDER	00096	RFACE, S	ARCH PIPES	
ST	COUPLED DRIVERS NO. DIA.	55″		ENGINE AND TENDER	51'-5 ³ "	HEATING SURFACE, SQ. FT.	FIRE BOX	190
WHEELS			BASE	ENGINE	2" 13'-24" 15'-6" 15'-6" 25'-8" 51'-54"	H	FLUES	1 2108
	TRAIL NO.		WHEEL BASE	RIGID	15'-6"	FUEL	KIND	Bituminous Coal
	TENI NO.	26" 8 33½" —		DRIVING	15′-6″	Y.		Bitumir
CYLINDERS	DIA. STROKE	20″ 26′	FLUES	LENGTH	13'-2\frac{1}{4}"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	200
CYLIN	TYPE	Simple Piston Valve	FLU	NO. DIA.	308 2″	BOILER P	POUNDS PER SQ. INCHABOLE ATMOSPHERE	20



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

FOR THE GREAT NORTHERN RAILWAY.

CODE WORD, QUIVOX.

TYPE, 12-WHEELED FREIGHT.

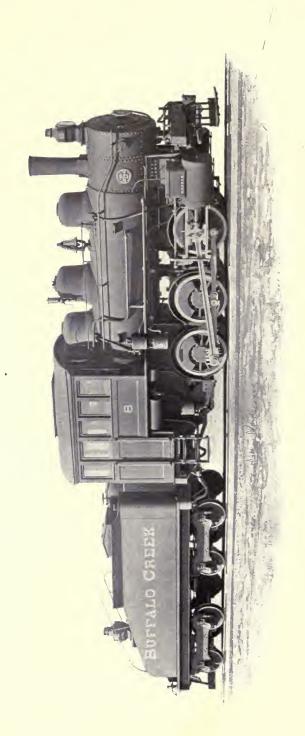
WITH 8-WHEELED TENDER

SERIES, 655.

CLASS, 19 F.

TANK CAPACITY 4500 U. S. GALLONS AND 81/2 TONS FUEL.

LENGTH WIDTH FEET INCHES 45″ GAUGE OF TRACK 176000 $4'-8\frac{1}{2}''$ TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS 124″ FIRE BOX Long, Wide 1.435 METRES LEADING WHEELS 34000 TYPE GRATE AREA SQUARE FEET 72″ DIA. 142000 35.2 DRIVERS BOILER Improved Belpaire TYPE 2872 TRAILING WHEELS TOTAL HEATING SURFACE, SQ. FT. 30″ NO. DIA. LEADING ARCH PIPES 26 92000 TENDER TRAILING | COUPLED DRIVERS FIRE BOX DIA. 55" 224 ENGINE AND TENDER $53'-9\frac{1}{4}''$ WHEELS NO. ∞ 2622 FLUES 26'-1" WHEEL BASE ENGINE DIA. Bituminous Coal NO. 2‡" | 13'-10\]" | 15'-4" | 9'-8" RIGID FUEL KIND 33″ TENDER DIA. DRIVING NO. ∞ STROKE 32″ BOILER PRESSURE LENGTH POUNDS PER SQ, INCH ABOVE ATMOSPHERE CYLINDERS DIA. 19″ FLUES 200 DIA. Simple Piston Valve TYPE 324 ÖN.



BROOKS LOCOMOTIVE WORKS BUILT BY

DUNKIRK, N. Y., U.S.A. 1897

FOR THE BUFFALO CREEK RAILROAD.

TYPE, 6-WHEELED SWITCHER. CODE WORD, QUODDA.

WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 5 TONS FUEL.

SERIES, 599. CLASS, 20 H.

_								
X	LENGTH WIDTH	96" 42"	UNDS	TOTAL	124800	TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	TYPE	ng, Wide	ORDER, Po	LEADING		GAUGE OF TRACK	METRES	1.435
BOILER	DIA.	Rad. Stay, Straight Top 60" Long, Wide 96" 42"	AVERAGE WEIGHT IN WORKING ORDER, Pounds	DRIVERS	124800	GRATE AREA	SQUARE FEET	27.9
BOI	TYPE		SE WEIGHT	TRAILING			TOTAL	1426
	S LEADING NO. DIA.		AVERAG	TENDER	75000	HEATING SURFACE, Sq. FT.	ARCH PIPES	
TS	COUPLED DRIVERS NO. DIA.	50″		ENGINE AND TENDER	2'-6\frac{3}{4}''	ATING SU	FIRE BOX	133
WHEELS		9	BASE	ENGINE	10′-8″ 4	HE	FLUES	1 1293
	TRAII	33″ —	WHEEL BASE	RIGID	$1\frac{1}{4}$ " $10'-8$ " $10'-8$ " $42'-6\frac{3}{4}$ "	FUEL	KIND	Biruminous Coal 1293
	TENDER NO. DIA.	24" 8 3		DRIVING	, 10′-8″			Bitumi
CYLINDERS	DIA. STROKE		FLUES	LENGTH	11′-	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	160
CYLI	TYPE	Simple 20"	FL	NO, DIA,	224 2"	BOILER	POUNDS PI ABOVE AT	
		177						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898

TYPE, 6-WHEELED SWITCHER.

CODE WORD, QUODIG.

FOR THE GREAT NORTHERN RAILWAY.

CLASS, 19 H. SERIES, 671.

LENGTH WIDTH 42″ 137000 TOTAL AVERAGE WEIGHT IN WORKING ORDER, Pounds FIRE BOX Long, Wide TANK CAPACITY 4000 U. S. GALLONS AND 6 TONS FUEL. LEADING WHEELS TYPE ,,99 DIA. 137000 DRIVERS BOILER Improved Belpaire TYPE TRAILING NO. DIA. LEADING 80000 TENDER TRAILING COUPLED DRIVERS 49″ DIA. ENGINE AND TENDER 42'-2\frac{1}{2}'' WHEELS S.O. 0 2" | 11'-1‡" | 11'-0" | 11'-0" | 11'-0" WHEEL BASE ENGINE DIA. WITH 8-WHEELED TENDER NO. RIGID TENDER 33″ DIA. DRIVING NO. ∞

FOR HAULING CAPACITY SEE PAGE 290.

FEET INCHES

METRES

SQUARE FEET

TOTAL

ARCH PIPES

FIRE BOX

FLUES

KIND

POUNDS PER SQ, INCH ABOVE ATMOSPHERE

 $4'-8\frac{1}{2}''$

1.435

32.4

1842

20

188

1634

Bituminous Coal

200

GAUGE OF TRACK

GRATE AREA

HEATING SURFACE, SQ. FT.

FUEL

BOILER PRESSURE

284

Valve

, 8 28,

19″

Simple Piston

FLUES

LENGTH

DIA.

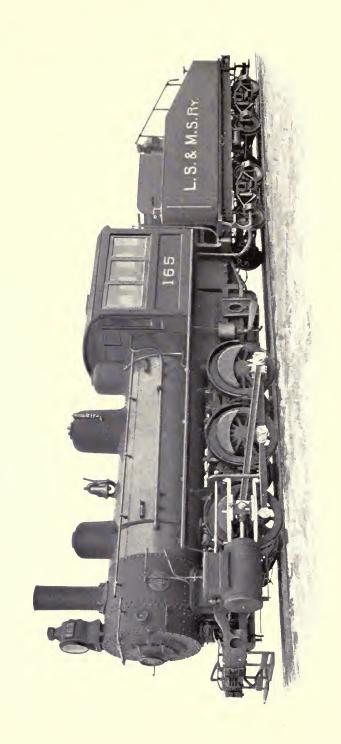
ON

STROKE

DIA.

TYPE

CYLINDERS



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1899

FOR THE LAKE SHORE & MICHIGAN SOUTHERN RAILWAY.

TYPE, 6-WHEELED SWITCHER. CODE WORD, QUOIF.

SERIES, 682.

CLASS, 19 H.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 3500 U. S. GALLONS AND 5 TONS FUEL.

-	-		1				1	ES	
X	THE PARTY AND ADDRESS OF THE PARTY AND ADDRESS	MID!	80" 34½"	UNDS	TOTAL	122700	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX		T	_ &	R, Po			E OF	-	10
FIR	TVDE	7117	Long	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING			METRES	1.435
		i		RKIN			GRATE AREA	FEET	
3R	- DIA		Rad. Stay, Straight Top 64"	OW N	DRIVERS	122700	ATE.	SQUARE FEET	18.6
BOILER	TVDE	7	Stay, ght To	HT		-	GR	u .	-
		_	Rad. Strai	: WEIG	TRAILING		FT.	TOTAL	2019
	LEADING	DIA.	-	RAGE	L.		, So.	PIPES	18
	LEA	NO.		AVE	TENDER	79000	REACE	ARCH PIPES	==
	IVERS	DIA.	52"		·		HEATING SURFACE, SQ. FT.	FIRE BOX	145
ST	COUPLED DRIVERS				ENGINE AND TENDER	$3'$ - $8\frac{3}{4}$	ATIN	FIR	
WHEELS	COUP	NO.	9	SE		$-6\frac{1}{4}$ " 11'-3" 11'-3" 43'-8 $\frac{3}{4}$ "	HE	FLUES	1856
	TRAILING	DIA.		L BA	ENGINE	11′-			al
	TRAI	NO.		WHEEL BASE	RIGID	1′-3″	ر		Bituminous Coal
	TENDER	DIA.	30″			2, 1	FUEL	KIND	ninot
		NO.	∞		DRIVING	11/-3			Bituı
S	STDOETS	STRONIE	26′′		LENGTH		URE	NCH	
CYLINDERS	A I C	DIA.	19″	FLUES		2" 14'	PRESS	ER SQ. IN	170
CYLI	TVPF		Simple 19"	FL	DIA.	2,	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	1
	T	4	Sin 181		NO.	246	BOI	PC A	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE ILLINOIS CENTRAL RAILROAD.

CODE WORD, QUOIFFURE.

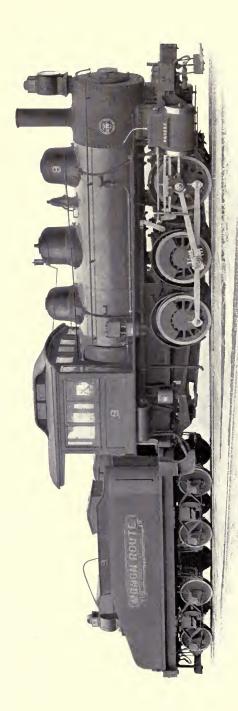
TYPE, 6-WHEELED SWITCHER.

CLASS, 19 H. SERIES, 667.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 3000 U. S. GALLONS AND 4½ TONS FUEL.

CYLII	CYLINDERS					5	WHEELS	S			BC	BOILER		FIRE BOX	BOX	
i da	-		TENDER	DER	TRAI	TRAILING	COUPL	COUPLED DRIVERS	S LEADING	DING	TVPF	F DIA		TVPF	navional manyari	WILLYEL
IXE	DIA.	SIKONE	NO.	DIA.	NO.	DIA.	NO.	DIA.	NO.	DIA.	111					117714
mple	Simple 19" 26" 8 33"	,92	∞	33″			9	51″	1.	1	Rad. St Straigh	Rad. Stay, Straight Top 62"		Long, Sloping	113" 34½"	343"
FLU	FLUES	-		=	THEE	WHEEL BASE	되		AVER	AGE	WEIGH	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	RKING	ORDER,	Pounds	
NO. DIA.	LENGTH	1	DRIVING		RIGID	EŅGINE		ENGINE AND TENDER	TENDER	TR	FRAILING	DRIVERS		LEADING	TOTAL	AI.
0 2″	220 2" 10'-7 ¹ / ₁₆ " 11'-0" 11'-0" 39'-3"	, e	11′-0′	1	,,0-,	11′-0	3	9'-3"	67000			114000			114000	000
ILER P	BOILER PRESSURE	XE.		FUEL			HE/	HEATING SURFACE, SQ. FT.	JRFACE,	So. F	T.	GRATE AREA		GAUGE OF TRACK	OF TR.	ACK
OUNDS PER SQ. INCE ABOVE ATMOSPHERE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE			KIND		<u> </u>	ELUES	FIRE BOX	ARCH PIPES	PES	TOTAL	SQUARE FEET	EET	METRES	FEET	INCHES
18	. 081	Щ	Situm	inous	s Co	Biruminous Coal 1209	209	146	•		1355	26		1.435	4'-8½"	× 100

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE CHICAGO, INDIANAPOLIS & LOUISVILLE RAILWAY. (Formerly L., N. A. & C.)

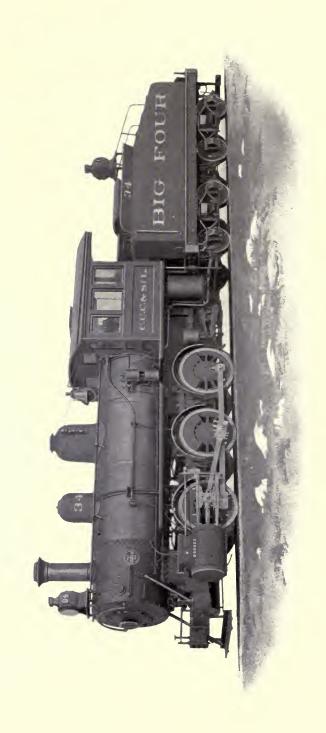
CODE WORD, QUOIN.

TYPE, 6-WHEELED SWITCHER.

Series, 603. Class, 19 H.

WITH S.WHEELED TENDER, SLOPING BACK, TANK CAPACITY 3500 U. S. GALLONS AND 5 TONS FUEL.

BOX	LENGTH WIDTH		$96\frac{1}{2}$ 32 $\frac{1}{2}$ "	Pounds	TOTAL	115500	OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	TVPE		Long	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING		GRATE AREA GAUGE OF TRACK	METRES	1.435
BOILER	DIA		Rad. Stay, Straight Top 60"	IN WORKI	DRIVERS	115500	RATE ARE	SQUARE FEET	21.2
BOL	TVPE		Rad. Stay Straight	WEIGHT	TRAILING			TOTAL	1326
	LEADING	NO. DIA.		AVERAGE	TENDER	20000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
S	COUPLED DRIVERS	DIA.	20′′		ENGINE AND TENDER		ATING SUI	FIRE BOX	137
WHEELS	_	DIA. NO.	9	BASE	ENGINE	11′-0″	HE	FLUES	1189
	TRAILING	NO.		WHEEL BASE	RIGID	11′-0″	FUEL	KIND	Bituminous Coal
	TENDER	NO. DIA.	8 33		DRIVING	11′-0″	FU	3	Bitumin
CYLINDERS		DIA. SIKONE	Simple 19" 24" 8 33"	TES	LENGTH	208 2" 11'-0\bar{1}" 11'-0" 11'-0" 41'-5"	BOILER PRESSURE	R SQ, INCH IOSPILERE	180
CYLIN	TUDE	IXFE	Simple	FLUES	NO. DIA.	208 2″	BOILER P	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	18



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898

FOR THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS RAILWAY.

CODE WORD, QUOIT.

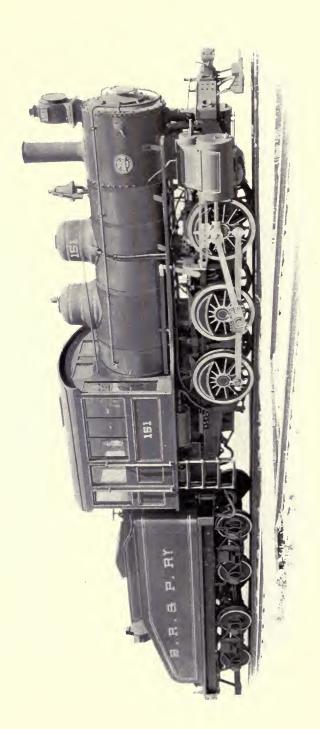
TYPE, 6-WHEELED SWITCHER.

CLASS, 19 H.

SERIES, 635.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 3500 U. S. GALLONS AND 5 TONS FUEL.

		-							
BOX	padam naswa i		103" 33\frac{3}{4}"	Pounds	TOTAL	109000	GAUGE OF TRACK	FEET INCHES	$4'-8\frac{1}{2}''$
FIRE BOX	ТУРЕ		Long	VG ORDER,	LEADING WHEELS		GAUGE	METRES	1.435
ER	DIA		op 601"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	109000	GRATE AREA	SQUARE FEET	23.5
BOILER	TVPF		Rad. Stay, $60\frac{1}{8}$	WEIGHT	TRAILING			TOTAL	1471
	LEADING	NO. DIA.		AVERAGE	TENDER	20000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
S	COUPLED DRIVERS	DIA.	20″		ENGINE AND TENDER		TING SUR	FIRE BOX	145
WHEELS		NO.	9	BASE	ENGINE ENG	'-0" 11'-6" 11'-6" 39'-3"	HEA	. FLUES	1326
	TRAILING	NO. DIA.		WHEEL BASE	RIGID	-6″ 1			Coal
	TENDER	DIA.	33″	W		" 11′	FUEL	KIND	Bituminous Coal
		NO.	∞		DRIVING	11′-6			Bitun
DERS	ariogra vid		19" 24"	S	LENGTH	11	ESSURE	SQ, INCH	
CYLINDER	TVDF		Simple 19"	FLUES	NO. DIA.	232 2"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	160
			40=			•			



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE BUFFALO, ROCHESTER & PITTSBURG RAILWAY.

CODE WORD, QUOIX.

SERIES, 662.

CLASS, 19 H.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 4000 U. S. GALLONS AND 5 TONS FUEL. TYPE, 6-WHEELED SWITCHER.

	Ŧ						25	
X(LENGTH WIDTH	97" 33"	NUNDS	TOTAL	108000	TRACK	FEET INCHES	4′-8½″
FIRE BOX	TYPE	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS		GAUGE OF TRACK	METRES	1.435
 	DIA.	28″	WORKIN	DRIVERS	108000	GRATE AREA	SQUARE FEET	21.7
BOILER	TYPE	Rad. Stay, Wagon Top	WEIGHT IN	FRAILING WHEELS			TOTAL	1431
	LEADING NO. DIA.		AVERAGE	TENDER W.	75000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
S.	COUPLED DRIVERS NO. DIA.	20′′		ENGINE AND TE		TING SUR	FIRE BOX	134
WHEELS		9	BASE	ENGINE T	1′-0″ 4	HE	FLUES	1297
	A. NO. DIA.		WHEEL BASE	RIGID	'-1\frac{1}{8}" 11'-0" 11'-0" 40'-8"	FUEL	KIND	Bituminous Coal
	E TENDER NO. DIA.	8 33″		DRIVING	11′-0″	FI	¥	Bitumin
CYLINDERS	DIA, STROKE	19" 24"	ES	LENGTII	=	RESSURE	SQ, INCH OSPHERE	0
CYLIN	TYPE	Simple Piston Valve	FLUES	NO. DIA.	225 2"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1899

FOR THE LAKE ERIE & WESTERN RAILROAD.

CODE WORD, QUOKE.

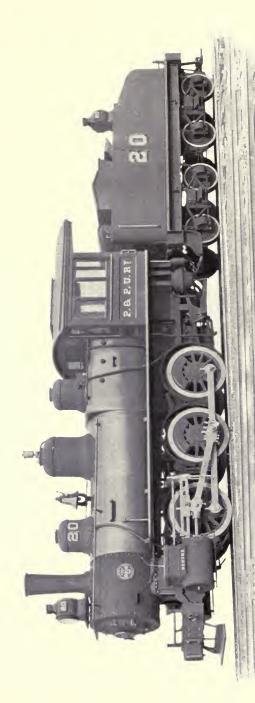
TYPE, 6-WHEELED SWITCHER.

CLASS, 18 H.

SERIES, 689.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 4000 U. S. GALLONS AND 4½ TONS FUEL.

		WIDTH	33″		NE	000	CK	INCHES	<u> </u>
BOX		LENGIH WIDTH		Pounds	TOTAL	110600	OF TRA	FEET	4′-8½″
FIRE BOX	TVDE	IXFE	Long	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING		A GAUGE OF TRACK	METRES	1.435
3R	A I C	DIA.	, 56"	N WORKI	DRIVERS	110600	GRATE AREA	SQUARE FEET	18.6
BOILER	TVDE	INFE	Crown Bar, Wagon Top	WEIGHT D	TRAILING WHEELS			TOTAL SC	1350.6
	LEADING	NO. DIA.		AVERAGE	TENDER V	76000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS	DIA.	20″		ENGINE AND TENDER		ING SUR	FIRE BOX	124
WHEELS	COUPLED	NO.	9	SE		-1½" 11'-0" 11'-0" 40'-1"	HEAT	FLUES	9.922
	TRAILING	DIA.	1	WHEEL BASE	ENGINE	11/-			al 1
	TRA	NO.		WHE	RIGID	11'-0"	SI.	Q	Bituminous Coal 1226.6
	TENDER	DIA.	33″		ING	.0	FUEL	KIND	ımino
		NO.	∞ .		DRIVING	11′-			Bitt
RS	HAUGUS		24″		LENGTH		SURE	INCH	
CYLINDERS	A 1CI	0.0	18,	FLUES	DIA. I	1	PRES	OUNDS PER SQ. INCH ABOVE ATMOSPHERE	165
CVL	TVPE		Simple 18"	E	NO. DI	213 2" 11'	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

1898

FOR THE PEORIA & PEKIN UNION RAILWAY.

FOR THE CODE WORD, QUOLLEG.

TYPE, 6-WHEELED SWITCHER.

SERIES, 636.

CLASS, 18 H.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 3100 U. S. GALLONS AND 31 TONS FUEL.

	IDTH		33″		[4]	00	CK	INCHES	
×	FNCTH WIDTH		84" 3	INDS	TOTAL	109000	TRA	FEET IN	4'-83"
FIRE BOX	- 1		ò	3, Pot			E OF		
FIR	TVPF		Long	ORDEI	LEADING		GAUGE OF TRACK	METRES	1.435
	-	•	٦	ING	W	•			
	PIA	DIA.	26′′	WORK	DRIVERS	109000	GRATE AREA	SQUARE FEET	18.6
BOILER	Ĺ	1	ved	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRI	109	GRAT	sou	
BC	TVDE	111	Improved Belpaire	EIGH	ING			TOTAL	1220
	rh	Α.		E W.	TRAILING		FT.		12
	LEADING	. DIA.		ERAC	M	0	CE, So	ARCH PIPES	
		NO.		AI	TENDER	65000	IRFA	ARC	
	COUPLED DRIVERS	DIA.	52"		AND		HEATING SURFACE, SQ. FT.	FIRE BOX	122
ELS	PLED D	NO.	9		ENGINE AND TENDER	38′-2	EATH	<u> </u>	
WHEELS		Z		ASE	ENGINE	-1½" 11'-0" 11'-0" 38'-2"	Ξ	FLUES	1098
	TRAILING	DIA.	-	EL B	ENG	1			oal
	TRA	NO.		WHEEL BASE	RIGID	1′-0″	T		Bituminous Coal
	TENDER	DIA.	8 33″		5)″ 1	FUEL	KIND	mino
		NO.			DRIVING	11′-0			Bitu
	0.00	SIKOKE	24"		СТН	11.	URE	CH	
CYLINDERS		DIA.	18″	ES	LENGTH	11′-	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	Ñ
CVLIN	1	4	Simple 18"	FLUES	DIA,	190 2" 11'	ER P	NDS PER	165
	TVDE	1 1	Sim		NO.	190	BOIL	POU	
			193						

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898 FOR THE ST. LOUIS NATIONAL STOCK YARDS.

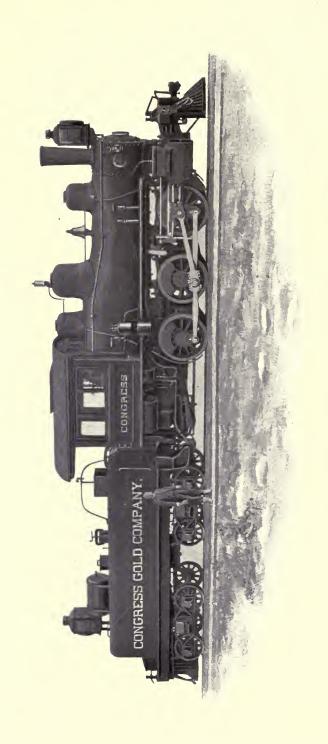
CODE WORD, QUONDAM.

TYPE, 6-WHEELED SWITCHER.

SERIES, 678. CLASS, 18 H.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 2500 U. S. GALLONS AND 4 TONS FUEL.

CYLI	CYLINDERS					11	WHEELS	S			BOILER	~	FIRE BOX	BOX	
TVDE		1	TENDER	ER	TRAILING	_	COUPLE	COUPLED DRIVERS	LEADING	NG	TVPF	DIA	TVPF	nadia nabasi	Hadim
IXE	DIA. SIK	STROKE	NO. I	DIA.	NO.	DIA.	NO.	DIA.	NO.	DIA.	7117	Dia.	7111	LENGIN	HIGH
Simple 18"		24″	8 33″	1			9	20′′	1	- Str	Crown Bar, Straight Top	26′′	Long	84″	33″
FL	FLUES			M	HEEL	WHEEL BASE	3		AVER	AGE WE	SIGHT IN	WORKIN	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pounds	
NO. DIA.	LENGTH		DRIVING	R	RIGID	ENGINE		ENGINE AND TENDER	TENDER	TRAILING		DRIVERS	LEADING	TOTAL	AL
200 2" 11'-)	$11'-1\frac{1}{16}$	1	1′-0″	11	,,0-,	11′-0	$1\frac{1}{16}$ " 11'-0" 11'-0" 38'-5"		62000		- 10	106000		106	000901
OILER	BOILER PRESSURE	且	Ţ	FUEL			HEA	HEATING SURFACE, SQ. FT.	RFACE,	30. FT.	GRA	GRATE AREA	A GAUGE OF TRACK	OF TR	ACK
POUNDS PE ABOVE AT	POUNDS PER SQ. INCH ABOVE ATMOSPHERE			KIND		E	FLUES	FIRE BOX	ARCH PIPES	ES TOTAL	-	SQUARE FEET	METRES	FEET	INCHES
-	165	B	itumi	noui	s Coa	Bituminous Coal 1153	153	119		12'	1272	18.7	1.435	4′-8½″	31"



OIL BURNING LOCOMOTIVE.

BUILT BY

BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1896

SERIES, 584. CLASS, 17 H.

FOR THE CONGRESS GOLD COMPANY.

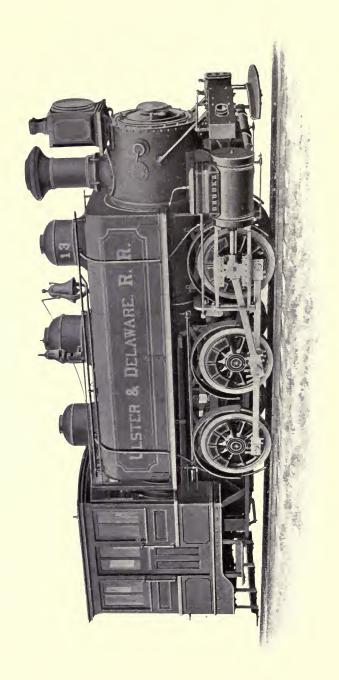
TANK CAPACITY 3600 U. S. GALLONS AND 5 TONS FUEL (OIL).

TYPE, 6-WHEELED SWITCHER. WITH 8-WHEELED TENDER

CODE WORD, QUOPLIN.

ENGINE TENDER TENDER	RIGID E	DRIVING
-8" ING SU	HEATING SURFACE, SQ. FT. FLUES FIRE BOX ARCH 11PES TO	CHE FUEL HEATING KCH KIND FLUES FIRE

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1885 FOR THE ULSTER & DELAWARE RAILROAD.

CODE WORD, QUOPPET.

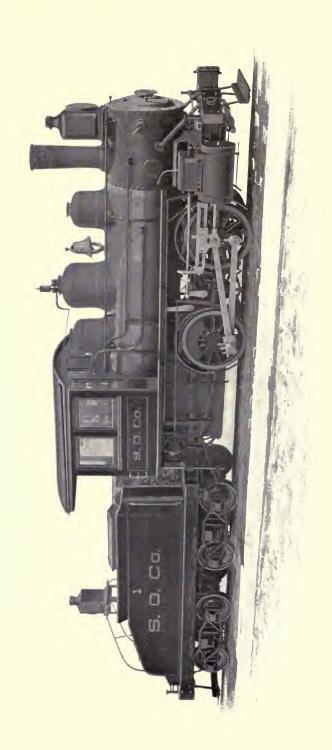
TYPE, 6-WHEELED SADDLE TANK SWITCHER.

Series, 208. Class, 17 H. T.

TANK CAPACITY 1000 U. S. GALLONS AND 1 TON FUEL.

	I		_					S	
	TOLM		34"		AL	00	ACK	INCHES	25/27 25/27
X	FNGTH WIDTH		,,96	SUNDS	TOTAL	84000	GAUGE OF TRACK	FEET	$4'-8\frac{1}{2}''$
FIRE BOX			0,	γ, Pc			OF		
FIRI	H.		s, ing	RDEI	LEADING	1	AUGI	METRES	1.435
	TVPE		Long, Sloping	G 01	LEA	ı		N	
				KIN			GRATE AREA	ET	
	DIA		Crown Bar, 50" Straight Top	WOR	DRIVERS	84000	re a	SQUARE FEET	22.6
BOILER			Bar, Top	Z	DRI	84	GRA	sou	
BOI	TVPF		wn J ight	GHT					4
			Crc	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	FRAILING		Ĕ.	TOTAL	791.4
	NG	DIA.	-	\GE	T. X		SQ. F	ES	
	LEADING	NO.		VER.	ER	1	CE,	ARCH PIPES	
		2		A	TENDER		IRFA	AR	
	COUPLED DRIVERS	DIA.	44″		g.		HEATING SURFACE, SQ. FT.	FIRE BOX	74
κί	ED DR				ENGINE AND TENDER		TIN	FIR	
WHEELS	OUPL	NO.	9		ENG	_	HE/	ES	4.7
WI	_			WHEEL BASE	ENGINE	,0-,(FLUES	717.4
	TRAILING	DIA.		EL E		7			al
	TR	NO.		WHE	RIGID	0,-0	٦		CC
	DER	DIA.	1			<u></u>	FUEL	KIND	acit
	TENDER	NO.			DRIVING	10′-0″ 10′-0″ 10′-0″			Anthracite Coal
	1	SIRONE	24″				F		4
RS					LENGTH	,8-,6	SUR	INCH	
CYLINDERS		DIA.	Simple 17"	FLUES			BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	135
CYLI	DE	1 5	ple	FL	DIA.	7	ER	OVE AT	
	TVDE	1	Sim		NO.	143	BOII	POL	

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

DUNKIRK, N. Y., U.S.A. 1891

FOR THE STANDARD OIL COMPANY.

SERIES, 421. CLASS, 17 E.

CODE WORD, QUORAM.

TYPE, 4-COUPLED SWITCHER.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 2500 U. S. GALLONS AND 4 TONS FUEL.

BOX	LENGTH WIDTH	72" 34"	Pounds	TOTAL	78000	OF TRACK	FEET INCHES	4'-81"
FIRE BOX	TYPE	Deep	G ORDER,	LEADING		GAUGE OF TRACK	METRES	1.435
BOILER	DIA.	t 54"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	78000	GRATE AREA	SQUARE FEET	16.3
BOL	TYPE	Straight	E WEIGHT	TRAILING	-		TOTAL	1173
	LEADING NO. DIA.		AVERAG	TENDER	62000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
STS	COUPLED DRIVERS NO. DIA.	. 50″		ENGINE AND TENDER	34'-3"	LATING SU	FIRE BOX	102
WHEELS		4	WHEEL BASE	ENGINE	,,0-,,	H	FLUES	1 1071
	TRAI	3″ –	WHEEI	RIGID	,,0-,,	FUEL	KIND	Bituminous Coal 1071
	TENDER NO. DIA.	8 %		DRIVING				Bitumir
CYLINDERS	DIA, STROKE	Simple 17" 24" 8 33"	FLUES	LENGTH	186 $2''$ $11'-1\frac{1}{16}''$ $7'-0''$ $7'-0''$ $34'-3''$	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	165
CYLI	TYPE	Simple	FL	NO. DIA.	186 2"	BOILER 1	POUNDS PE ABOVE AT	16

201



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1893 FOR THE CARNEGIE STEEL COMPANY.

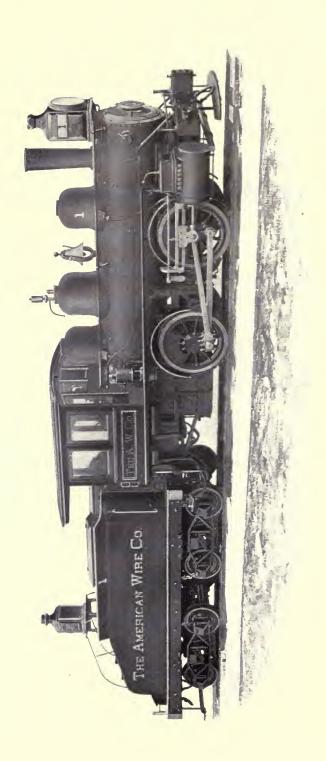
CODE WORD, QUOTA.

TYPE, 4-WHEELED SWITCHER.

Series, 490. Class, 16 E.

WITH 8-WHEELED TENDER, SLOPING BACK TANK, CAPACITY 2500 U. S. GALLONS AND 4 TONS FUEL.

	CYLI	CYLINDERS				W	WHEELS				BC	BOILER		FIRE BOX	BOX	
	TVPE	DIA.	STROKE	TENDER	TRAILING	_	OUPLEL	COUPLED DRIVERS		LEADING						
				NO. DIA.	NO.	DIA.	NO.	DIA.	NO.	DIA.	TAFE		DIA.	TYPE	LENGTH	LENGTH WIDTH
203	Simple 16"	16″	24″	8 30″		1	4	20″			Rad. Stay, Straight Top 52"	tay,	52″	Deep	,,99	$66'' 34\frac{1}{2}''$
	FLI	FLUES			WHEEL BASE	, BASE			AVEF	RAGE	WEIGH	V NI T	VORKING	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pound	
Z	NO. DIA.	LENGTH		DRIVING	RIGID	ENGINE	ENGIN	ENGINE AND TENDER	TENDER	TR	TRAILING	DRIVERS	ERS	LEADING WHEELS	TOTAL	AL
1(164 2"	=	.1″	['-1" 7'-0" 7'-0" 35'-6"	,,0-,,	7′-0″	35,	,,9-	000009			72500	00		725	72500
ğ	BOILER PRESSURE	RESSU	RE	FUEL	EL		HEAT	ING SU	HEATING SURFACE, SQ. FT.	SQ. F	T.	GRATI	GRATE AREA	GAUGE OF TRACK	OF TR	ACK
	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	R SQ, INC MOSPHERE	H	KIND	ND	FLUES	TES	FIRE BOX	ARCH PIPES	IPES	TOTAL	SQUAF	SQUARE FEET	METRES	FEET	INCHES
	15	150		Bituminous Coal	ous Coa	1 956	9	95			1051	=	15.2	1.435	4'-81"	\$\frac{1}{2}''



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

1890

FOR THE AMERICAN WIRE COMPANY.

CODE WORD, QUOTANT.

TYPE, 4-WHEELED SWITCHER.

DTANT.

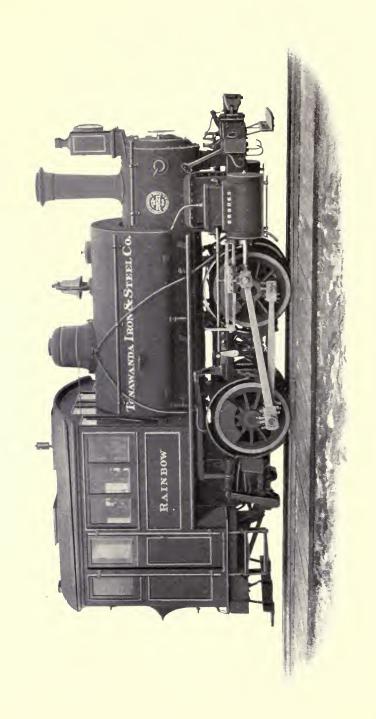
SWITCHER.

WITH 8-WHEELED TENDER, SLOPING BACK, TANK CAPACITY 2500 U. S. GALLONS AND 4 TONS FUEL.

SERIES, 381. CLASS, 16 E.

BOX	LENGTH WIDTH	48" 34½"	Pounds	TOTAL	58200	GAUGE OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	TYPE	Deep	G ORDER,	LEADING WHEELS			METRES	1.435
ER	DIA.	t 46"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	58200	GRATE AREA	SQUARE FEET	11.1
BOILER	TYPE	Straight	WEIGHT	TRAILING			TOTAL	778
	LEADING NO. DIA.		AVERAGE	TENDER	92000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
ST	COUPLED DRIVERS NO. DIA.	20″		ENGINE AND TENDER		ATING SUI	FIRE BOX	63
WHEELS		4	BASE	ENGINE	7,-0,,	HE	FLUES	715
	TRAILING NO. DIA.		WHEEL BASE	RIGID	,,0-,,	1		is Coal
	TENDER NO. DIA.	∞		DRIVING	-11" 7'-0" 7'-0" 23'-10"	FUEL		Bituminous Coal
RS	STROKE	, 22″		LENGTH		SURE	INCH	
CYLINDERS	TYPE DIA.	Simple 16"	FLUES	NO, DIA, LE	126 · 2" 10'	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	150
		205						,

FOR HAULING CAPACITY SEE PAGE 290.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

NKIKK, N. Y., U.S.A. 1895

FOR THE TONAWANDA IRON & STEEL COMPANY.

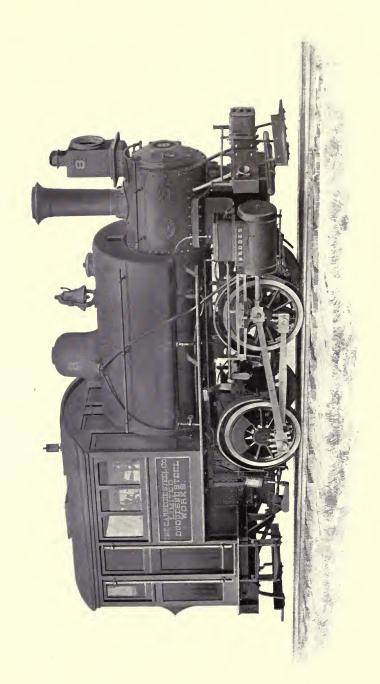
CODE WORD, QUOTH.

TYPE, 4-WHEELED SADDLE TANK SWITCHER.

Series, 564. Class, 18 E. T.

TANK CAPACITY 900 U. S. GALLONS AND 13 TONS FUEL.

		ТН	1				1	S	T
		I WID	35"	- 80	TOTAL	76000	ACK	INCHES	S31 // S22
BOX		LENGTH WIDTH	48″	Pount	TO	76	OF TR	THE	$4'-8\frac{1}{2}''$
FIRE BOX		ТУРЕ	Deep	G ORDER,	LEADING WHEELS		GAUGE OF TRACK	METRES	1.435
BOILER	3 DIA.		Crown Bar, 48" StraightTop	AVERAGE WEIGHT IN WORKING ONDER, POUNDS	DRIVERS	76000	GRATE AREA	SQUARE FEET	11.3
BO	TYPE		Crown Straight	E WEIGHT	TRAILING			TOTAL	778
	LEADING	DIA.		RAGI			, So.	TPES	
	LEA	NO.		AVE	TENDER		FACE	ARCH PIPES	
	COUPLED DRIVERS	DIA.	88′				HEATING SURFACE, SQ. FT.	FIRE BOX	29
WHEELS	OUPLED	NO,	4		ENGINE AND TENDER		HEAT		
WF	-	DIA.	-	WHEEL BASE	ENGINE	,,0-,,		FLUES	711
	TRAILING	NO. D		EEL			FUEL	KIND	Coal
				WH	RIGID	7′-0′) snc
	TENDER	DIA.			SNI	0			Bituminous Coal
SS		NO.			DRIVING	7			Bitu
	STROKE		24″		ТН	$0 rac{1}{16}^{\prime\prime}$	URE	CH E	
CYLINDERS	DIA		Simple 16" 24"	FLUES	LENGTH	126 2" 10'-10 ^{1,6} " 7'-0" 7'-0" 7'-0"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	35
CVLL	o 月		ple	FLU	DIA.	2	ER P	NDS PEI	165
	TYPE		Sim		NO.	126	BOIL	POUR	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A. BUILT BY

FOR THE CARNEGIE STEEL COMPANY.

CODE WORD, QUOTIDIAN.

TYPE, 4-WHEELED SADDLE TANK SWITCHER.

CLASS, 16 E. T. SERIES, 543.

TANK CAPACITY 900 U. S. GALLONS AND 13 TONS FUEL.

		1				7	1	т —					
	LENGTH WIDTH	48" 34½"		_ H	0	CK	INCHES						
	TH.		NDS	TOTAL	20009	FRA		4'-81"					
BOX	LENG	48	Pour		1-	OF 7	FEET	4					
FIRE BOX			ER,	15		GAUGE OF TRACK	ES	N					
FI	TYPE	Deep		LEADING		AU	METRES	1.435					
	T	Q	g G	LE									
			KIN			REA	TH						
	DIA.	⁷⁸	WOF	DRIVERS	00	E A	SQUARE FEET	11.1					
ER		ar,	Z	DRIV	26000	GRATE AREA	SQUA						
BOILER	TYPE	n Ba	AVERAGE WEIGHT IN WORKING ORDER, POUNDS			Ö	1						
	Ţ	Crown Bar, Straight Top 48"	EIG	ING			TOTAL	778					
		Ow	M 3	TRAILING		FT.	TO	7					
	ING DIA.		AGI			So.	PES	-					
	LEADING NO. DIA		VER	ER		CE,	ARCH PIPES						
	- 1	'	A	TENDER		RFA	AR						
	COUPLED DRIVERS NO. DIA.	48″				HEATING SURFACE, SQ. FT.	BOX	7					
	DRI	4		GINE ANI FENDER		ING	FIRE BOX	67					
ELS	UPLEI NO.			ENGINE AND TENDER	1	EAT							
WHEELS	COU	4	回			H	FLUES	711					
-	JNG DIA.		WHEEL BASE	ENGINE	/,0-/		ţz.						
			EL			1		oal					
	TRA NO.		VHE	RIGID	,0-	. 1		s C					
	DER DIA.				7	FUEL	KIND	Bituminous Coal					
	TENDER NO. DIA.	1							DRIVING	.0,	14		umi
ERS	Z			DRI	1			Bit					
	STROKE	24″		LENGTH	-10" 7'-0" 7'-0"	RE	H						
	DIA. 8		7.0		- 01	SSO	P. INCI						
CYLINDERS	DI	16	FLUES	А.		PRE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	165					
CYL	PE	ple	FI	DIA.	,	ER	NDS P	1					
	TYPE	Simple 16"		NO.	126 2" 10'	BOILER PRESSURE	POU						
		-											



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1892 FOR THE STUDEBAKER BROS M'F'G COMPANY.

CODE WORD, QUOTIENT.

TYPE, 4-WHEELED SADDLE TANK SWITCHER.

TANK CAPACITY 700 U. S. GALLONS AND 1 TON FUEL.

Series, 451. Class, 14 E. T.

		WID	35	
BOX		LENGIH WID	42″	Pounds
FIRE BOX	TVDE	7117	Crown Bar, 44" Deep 42" 35	AVERAGE WEIGHT IN WORKING ORDER, POUNDS
	414	DIA.	44″	WORK
BOILER	TVDE	7717	Crown Bar, Straight	WEIGHT IN
	DING	DIA.	1	RAGE
	LEAL	NO. DIA.		AVE
	TENDER TRAILING COUPLED DRIVERS LEADING	DIA.	4 42½"	
WHEELS	COUPLED	NO.		SE
	LING			WHEEL BASE
}	TRAI	NO.		WHEE
	IDER	NO, DIA, NO, DIA.		
œ	DIA		22″	
CYLINDERS	410		14″	FLUES
CYLI	TVPE		Simple 14" 22" — — — —	FL

DTH

à

TOTAL

LEADING

DRIVERS

TRAILING

TENDER

ENGINE AND TENDER

ENGINE

RIGID

DRIVING

LENGTH

DIA.

7′-0″

2" 10'-10" 7'-0" 7'-0"

150

FOR HAULING CAPACITY SEE PAGE 290.

FEET INCHES

METRES

SQUARE FEET

TOTAL

ARCH PIPES

FIRE BOX

FLUES

KIND

POUNDS PER SQ. INCH ABOVE ATMOSPHERE $4'-8\frac{1}{2}''$

1.435

9.7

099

64

596

Bituminous Coal

120

GAUGE OF TRACK

GRATE AREA

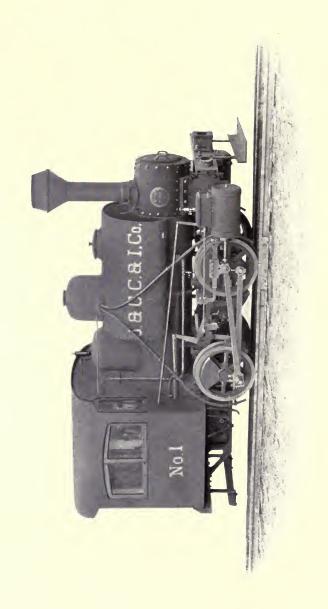
HEATING SURFACE, SQ. FT.

FUEL

BOILER PRESSURE

00009

00009



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE JEFFERSON & CLEARFIELD COAL & IRON COMPANY.

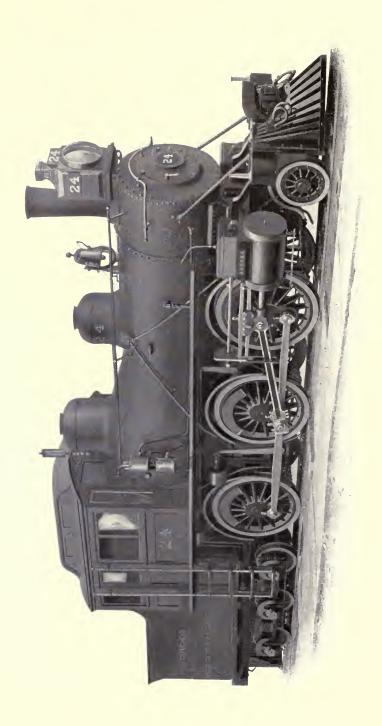
CODE WORD, QUOTIX.

TYPE, 4-WHEELED SADDLE TANK SWITCHER.

Series, 598. Class, 8 E. T.

TANK CAPACITY 200 U. S. GALLONS AND ½ TON FUEL.

30X	LENGTH WIDTH	$30\frac{1}{2}''$ $38''$	Pounds	TOTAL	23000	GAUGE OF TRACK	FEET INCHES	4'-8½"
FIRE BOX	TYPE	Deep	G ORDER, 1	LEADING			METRES	1.435
BOILER	PE DIA.	Direct Stay Straight Top 26"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	23000	GRATE AREA	SQUARE FEET	7.5
B	TYPE	Direct Straig	WEIGH	TRAILING		FT.	TOTAL	169
	LEADING NO. DIA.		AVERAGE	TENDER		HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS NO. DIA.	30″		ENGINE AND TENDER		FING SUR	FIRE BOX	28
WHEELS	COUPLE NO.	4	SE		8	HEA	FLUES	141
	TRAILING		WHEEL BASE	ENGINE	4			oal
			WHE	RIGID	/88	FUEL	KIND	ons C
	TENDER NO. DIA.			DRIVING	4'-8" 4'-8" 4'-8"	FU	KI	Bituminous Coal
SS	STROKE	12″		LENGTH	'-2 ⁷ "	SURE	NCH	
CYLINDERS	DIA.	°×	FLUES		7	PRESS	ER SQ. II	180
CVL	TYPE	Simple 313	FL	NO. DIA.	$50 1\frac{1}{2}$	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	1



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1893

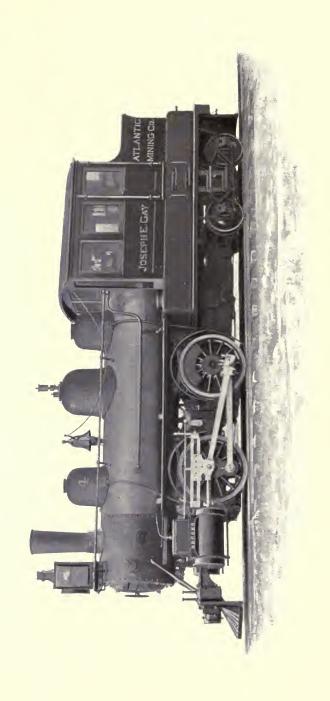
FOR THE CHICAGO & NORTHERN PACIFIC RAILROAD.

TYPE, 6-COUPLED DOUBLE ENDER TANK ENGINE. CODE WORD, QUOTOON.

CLASS, 18 B. R. X. SERIES, 487.

REAR TANK, CAPACITY 2600 U. S. GALLONS AND 4½ TONS FUEL.

	CYLINDERS	DERS					WHEELS	Ş			BO	BOILER		FIRE BOX	BOX	
	-			TENDER	TRA	TRAILING	COUPL	COUPLED DRIVERS		LEADING	TVPF	DIA	_	TVPE	I ENGTH WIDTH	WIDTH
IYEE		DIA, STROKE	NO.	DIA.	NO.	DIA.	NO.	DIA.	NO.	DIA.			_			
Simp	e	Simple 18" 24"		1	9	30″	9	63″	2	30″	Crown Bar, Wagon Top	Bar, 58" Fop		Long, Sloping	102" 33"	33″
	FLUES	Si			WHEE	WHEEL BASE	SE		AVE	RAGE	WEIGHT	IN WO	RKING	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pounds	
Ö	DIA.	LENGTH	DRIVING	D _N	RIGID	ENGINE	-	ENGINE AND TENDER	TENDER	TR	FRAILING	DRIVERS		LEADING WHEELS	TOTAL	TOTAL
250	2	2" 11'-1" 15'-0" 15'-0" 35'-9"	15′-(0″ 1	2′-0″	35′-	.9″			4	48000	102000		16000	166	166000
BOILI	SR PR	BOILER PRESSURE		FUEL	Ţ		HEA	HEATING SURFACE, SQ. FT.	RFACE,	So. F		GRATE AREA	AREA	GAUGE OF TRACK	OF TR	ACK
POUN	POUNDS PER SQ. INCE ABOVE ATMOSPHERE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE		KIND	0		FLUES	FIRE BOX	ARCH PIPES	TPES	TOTAL	SQUARE FEET	THEF	METRES	FEET	INCHES
ļ	180		Bitu	mino	Bituminous Coal 1453	al	1453	144	23		1620	22.6	3	1.435	4′-8	4'-8½"



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., C.S.A. 1890

CODE WORD, QUOTUM.

FOR THE ATLANTIC MINING COMPANY.

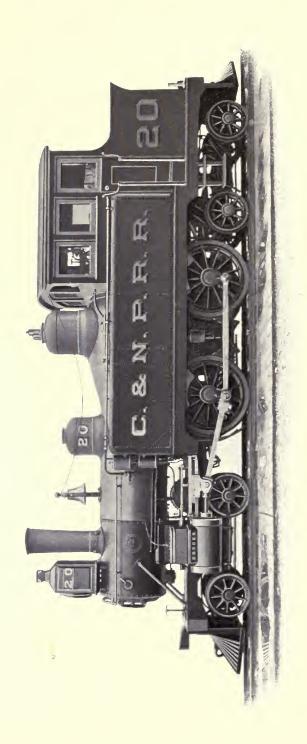
SERIES, 394.

CLASS, 16 E. Q. X.

TYPE, 4-COUPLED, "FORNEY," TANK ENGINE.

REAR TANK, CAPACITY 1120 U. S. GALLONS AND 3 TONS FUEL.

BOX	LENGTH WIDTH	72" 34½"	Pounds	TOTAL	00806	GAUGE OF TRACK	FEET INCHES	4'-1"
FIRE BOX	TYPE	Deep	G ORDER,	LEADING			METRES	1.244
BOILER	E DIA.	ght 52"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	00889	GRATE AREA	SQUARE FEET	16.3
BC BC	TYPE	- Straight	E WEIGHT	TRAILING	22000	FT.	TOTAL	066
	LEADING NO. DIA.		AVERAG	TENDER		HEATING SURFACE, SQ. FT.	ARCH PIPES	
S	COUPLED DRIVERS NO. DIA.	20″		ENGINE AND TENDER		TING SUR	FIRE BOX	91
WHEELS		4	BASE	ENGINE T	22′-0″	HEA	FLUES	899
	TRAILING NO. DIA.	4 30″	WHEEL BASE	RIGID	3'-6" 2	L		us Coal
	TENDER NO. DIA.			DRIVING	,,9-,9 ,,9-,9	FUEL	KIND	Bituminous Coal
DERS	DIA. STROKE	16" 24"	3S	LENGTH	$1\frac{1}{16}$	ESSURE	SQ, INCH	
CYLINDERS	TYPE	Simple 16″	FLUES	NO, DIA,	156 2" 11'-	BOILER PRESSURE	POUNDS FER SQ, INCH ABOVE ATMOSPHERE	165



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

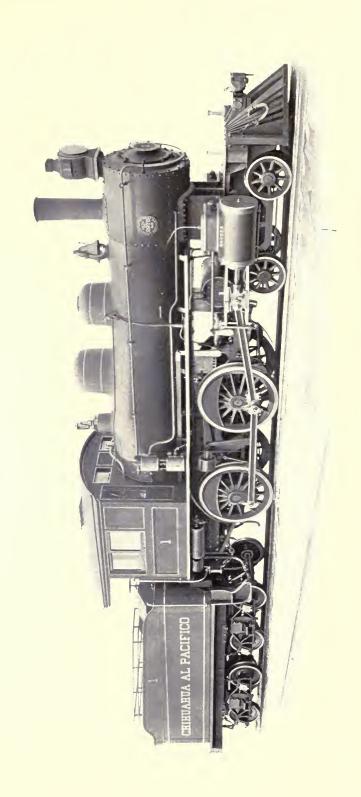
FOR THE CHICAGO & NORTHERN PACIFIC RAILROAD.

TYPE, 4-COUPLED, DOUBLE ENDER, TANK ENGINE. CODE WORD, QUOTUOR.

CLASS, 15 A. Q. Y. **SERIES**, 395.

SIDE TANKS, CAPACITY 1600 U. S. GALLONS AND 3 TONS FUEL.

		HIDIN	34″		ıΞ	00	CK	INCHES	Šky
BOX		LENGIR WIDIN	84″	Pounds	TOTAL	100000	OF TRA	FEET IN	4'-8½"
FIRE BOX	TATOR	7117	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	23000	A GAUGE OF TRACK	METRES	1.435
~	1	Dia.	, 46″	WORKI	DRIVERS	26000	GRATE AREA	SQUARE FEET	19.6
BOILER	5147774	1	n Bar, 1 Top	IT IN	Id	ιχ.	GRA	òs	
H	1	x T	Crown Bar, Wagon Top	WEIGH	TRAILING	21000	FT.	TOTAL	992
	LEADING	DIA.	30″	RAGE	H.	(4	. So. 1	IPES	1
	LEA	NO.	4	AVE	TENDER		FACE	ARCH PIPES	
	COUPLED DRIVERS	DIA.	57"				HEATING SURFACE, SQ. FT.	FIRE BOX	112
WHEELS	JPLED I	NO.	4		ENGINE AND TENDER		IEATI		
WHI	_	1		ASE	ENGINE	,,9-,1	I	FLUES	654
	TRAILING	DIA.	30	WHEEL BASE	E	8			-Ea
	TK	NO.	4	WHE	RIGID	7'-0" 7'-0" 28'-6"	EL	ćĐ	Coke or Coal
	TENDER	DIA.			NG),	FUEL	KIND	oke o
		E NO.			DRIVING	1/-(Ŭ
S		STROKE	Simple 15" 22"		LENGTH	2" 9'-0"	SURE	NCH RE	
CYLINDERS		DIA.	15″	FLUES		6	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	165
CYLI		TYPE	ple	FL	DIA.	2	LER 1	JNDS PE	
		TX	Sim		NO	140	BOII	POU	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S A.

1898

FOR THE CHIHUAHUA & PACIFIC RAILROAD.

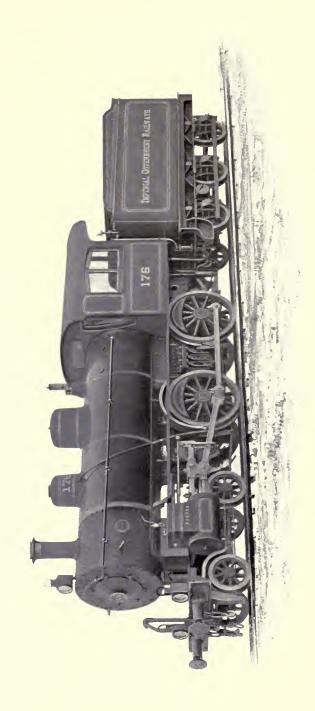
SERIES, 659.

TYPE, 8-WHEELED PASSENGER. CODE WORD, YABYAN.

WITH 8-WHEELED TENDER

CLASS, 18 A. TANK CAPACITY 4000 U. S. GALLONS AND 8 TONS FUEL.

		н	3"				×	TES	
		1 ×	33″	S(TOTAL	105500	RAC	INCHES	4'-8\frac{1}{2}"
30X		LENGIH MIDIH	97″	Pouni	TEN	10)F T	FEET	4
FIRE BOX	Trype		Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	37000	A GAUGE OF TRACK	METRES	1.435
		DIA.	26″	WORK	DRIVERS	68500	GRATE AREA	SQUARE FEET	21.8
BOILER			ay, Top	Z	DRJ	89	GRA'	sou	
BO	TYDE		Rad. Stay, Wagon Top	WEIGHT	FRAILING		T.	TOTAL	1490
	ING	DIA.	30″	AGE			So. 1	ES	
	LEADING	NO.	4	AVER	TENDER	80000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	ERS	DIA.	62″		T.	00	SUR	BOX	4
	DRIV	IG	9		ENGINE AND TENDER	_0′	ING	FIRE BOX	134
WHEELS	COUPLED DRIVERS	NO.	4		ENGINE AT	_× 8	IEAT		"
WHE	COL	Z		SE	E Z	,6 <u>-</u>		FLUES	1356
	TRAILING	DIA.		L BA	ENGINE	22′.			<u>5</u>
	TRAI	NO.	1	WHEEL BASE	RIGID	$-7\frac{1}{8}$ 8'-0" 8'-0" 48'-6"	1		Oak or Mesquite
	TENDER	DIA.	33″				FUEL	KIND	or M
	TEN	NO.	∞		DRIVING	8′-0′			Oak
SO.	a distribution	SINONE	24″		LENGTH	-7 <u>1</u> ″	URE	СН	
DER		. DIA	18″	ES	LEN		ESS	SQ. IN DSPHER	0
CYLINDERS			e	FLUES	DIA.	2″	CR PF	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
C	TVDE	1111	Simple 18"		NO.	225 2" 11'	BOILER PRESSURE	POUNI	
			221	1				-	-



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A. BUILT BY

FOR THE IMPERIAL GOVERNMENT RAILWAYS, JAPAN.

CODE WORD, YACCA.

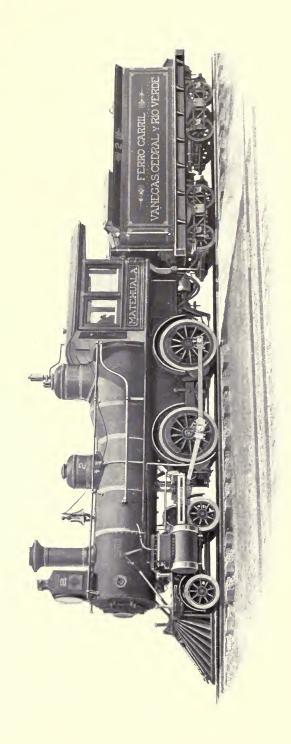
TYPE, 8-WHEELED PASSENGER.

SERIES, 626. CLASS, 15 A.

WITH 6-WHEELED TENDER

TANK CAPACITY 2400 U. S. GALLONS AND 31 TONS FUEL.

SOX	LENGTH WIDTH		$78'' 29\frac{1}{2}''$	SOUNDS	TOTAL	74500	GAUGE OF TRACK	FEET INCHES	3′-6″
FIRE BOX	TYPE		Long, Wide, $78''$ $29\frac{1}{2}$ " Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	24100		METRES	1.067
K.	DIA		p 54" L	N WORKIN	DRIVERS	50400	GRATE AREA	SQUARE FEET	15.2
BOILER	TVPE		27½" Rad. Stay, Straight Top	WEIGHT II	TRAILING			TOTAL	1004.9
	ING	DIA.	271."	AGE	T.R.		So. F	PES	
	LEADING	NO.	4	AVER	TENDER	52000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	VERS	DIA.	54″				SUR	FIRE BOX	89.9
ST	COUPLED DRIVERS	_			ENGINE AND TENDER	3'-10\frac{1}{2}	ATINC	FIRE	8
WHEELS	COUPL	NO.	4	3E		4″ 38	HE	FLUES	915
	ING	DIA.	1	L BAS	ENGINE	19′-			
	TRAILING	NO.		WHEEL BASE	RIGID	,,0-,,	د		Bituminous Coal, Japanese
	TENDER	DIA.	$35\frac{1}{2}''$				FUEL	KIND	minous C. Japanese
		NO.	9		DRIVING	7′-0′			Bitun
S	0	STROKE	Simple 15" $22''$ 6 $35\frac{1}{2}$ "		LENGTH	210 $1\frac{3}{4}$ " $9'-7\frac{1}{16}$ " $7'-0$ " $7'-0$ " $19'-4$ " $38'-10\frac{1}{2}$ "	URE	NCH	
NDER		DIA.	15"	JES		9′-′	RESS	R SQ. IN	091
CYLINDERS	-	7 7	ple	FLUES	DIA.	13″	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	16
		IYE	Sim		NO.	210	BOIL	POU	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1890

FOR THE VANEGAS, CEDRAL & RIO VERDE RAILROAD OF MEXICO.

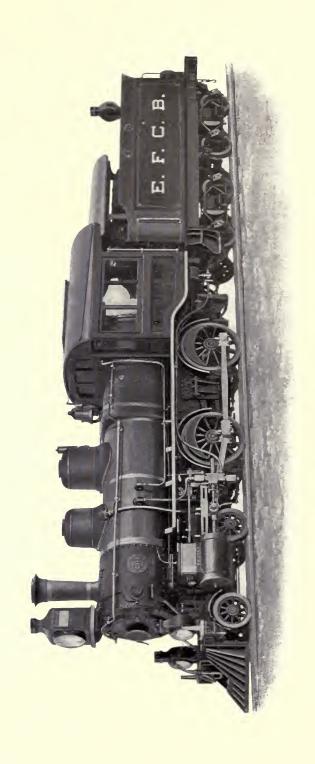
SERIES, 366.

TYPE, 8-WHEELED PASSENGER. CODE WORD, YACHT.

WITH 8-WHEELED TENDER

CLASS, 15 A. TANK CAPACITY 2400 U. S. GALLONS AND 5 TONS FUEL.

	LENGTH WIDTH	84" 24"	SO	TOTAL	65000	RACK	INCHES	3′-0″
BOX	LENGT	***************************************	Pouni	TC EN	65	OF TI	FRET	3
FIRE BOX	TYPE	Long, Wide, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	17000	SA GAUGE OF TRACK	METRES	.915
3R	DIA.	3, 48"	N WORK	DRIVERS	48000	GRATE AREA	SQUARE FEET	13.5
BOILER	TYPE	n Bar n Tog	IT II	-	4	GR	. <u>x</u>	
	T	Crown Bar, Wagon Top.	WEIG	FRAILING WHEELS		Tr.	TOTAL	797
	LEADING NO. DIA.	28″	RAGE			So. 1	IPES	
	LEA.	4	AVE	TENDER	55000	FACE,	ARCH PIPES	
	COUPLED DRIVERS NO. DIA.	20′′				HEATING SURFACE, SQ. FT.	FIRE BOX	79
WHEELS	WPLED I	4		ENGINE AND TENDER	41′-(HEATI		~
WH			WHEEL BASE	ENGINE			FLUES	718
	TRAILING NO. DIA.		HEEL	E .	0″ 1			Coal
		78%	W	RIGID	7′-	FUEL	KIND	snou
	TENDER NO. DIA.	∞		DRIVING	/-0" 7'-0" 7'-0" 41'-0"	1		Bituminous Coal
on.	STROKE	20″		СТВ	,0,	JRE		
CYLINDERS	DIA.	15"	TUES	LENGTH	9.	BOILER PRESSURE	OUNDS PER SQ, INCHABOVE ATMOSPHERE	0
CVLII	TYPE	Simple 15"	FLU	DIA.	154 2"	ER P	POUNDS PER SQ. ABOVE ATMOSPH	150
	TV			NO.	154	BOIL	POU	
		225						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1895 FOR THE CENTRAL RAILWAY OF BRAZIL.

CODE WORD, YAFFLE.

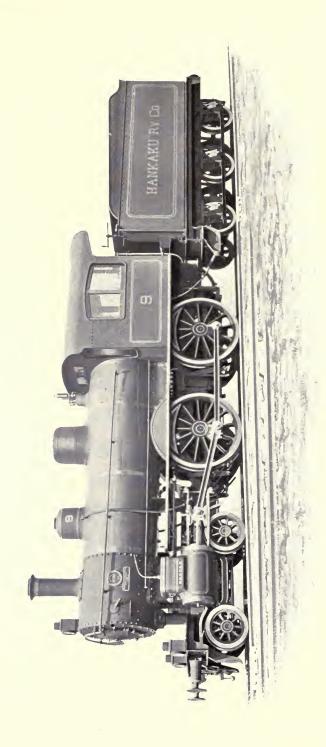
TYPE, 8-WHEELED PASSENGER.

SERIES, 536. CLASS, 14 A.

WITH 8-WHEELED TENDER

TANK CAPACITY 2400 U. S. GALLONS AND 5 TONS FUEL.

		E	1					SO	
		WIDI	$27\frac{1}{2}$	ro.	TOTAL	74000	ACK	INCHES	33%
BOX		LENGIH WIDIH	$84'' 27\frac{1}{2}''$	Pound	TOT	74(OF TR	FEET	3'-3\frac{3}{8}''
FIRE BOX	TVBE		50½" Long, Wide, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	24000	A GAUGE OF TRACK	METRES	1.000
2	AIG	T. C.	501"	WORKI	DRIVERS	20000	GRATE AREA	SQUARE FEET	15.4
BOILER	710	1	oved	NI TI	Q	Ŋ	GRA	òs.	
B	TVDE		4 25½" Improved Belpaire	WEIGH	FRAILING		T.	TOTAL	827
	DING	DIA.	$25\frac{1}{2}$ "	RAGE	Ε,		SQ. I	PES	1
	LEADING	NO.	4	AVEI	TENDER	58000	FACE,	ARCH PIPES	
1	COUPLED DRIVERS	DIA.	46′′				HEATING SURFACE, SQ. FT.	FIRE BOX	100
WHEELS	UPLED	NO.	4		ENGINE AND TENDER	155 $2'' 9'-0\frac{3}{8}'' 7'-0'' 7'-0'' 18'-2'' 42'-0''$	HEAT		
WH				ASE	ENGINE	/-2″	H	FLUES	727
	TRAILING	DIA.		ET B	EN	18			
	TRA	NO.		WHEEL BASE	RIGID	,,0-,,	1		Cardiff Coal
	TENDER	DIA.	27 <u>1</u> ″		rh.	1-	FUEL	KIND	rdiff
		NO.	∞		DRIVING	7′-0′			Ca
70	anogra	SINONE	18″		LENGTH	08%	JRE	Ha	
CYLINDERS	1	. DIG	Simple $14''$ $18''$ 8 $27\frac{1}{2}''$ —)ES		9′-	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	165
XITI	Į.	1	ole	FLUES	DIA.	2	ER P	IDS PEI	16
)	TVPF	4	Sim		NO.	155	BOIL	POUN ABO	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898 FOR THE HANKAKU RAILWAY COMPANY OF JAPAN.

CODE WORD, YAGER.

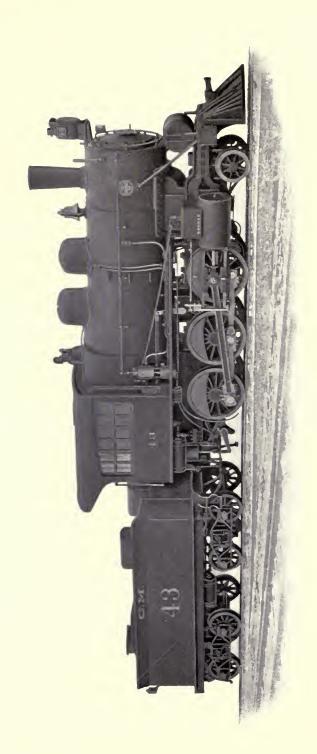
TYPE, 8-WHEELED PASSENGER.

CLASS, 14 A. SERIES, 665.

WITH 6-WHEELED TENDER

TANK CAPACITY 2400 U. S. GALLONS AND 5 TONS FUEL.

BOX	The state of the s	LEAGIN WIDIN	$70'' 29\frac{1}{2}''$	Pounds	TOTAL	00089	GAUGE OF TRACK	FEET INCHES	3'-6"
FIRE BOX	TVDE	7111	48" Long, Wide, 70" 29½"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	21000		METRES	1.067
~	PIA			WORK	DRIVERS	47000	GRATE AREA	SQUARE FEET	14.0
BOILER	TVPF		Rad. Stay, Wagon Top	WEIGHT IN	FRAILING DE	.4		TOTAL SQI	861
	LEADING	NO. DIA.	$4 27\frac{1}{2}$	AVERAGE	TENDER W	45000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
rs	COUPLED DRIVERS	DIA.	,,09		ENGINE AND TENDER		ATING SUR	FIRE BOX	92
WHEELS	-	. NO.	4	SASE	ENGINE		HE	SHITIA	785
	TRAILING	NO. DIA.	-	WHEEL BASE	RIGID	7′-0″ 18			is Coal
	TENDER	NO. DIA.	6 33½"		DRIVING	7'-0" 7'-0" 18'-8" 37'-6"	FUEL	KIND	Bituminous Coal
RS	STROKE		24″		LENGTH	,,0-,6	SURE	INCH	
CYLINDERS	101		Simple 14"	FLUES	DIA, L	192 $1\frac{3}{4}$ 9'-	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	160
C	TYPE		Simpl		NO.	192	BOILE	POUND	
			229						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1899

FOR THE MEXICAN CENTRAL RAILWAY.

CODE WORD, YAKIN.

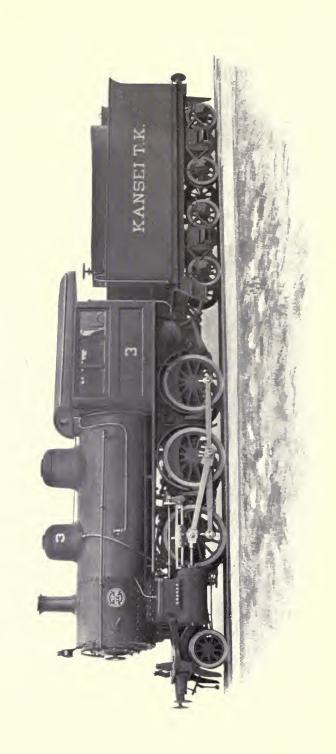
TYPE, MOGUL FREIGHT.

WITH 8-WHEELED TENDER

TANK CAPACITY 4500 U. S. GALLONS AND 81 TONS FUEL.

SERIES, 676. CLASS, 20 B.

 $38\frac{1}{2}''$ INCHES LENGTH WIDTH GAUGE OF TRACK $4'-8\frac{1}{2}''$ 156300 TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FEET 97″ FIRE BOX Long, Wide 1.435 METRES LEADING WHEELS 24300 TYPE GRATE AREA SQUARE FEET 24.6 DIA. DRIVERS 132000 BOILER Improved Belpaire TYPE 2088 TRAILING TOTAL HEATING SURFACE, SQ. FT. $28\frac{1}{2}$ " NO. DIA. LEADING ARCH PIPES TENDER 91300 0 COUPLED DRIVERS FIRE BOX 55" DIA. 165 ENGINE AND $46'-4\frac{1}{4}''$ TENDER WHEELS NO. 9 1923 FLUES 10′-0″ 18′-1″ WHEEL BASE ENGINE TRAILING DIA. Bituminous Coal NO. RIGID FUEL KIND $34\frac{1}{2}$ " TENDER NO. DIA. 10′-0″ ∞ STROKE **2**6′ $11'-7\frac{1}{8}"$ BOILER PRESSURE LENGTH POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS , 20 , DIA. FLUES 180 DIA. 'n Simple TYPE 320



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A. BUILT BY

FOR THE KANSEI RAILWAY OF JAPAN.

CODE WORD, YAKSHA.

TYPE, MOGUL FREIGHT.

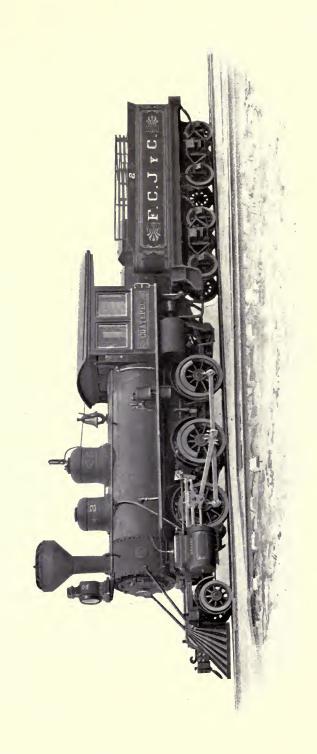
233

SERIES, 612. CLASS, 16 B.

WITH 8-WHEELED TENDER

TANK CAPACITY 2700 U. S. GALLONS AND 5½ TONS FUEL.

BOX		LENGIB WIDTH	84" 29"	Pounds	TOTAL	82880	GAUGE OF TRACK	FEET INCHES	3′-6″
FIRE BOX	TVBE	7117	27½" Rad. Stay, 56" Long, Wide 84" 29"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	70000	A GAUGE	METRES	1.067
BOILER	10		ty, Top 56"	IN WORK	DRIVERS	12880	GRATE AREA	SQUARE FEET	16.4
BO	TVDE		"Rad. Sta	E WEIGHT	TRAILING		FT.	TOTAL	1074
	LEADING	NO. DIA.	2 271	AVERAG	TENDER	28000	ACE, SQ.	ARCH PIPES	
	RIVERS	DIA.	48″				HEATING SURFACE, SQ. FT.	FIRE BOX	95.2
WHEELS	COUPLED DRIVERS	NO.	9	3E	E TENDER	38′-1	HEATI	FLUES	Bituminous Coal 978.8
	TRAILING	DIA.		WHEEL BASE	ENGINE	17′-4		<u>į</u>	oal 9
		A. NO.		WHE	RIGID	10′-4″	FUEL	KIND	ous Co
	TENDER	NO. DIA.	8 27½"		DRIVING	/4-/01	FI	х	Situmin
RS	MA CTBOLLE	TWO WEST	22″		LENGTH	/4	SURE	NCH	I
CYLINDERS			Simple 16" 22"	FLUES	DIA, I.	202 2" 9'-4" 10'-4" 11'-4" 38'-0"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	165
!	TVPF		Sim		NO.	202	BOIL	POUI	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE JALAPA & CORDOVA RAILWAY COMPANY OF MEXICO.

CODE WORD, YAKSTERN.

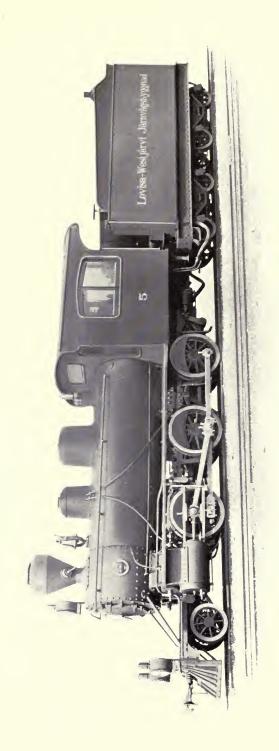
TYPE, MOGUL FREIGHT.

Series, 623. Class, 14 B.

WITH 8-WHEELED TENDER

TANK CAPACITY 1700 U. S. GALLONS AND 11 TONS FUEL.

CYLI	CYLINDERS					W	WHEELS	70			BO	BOILER	FIR	FIRE BOX	
TVDE			TEN	TENDER	TRAI	TRAILING	COUPLE	COUPLED DRIVERS	LEADING	DING	TVPF	DIA	TVPF	ETONET	BACTH MEDER
IYFC	DIA.	DIA. SIKONE	NO.	DIA.	NO.	DIA.	NO.	DIA.	NO.	DIA.					
Simple 14" 20"	14″	20″	8 28″	28″			9	42″	2	26″	Rad. Sta Straight	ay, Top 52"	Rad. Stay, Straight Top 52" Long, Wide	»4 ₈	24"
FLI	FLUES				VHEE	WHEEL BASE	(-3		AVE	RAGE	WEIGHT	IN WOR	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	R, Pound	
NO, DIA.	LENGTH		DRIVING		RIGID	ENGINE		ENGINE AND TENDER	TENDER	TR	TRAILING	DRIVERS	LEADING	TOT	TOTAL
148 2″	, ×	2,	10′-4′	10	/-4/	2" 8'-2" 10'-4" 10'-4" 16'-10" 40'-3"	, 40		50000	1		26000	7800	638	63800
BOILER PRESSURE	PRESSU	JRE		FUEL	. 1		HEA'	HEATING SURFACE, SQ. FT.	RFACE,	So. F		GRATE AREA		GAUGE OF TRACK	ACK
POUNDS PER SQ. INCH ABOVE ATMOSPHERE	OUNDS PER SQ. INCH ABOVE ATMOSPHERE	H 2		KIND		FLI	FLUES	FIRE BOX	ARCH PIPES	IPES	TOTAL	SQUARE FEET	T METRES	FEET	INCHES
1	135			Wood	77	9	635	83			718	13.5	.915		3′-0″



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A. BUILT BY

 $18\,9\,9$ for the LOVISA-WESIJARVI Railway OF FINLAND.

CODE WORD, YAKTAM.

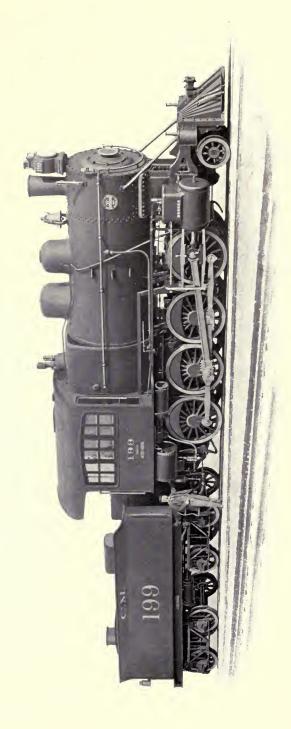
TYPE, MOGUL FREIGHT.

CLASS, 12½ B. SERIES, 691.

WITH 8-WHEELED TENDER

TANK CAPACITY 2500 U. S. GALLONS AND 6 TONS FUEL.

BOX	LENGTH WIDTH	91" 19"	Pounds	TOTAL	50717	GAUGE OF TRACK	FEET INCHES	2'-5½"
FIRE BOX	TYPE	ong, Wide	G ORDER,	LEADING	7717		METRES	0.75
BOILER	TYPE DIA.	2 24½" Rad. Stay, 45" Long, Wide 91"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	43000	GRATE AREA	SQUARE FEET	12.2
		Rad. Straig	GE WEIGE	TRAILING). FT.	TOTAL	585
	LEADI NO.	2 24	AVERA	TENDER	46297	HEATING SURFACE, SQ. FT.	ARCH PIPES	
νί	COUPLED DRIVERS NO. DIA.	37"	SASE	ENGINE AND TENDER			FIRE BOX	78
WHEELS	-	9		SASE	ENGINE ENG	3′-0″ 4(HEA	FLUES
	TRAILING NO. DIA.		WHEEL BASE	RIGID E	0′-0″ 16	T	0	Wood
	TENDER NO. DIA.	8 24½"		DRIVING	10'-0" 10'-0" 16'-0" 40'-0"	FUEL	KIND	Coal or Wood
DERS	DIA. STROKE	12½" 18"	S	LENGTH	8′-2″	ESSURE	SQ. INCH SPHERE	
CYLINDERS	TYPE	Simple Piston 12 Valve	FLUES	NO. DIA.	120 2"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	150



1897

FOR THE MEXICAN CENTRAL RAILWAY,

CODE WORD, YAMMA.

WITH 8-WHEELED TENDER

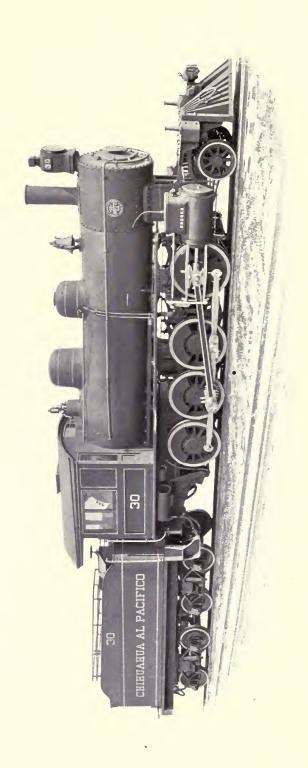
TYPE, CONSOLIDATION FREIGHT.

TANK CAPACITY 4500 U. S. GALLONS AND 8½ TONS FUEL.

OF THE UNIVERSITY

CLASS, 21 C. SERIES, 618.

NIA							1	99	
BOX	A STATE OF THE PARTY OF THE PAR	LENGIH WIDI	74" Long, Wide 120" 373"	Pounds	TOTAL	180000	OF TRACK	HEATING SURFACE, Sq. FT. GRATE AREA C C C C C C C C C	$4'-8\frac{1}{2}''$
FIRE	TVDE	7117	ong, Wide	G ORDER,	LEADING	20000		METRES	1.435
ER	DIA	DIM.		N WORKIN	DRIVERS	160000	ATE AREA	SQUARE FEET	31.45
BOIL	TVDE	7111	Improved Belpaire	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	FRAILING			RE FUEL HEATING SURFACE, Sq. FT. GRATE AREA GAUGE OF TR KIND FLUES FIRE BOX ARCH PIPES TOTAL SQUARE FEET METRES FEET BITUMINOUS Coal 2140 204 — 2344 31.45 1.435 4′-8	
	ING	DIA.	$2 28\frac{1}{2}$	AGE	TR		So. F	PES	
	LEADING	NO.	2	AVER	FENDER	00006	FACE,	ARCH PI	
CYLINDERS WHEELS BOILER FIRE BOX	COUPLED DRIVERS	DIA.	57′′		ENGINE AND TENDER		ING SUR	FIRE BOX	204
HEELS		NO.	∞		ENGINE TEI	50′-	HEAT	ES	40
WHEELS BOILER		DIA.		WHEEL BASE		23′-5″		FLU	
	TRAILING	NO. D		HEEL	£	<u></u> 0,			Coal
	-	DIA.		M	RIGID	15′.	TOEL	KIND	nous
	TENDER	NO.	8 34½"		DRIVING	$\frac{5}{16}$ " 15'-0" 15'-6" 23'-5" 50'-9\frac{1}{4}"			Bitumi
NDERS	adodas	SINONE	26″	İ	СТН		URE	CH	
	1	DIA.	21″	FLUES	LENGTH	11′-1	RESS	R SQ. IN MOSPHER	30
CYLL	70 17		Simple 21"	FLI	DIA.	2,1	LER F	UNDS PE	18
	TYPE		Sin		°° N	374	BOI	POI	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898 FOR THE CHIHUAHUA & PACIFIC RAILROAD OF MEXICO.

CODE WORD, YAMPO.

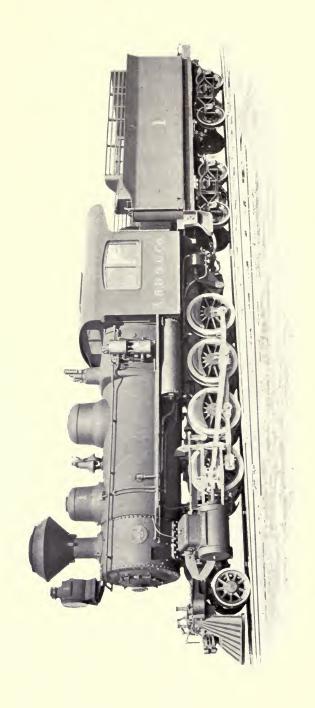
TYPE, CONSOLIDATION FREIGHT.

CLASS, 18 C. SERIES, 660.

WITH 8-WHEELED TENDER

TANK CAPACITY 4000 U. S. GALLONS AND 10 TONS FUEL.

XC		CENGIB WIDIR	108" 33"	OUNDS	TOTAL	130000	F TRACK	FEET INCHES	4'-8½"
FIRE BOX	TVDE		Long	3 ORDER, P	LEADING WHEELS	14000	GAUGE OF TRACK	METRES	1.435
ER	- VIG	DIA. 90 58"		AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	116000	GRATE AREA	SQUARE FEET	24.3
BOILER	TVDE		Rad. Stay, Wagon Top	WEIGHT	TRAILING			TOTAL	1807
	LEADING	NO. DIA.	2 30"	AVERAGE	TENDER	80000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
s	COUPLED DRIVERS	DIA.	20′′	BASE	ENGINE AND TENDER		TING SUR	FIRE BOX	150
WHEELS		A. NO.	∞		ENGINE TH	-10" 14'-6" 14'-6" 22'-0" 47'-0"	HEA	FLUES	1657
	TRAILING	NO. DIA.		WHEEL BASE	RIGID	14'-6" 2	FUEL	KIND	Oak or Mesquite
	TENDER	NO. DIA.	8 33"		DRIVING	14′-6″	FU	KI	Oak or
CYLINDERS	DIA STROVE		18" 26"	JES	LENGTH	13,	BOILER PRESSURE	R SQ. INCH JOSPHERE	180
CYLII	TVPE		% Simple 18″	FLUES	NO, DIA,	232 2"	BOILER P	POUNDS PEŘ SQ. INCH ABOVE ATMOSPHERE	31



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1898

FOR THE AMERICAN RAILROAD & LUMBER COMPANY OF MEXICO.

CODE WORD, YAPOCK.

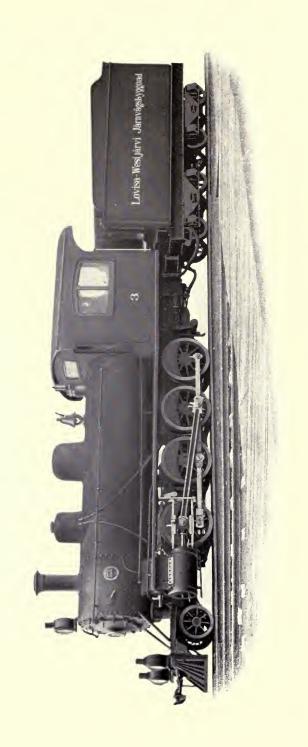
TYPE, CONSOLIDATION FREIGHT.

SERIES, 644. CLASS, 17 C.

WITH 8-WHEELED TENDER

TANK CAPACITY 3000 U. S. GALLONS AND 11 TONS FUEL.

		Н	1				M	IES		
		LENGTH WIDTH	24	DS	OTAL	4200	RACI	INCHES	3′-0″	
BOX		LENGI	108′	Poun	F 🖺	10	OF T	FEET	ý	
FIRE BOX	TEXTE	TILE	60" Long, Wide 108" 24"	G ORDER,	LEADING	10500	GAUGE OF TRACK	METRES	.915	
8	A I C	VIII.	09 1	WORKIN	IVERS	3700	GRATE AREA	SQUARE FEET	17.4	
BOILER	20	1	oved	T IN	DF	රි	GRA	ıðs		
B	TVDE		Improved Belpaire	WEIGH	RAILING WHEELS	İ	fT.	TOTAL	1458	
	LEADING	DIA,	28″	RAGE	E.		SQ.]	PES	1	
	LEAI	NO.	2	AVEF	NDER	0006	FACE,	ARCH PIPES		
	COUPLED DRIVERS	DIA.	44″		ENGINE TENDER TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	127	
WHEELS	UPLED	NO.	∞			44	HEAT		-	
MH		DIA.		WHEEL BASE		20′-0″		FLUES	1331	
	TRAILING	NO.		HEEL	E E	.2				
	3.R	DIA.	30″	W		12,	FUEL	KIND	Wood	
	TENDER	NO.	∞		DRIVING	12'-2"	Ħ		*	
	STROKE		20″		TH.	18/18	RE	T		
CYLINDERS	DIA		17″	ES	LENG	10′-	ESSU	POUNDS PER SQ. INCH ABOVE ATMOSPHERE		
YLIN	(r)		le	FLUES	DIA.	2′	SR PF	DS PER E ATMO	190	
0	TYPE		Simple 17" 20"		NO.	254	BOILER PRESSURE	POUNI		



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE LOVISA-WESIJARVI RAILWAY OF FINLAND. 1899

CODE WORD, YAPON.

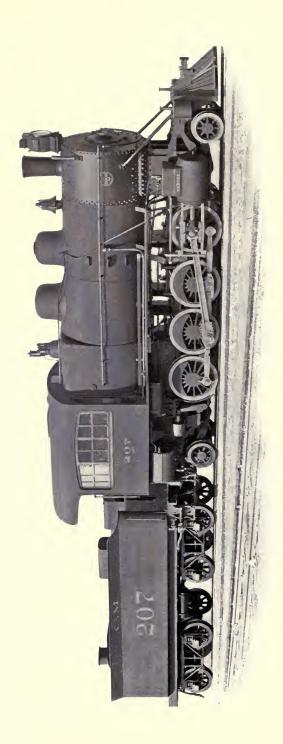
SERIES, 690.

TYPE, CONSOLIDATION FREIGHT.

WITH 8-WHEELED TENDER

CLASS, 14 C. TANK CAPACITY 2500 U. S. GALLONS AND 6 TONS FUEL.

BOX		LENGIR WIDIN	2 24½" Rad. Stay, Straight Top 48" Long, Wide 110" 20"	Pounds	TOTAL	60635	GAUGE OF TRACK	FEET INCHES	2'-51"
FIRE BOX	DIA. TYPE		Long, Wide	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS .	7716		METRES	0.75
ER			op 48"	N WORKI	DRIVERS	52919	GRATE AREA	SQUARE FEET	14.5
BOILER	TYPE		Rad. Stay Straight T	WEIGHT 1	TRAILING			TOTAL	721
	LEADING	DIA.	243"	RAGE	TR		, SQ. F	IPES	1
	LEA	NO.	0	AVE	FENDER	46297	RFACE	ARCH PIPES	
	COUPLED DRIVERS	DIA.	37"		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	100
WHEELS		NO.	∞			ENGIN	39′-	HEAT	FLUES
.11	TRAILING	DIA.		BASE	ENGINE	17′-0″		FLI	621
		NO.		WHEEL BASE	RIGID	11′-0″	EL	Q:	r Coal
	TENDER	NO. DIA,	14" 18" 8 24½" —		DRIVING	147 $2''$ $8'-2\frac{1}{16}''$ 11'-0" $11'-0''$ 17'-0" $39'-1\frac{5}{8}''$	FUEL	KIND	Wood or Coal
S	Page	STROKE	18″		LENGTH	$2\frac{1}{16}$ "	URE	CH	
CYLINDERS	101.4		14″	FLUES		, w , w	PRESS	ER SQ. IN MOSPHER	150
CYL	TVPE		Simple Piston Valve	FL	NO. DIA.	147 2"	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	1.



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897 FOR THE MEXICAN CENTRAL RAILWAY.

CODE WORD, YAPWAH.

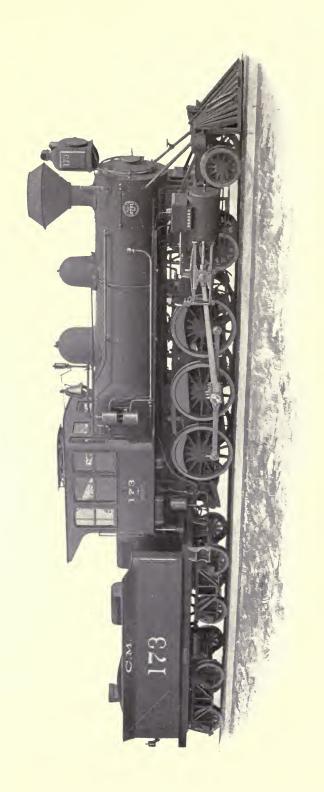
Series, 605. Class, 21 C. P.

TYPE, CONSOLIDATION FREIGHT, DOUBLE ENDER.

WITH 8-WHEELED TENDER

TANK CAPACITY 4500 U. S. GALLONS AND 8½ TONS FUEL.

CYLIN	CYLINDERS						WHEELS	α			BO	BOILER		FIRE BOX	BOX	
			TENDER	DER	TRAI	TRAILING	COUPLI	COUPLED DRIVERS		LEADING	TVPE	DIA		TVPE	LENGTH WIDTH	WIDTH
LYPE	DIA. S	STROKE	NO.	DIA.	NO.	DIA.	NO.	DIA.	NO.	DIA.						
e	Simple 21" 26"	26″	∞	$8 35\frac{1}{2}$ $2 28\frac{1}{2}$	2	$28\frac{1}{2}$ "	∞	49″	2	$28\frac{1}{2}$ "	2 28½" Improved Belpaire		, Loi	78" Long, Wide $120'' 37^{3.''}_{4}$	120″	373"
FLU	FLUES			=	THEE	WHEEL BASE	SE		AVE	RAGE	WEIGHT	NI WO	RKING	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	Pounds	-
DIA.	LENGTH	Н	DRIVING		RIGID	ENGINE		ENGINE AND TENDER	TENDER	TR	FRAILING	DRIVERS		LEADING WHEELS	TOTAL	TOTAL
2″	12′-1	1 6	13′-0	, 13	,,0-,	28′-	412 2" 12'-15" 13'-0" 13'-0" 52'-2" 52'-2"	2'-2"	00006	7	24800	145200		23450	193	193450
CR P	BOILER PRESSURE	IRE		FUEL			HE/	HEATING SURFACE, SQ. FT.	JRFACE,	, SQ. F	Ţ.	GRATE AREA	AREA	GAUGE OF TRACK	OF TR	ACK
DS PE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	H B		KIND		790	FLUES	FIRE BOX	ARCH PIPES	PIPES	TOTAL	SQUARE FEET	TEET	METRES	FEET	INCHES
15	180		Bitun	Bituminous Coal	s Co		2585	218			2803	31.45	w	1.435	4'-81"	81"



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., G.S.A.

897

FOR THE MEXICAN CENTRAL RAILWAY.

CODE WORD, YARRAN.

TYPE, 10-WHEELED PASSENGER.

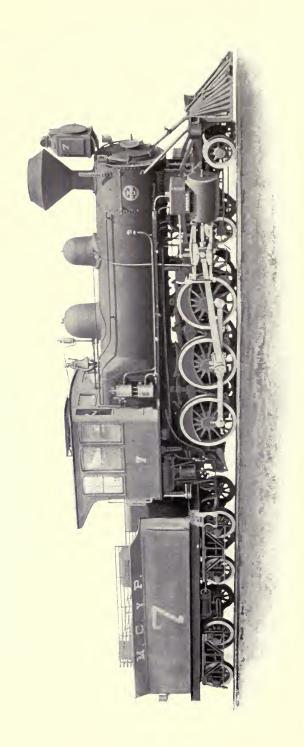
FOR THI

WITH 8-WHEELED TENDER

Series, 602.

CLASS, 20 D. TANK CAPACITY 4500 U. S. GALLONS AND 8½ TONS FUEL.

		LENGTH WIDTH	32″	SC	TOTAL	147500	RACK	INCHES	4'-81"
FIRE BOX		LENGIH	$120\frac{13}{16}$ 32"	, Pouni	TEN	14,	OF T	FBET	
FIRE	TVDE	7117	Long	G ORDER	LEADING	36500	GAUGE OF TRACK	METRES	1.435
. R	A I C	DIA	$62\frac{1}{2}''$	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	111000	GRATE AREA	SQUARE FEET	26.1
BOILER	TVDE	7111	Improved Belpaire	VEIGHT IN	TRAILING			TOTAL	2031.5
	NG	DIA.	$34\frac{1}{2}$ "	AGE V	TRAI		Sq. Ft.		28
	LEADING	NO.	4	AVER	TENDER	85000	FACE,	ARCH PIPES	
	RIVERS	DIA.	,,09				HEATING SURFACE, SQ. FT.	FIRE BOX	187.7
WHEELS	COUPLED DRIVERS	NO.	9		ENGINE AND TENDER	-2 ½" 11'-0" 11'-0" 23'-4" 51'-4"	HEATI		3.8
WI		DIA.	-	WHEEL BASE	ENGINE	23′-4″		FLUES	Biruminous Coal 1843.8
	TRAILING	NO.		VHEEL	RIGID	__ 0-,	. 1		s Coa
	TENDER	DIA.	8 34½")″ 11	FUEL	KIND	ninou
		NO.			DRIVING	11′-(Bitur
RS	STEGETS		24″		LENGTH	$-2\frac{9}{16}$ "	SURE	NCH	
CYLINDERS			20″	FLUES		13	PRES	ER SQ. 1	180
CVL	TVPE		Simple 20"	FI	NO. DIA.	268 2" 13'	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	, ,
			249		.,	(1	Щ		



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

18.9.8 FOR THE MEXICO CUERNAVACA & PACIFIC RAILWAY.

WITH 8-WHEELED TENDER

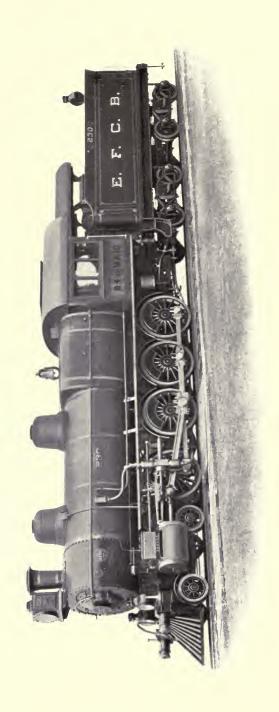
TYPE, 10-WHEELED FREIGHT.

CODE WORD, YARROW.

CLASS, 20 D. SERIES, 643.

TANK CAPACITY 4500 U. S. GALLONS AND 81 TON FUEL.

		WIDIN	32"		T E	00	CK	INCHES	
FIRE BOX		LENGIH	120 1 32"	Pounds	TOTAL	143700	GAUGE OF TRACK	FEET	$4'-8\frac{1}{2}''$
FIRE	TVDE	IILE	Long	G ORDER,	LEADING	34850		METRES	1.435
N.	AIG	DIA.	$62\frac{1}{2}''$	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	108850	GRATE AREA	SQUARE FEET	26.1
BOILER	TVDE	7717	4 28½" Belpaire	EIGHT IN		1	GRZ	TOTAL	2031.5
	S.G.	DIA.	837	GE W	TRAILING	Metable	Q. FT.		203
	LEADING	NO.	4	AVERA	FENDER	85000	HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS	DIA.	26″				NG SUR	FIRE BOX	187.7
WHEELS	COUPLED	NO.	9		ENGINE AND TENDER	51′-	HEATI	FLUES	1843.8
W	TRAILING	DIA.	ſ	WHEEL BASE	ENGINE	23′-4″		FL	
	TRAI	NO.		WHEE	RIGID	11′-0″	3L	Q	Wood or Coal
	TENDER	NO. DIA.	341		DRIVING	<u></u> _0-	FUEL	KIND	o poo
			×		DRI	11,			\geqslant
DERS	DIA STROKE	- 1	Simple 20" 24" 8 34½"	SS	LENGTH	2" 13'-21 ⁹ " 11'-0" 11'-0" 23'-4" 51'-4"	BOILER PRESSURE	FOUNDS PER SQ. INCH ABOVE ATMOSPHERE	
CYLINDERS			le	FLUES	DIA.	2	SR PR	POUNDS PER SQ. INCHABOVE ATMOSPHERE	180
O	TVPE		Simp		NO.	268	BOILE	POUNI	



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1894 FOR THE CENTRAL RAILWAY

OF BRAZIL.

SERIES, 530. CLASS, 21 F.

TANK CAPACITY 4000 U. S. GALLONS AND 81 TONS FUEL.

WITH 8-WHEELED TENDER

TYPE, 12-WHEELED FREIGHT.

CODE WORD, YELDREN.

-	WIDTH	$38\frac{1}{2}$ "		AL	000	ACK	INCHES	3′′
BOX	LENGTH WIDTH	$114'' 38\frac{1}{2}''$	Pounds	· TOTAL ENGINE	170000	OF TR.	FEET	5'-3"
FIRE BOX	TYPE	Long	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	28000	A GAUGE OF TRACK	METRES	1.60
~	DIA.		WORKI	DRIVERS	142000	GRATE AREA	SQUARE FEET	29.3
BOILER	TYPE	Improved Belpaire	WEIGHT IN	TRAILING DI WHEELS	14		TOTAL SQ	2200
	LEADING to. DIA.	28′	ERAGE .			HEATING SURFACE, Sq. Ft.	ARCH PIPES	
		4	AV	TENDER	82000	URFAC		
s	COUPLED DRIVERS NO. DIA.	54″		ENGINE AND TENDER	'-6 ³ ″	TING S	FIRE BOX	209
WHEELS	COUPLE NO.	∞	SE		3" 52	HEA	FLUES	1991
	TRAILING NO. DIA.		WHEEL BASE	ENGINE	25′-			oal
			WHE	RIGID	15′-6″	EL	KIND	ous C
	TENDER NO. DIA.	8 30″		DRIVING	248 2‡" 13'-10½" 15'-6" 15'-6" 25'-3" 52'-6¾"	FUEL	Ä	Bituminous Coal
SO.	STROKE	26″		LENGTH	$10\frac{1}{2}^{\prime\prime}$ 1	JRE	HO SI	
CYLINDERS	DIA.	21″	FLUES		13′-	PRESSI	er sq. inc mospher	180
CYLI	TYPE	Simple 21"	FL	NO. DIA.	48 21,	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	Ţ
		253			71	- B		



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE CANADIAN COPPER COMPANY,

CODE WORD, YEOMAN.

TYPE, 6-WHEELED SWITCHER.

CLASS, 17 H. SERIES, 566.

WITH 8-WHEELED TENDER, SLOPING BACK TANK, CAPACITY 2500 U. S. GALLONS AND 4 TONS FUEL.

LENGTH WIDTH 34″ FEET INCHES GAUGE OF TRACK $4'-8\frac{1}{2}''$ TOTAL 80000 AVERAGE WEIGHT IN WORKING ORDER, POUNDS 84″ FIRE BOX 1.435 METRES LEADING WHEELS Long TYPE GRATE AREA SQUARE FEET Crown Bar, Wagon Top 501" DIA. 18.6 80000 DRIVERS BOILER TYPE TRAILING TOTAL 864 HEATING SURFACE, SQ. FT. DIA. LEADING ARCH PIPES NO. 62000 TENDER COUPLED DRIVERS FIRE BOX 50''DIA. 94 ENGINE AND TENDER 36′-0″ WHEELS NO. 9 FLUES 770 10′-0″ 10′-0″ 10′-0″ WHEEL BASE ENGINE TRAILING DIA. Bituminous Coal NO. RIGID FUEL KIND 30″ DIA, TENDER DRIVING NO. ∞ STROKE 24″ BOILER PRESSURE 9'-7" LENGTH POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS DIA. Simple 17" FLUES 150 DIA. 'n TYPE 156



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

FOR THE TRANSVAAL & DELAGOA BAY COLLIERIES OF SOUTH AFRICA.

CODE WORD, YESTEL.

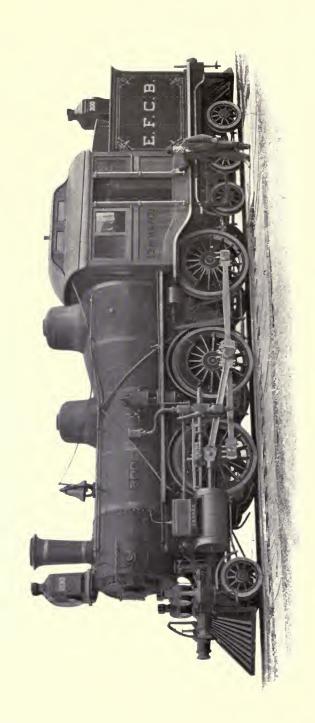
TYPE, 4-WHEELED SADDLE TANK ENGINE.

TANK CAPACITY 600 U. S. GALLONS AND 1 TON FUEL.

CLASS, 13 E. T. SERIES, 593.

BOX		LENGTH WIDTH	42" 28"	Pounds	TOTAL	42000	GAUGE OF TRACK	FEET INCHES	3'-6"
FIRE BOX	and and	INFE	Deep	NG ORDER,	LEADING WHEELS			METRES	1.067
BOILER		INFE DIA.	Rad. Stay, Straight Top 40"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	42000	GRATE AREA	SQUARE FEET	7.8
-			Rad. Straig	E WEIGH	TRAILING		FT.	TOTAL	497
	LEADING	NO. DIA.		AVERAG	TENDER		FACE, SQ.	ARCH PIPES	
S	COUPLED DRIVERS	DIA.	. 42″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	49′′
WHEELS		A. NO.	4	BASE	ENGINE ENG	2,-8,	HEA	FLUES	448
	R TRAILING	A. NO. DIA.		WHEEL BASE	RIGID	5'-8" 5'-8"	FUEL	KIND	Bituminous Coal
	TENDER	NO. DIA.			DRIVING		FI	X	Bitumin
DERS		DIA, SIROKE	13" 18"	ES	LENGTH	0-/6	ESSURE	SQ. INCH	
CYLINDER	TVBE		Simple 13"	FLUES	NO. DIA.	,,2	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	150

257



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1894

FOR THE CENTRAL RAILWAY

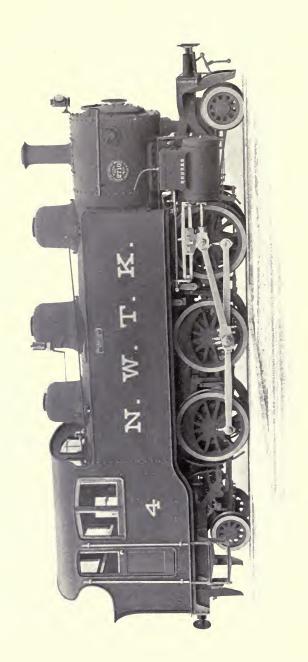
OF BRAZIL.

CODE WORD, YOCKEL.

REAR TANK, CAPACITY 2400 U. S. GALLONS AND 3½ TONS FUEL. TYPE, 6-COUPLED DOUBLE ENDER TANK ENGINE.

CLASS, 18 B. R. X. SERIES, 533.

FIRE BOX	LENGTH WIDTH	$96'' 38\frac{1}{2}''$	Pounds	TOTAL	176000	OF TRACK	FEET INCHES	5'-3"
FIRE	TYPE	Sloping	G ORDER,	LEADING	16000	GAUGE	METRES	1.60
BOILER	TYPE DIA.	29½ Crown Bar, 58"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	110000	GRATE AREA GAUGE OF TRACK	SQUARE FEET	24.6
B		Crowi Wagoi	GE WEIGH	TRAILING W HEELS	20000	Q. FT.	S TOTAL	1612
	LEAI	2	AVERA	TENDER		URFACE, S	ARCH PIPES	1
WHEELS	COUPLED DRIVERS NO. DIA.			ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	156
WHI	ILING DIA.	$6 29\frac{1}{2}$	WHEEL BASE	ENGINE	34′-0″	I	FLUES	oal 1456
	DER DIA.	9	WHEI	S RIGID	252 2" 11'-13" 14'-0" 14'-0" 34'-0"	FUEL	KIND	Bituminous Coal
	- ×	24″		TH DRIVING	3" 14'-0	RE		Bitun
CYLINDERS	DIA, STROKE	Simple 18" 24"	FLUES	DIA, LENGTH	2" 11'-1	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	180
C	TYPE	Simpl		NO.	252	BOILE	POUNDS	



BROOKS LOCOMOTIVE WORKS

9681

DUNKIRK, N. Y., U.S.A.

FOR THE NANWA RAILWAY

CODE WORD, YODLER.

OF JAPAN.

SIDE TANKS, CAPACITY 1200 U. S. GALLONS AND 11 TONS FUEL. TYPE, 6-COUPLED DOUBLE ENDER TANK ENGINE.

CLASS, 15 B. P. Y.

SERIES, 588.

LENGTH WIDTH 28′ FEET INCHES GAUGE OF TRACK 94000 TOTAL 3'-6" AVERAGE WEIGHT IN WORKING ORDER, POUNDS 78′ FIRE BOX Long, Wide, Sloping 1.067 METRES 11000 LEADING WHEELS TYPE GRATE AREA Rad. Stay, Straight Top 54" SQUARE FEET DIA. 15.2 74000 DRIVERS BOILER TYPE 981.8 FRAILING WHEELS TOTAL 0006 HEATING SURFACE, SQ. FT. ,,92 DIA. TRAILING COUPLED DRIVERS LEADING ARCH PIPES TENDER 0 FIRE BOX 87.2 DIA. ENGINE AND TENDER WHEELS Bituminous Coal 894.6 FLUES WHEEL BASE 210 13" 9'-4" 10'-4" 10'-4" 23'-8" ENGINE 26′′ NO. DIA. RIGID N FUEL TENDER DIA. DIA. LENGTH DRIVING NO. STROKE Simple 15" 22" BOILER PRESSURE POUNDS PER SQ, INCH ABOVE ATMOSPHERE CYLINDERS DIA, FLUES 150 TYPE NO.

261



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

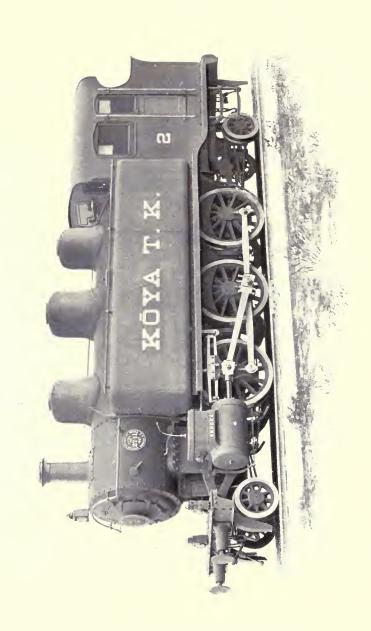
FOR THE HANKAKU RAHWAY OF JAPAN.

CLASS, 15 B. P. Y. SERIES, 666.

CODE WORD, YODMAT.

SIDE TANKS, CAPACITY 1320 U. S. GALLONS AND 2 TONS FUEL. TYPE, 6-COUPLED DOUBLE ENDER TANK ENGINE.

THE		$29\frac{1}{2}$ "	S	TAL	000	ACK	INCHES	3'-6"
D#CAST	LESSOI II	78″	Pound	FOU	95(OF TR	FEET	3,
TVPF	7	Long, Wide, Sloping	ING ORDER,	LEADING WHEELS	10000	EA GAUGE	METRES	1.067
DIA	DIA.	54″	WORK	VERS	000	re ar	ARE FEET	15.6
TVDE	7111	Rad. Stay, Straight Top	WEIGHT IN					974
NG	DIA.	271."	AGE 1	TRA	11	Sq. FT		-
LEADI	NO.	0	AVER	NDER		FACE,	ARCH PIP	
DRIVERS	DIA.	52"				ING SURI	FIRE BOX	84.0
COUPLE	NO.	9	· 되			HEAT	LUES	890
ING	DIA.	273"	BAS	ENGINE	23′-8		F	
TRAII	NO.	7	WHEEL	RIGID	0′-4″	L		us Cog
TENDER	NO. DIA.	1		DRIVING	10′-4″ 1	FUE	KINE	Bituminous Coal
	STROKE	22″		NGTH	$4rac{1}{16}^{\prime\prime}$	URE	RE	
	DIA.	15″	UES		9'-	PRESS	ER SQ. IN	160
9	1 FE	nple	FL) 1 ¹²	ILER	OUNDS PI ABOVE AT	1
-	-	263		NO.	21(BO		
	TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA TYPE	THAILING COUPLED DRIVERS DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA, NO, DIA,	TYPE DIA. 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STROKE TENDER TRAILING COUPLED DRIVERS LEADING TYPE DIA. Simple 15" 22" - 2 27½" 6 52" 2 27½" Straight Top 54" FLUES WHEEL BASE NHEEL BASE AVERAGE WEIGHT IN WORK	TYPE DIA. STROKE NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. RAGINE AND STRUCKS NO. DIA. LENGTH DRIVING RIGID ENGINE AND TENDER TENDER WHEELS DRIVERS TENDER TENDER TENDER DRIVING DRIVING DRIVERS	Simple 15" 22" - 2 27½" 6 52" 2 27½" Straight Top 54"	Simple 15" STROKE No. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. 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BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A. BUILT BY

 $\begin{array}{c} 1.8.9.7 \\ \text{For the KOVA RAILWAV Company} \end{array}$

CODE WORD, YODSTAR.

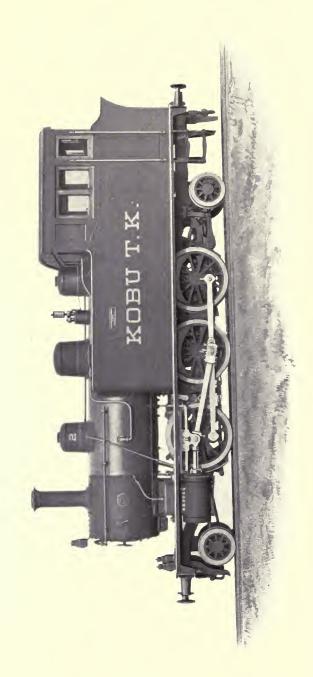
OF JAPAN.

TYPE, 6-COUPLED DOUBLE ENDER TANK ENGINE.

SIDE TANKS, CAPACITY 1560 U. S. GALLONS AND 11 TONS FUEL.

CLASS, 15 B. P. Y. SERIES, 600.

BOX	LENGTH WIDTH	75" 291"	Pounds	TOTAL	92000	GAUGE OF TRACK	FEET INCHES	3′-6″
FIRE BOX	TYPE	ong, Wide,	NG ORDER,	LEADING	11000		METRES	1.067
BOILER	DIA.	Rad. Stay, Straight Top 51" Long, Wide, 75" 29½"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	20000	GRATE AREA	SQUARE FEET	14.8
BO	TYPE	26" Rad. Sta Straight	E WEIGHT	TRAILING	11000		TOTAL	940
	LEADING NO. DIA.	2 26	AVERAG	TENDER		RFACE, SQ.	ARCH PIPES	
ELS	COUPLED DRIVERS NO. DIA.	20″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	. 78
WHEELS		9 ,,92	BASE	ENGINE	24′-4″	H	FLUES	1 862
	NDER TRAII DIA. NO.	_ 2 26"	WHEEL BASE	ING RIGID	-4" 10'-4"	FUEL	KIND	Bituminous Coal
70	STROKE NO.	22″ —		GTH DRIVING	3 ¹ / ₁₆ " 10'-	JRE	В	Bitu
CYLINDERS	TYPE DIA.	Simple 15"	FLUES	NO. DIA. LENGTH	216 $1\frac{5}{8}$ 9'-6 $\frac{1}{16}$ 10'-4" 10'-4" 24'-4"	BOILER PRESSURE	POUNDS PER SQ. INCA ABOVE ATMOSPHERE	150
		265						



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

FOR THE KOBU RAILWAY OF JAPAN.

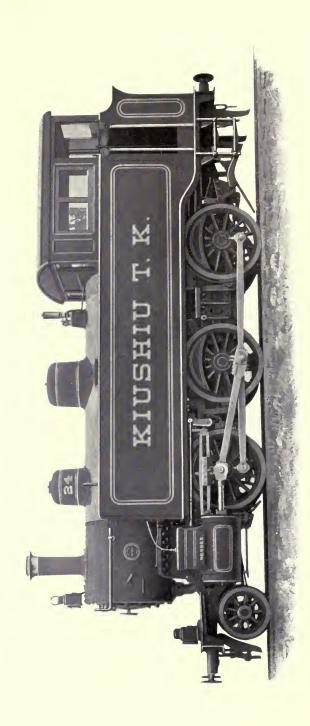
CLASS, 14 B. P. Y. SERIES, 622.

TYPE, 6-COUPLED DOUBLE ENDER TANK ENGINE. CODE WORD, YOGAN.

SIDE TANKS, CAPACITY 1440 U. S. GALLONS AND 11 TONS FUEL.

LENGTH WIDTH Long, Wide, 70" 29" METRES FEET INCHES GRATE AREA GAUGE OF TRACK 87000 ENGINE TOTAL AVERAGE WEIGHT IN WORKING ORDER, POUNDS FIRE BOX WHEELS 0006 TYPE SQUARE FERT Rad. Stay, Straight Top 48" DIA. 13.6 65000 DRIVERS BOILER TYPE TRAILING 13000 TOTAL 292 HEATING SURFACE, SQ. FT. .26′′ DIA. FIRE BOX ARCH PIPES LEADING NO. TENDER TENDER | TRAILING | COUPLED DRIVERS ,₈ 74 ENGINE AND TENDER WHEELS ů. 9 FLUES 693 WHEEL BASE 170 $1\frac{3}{4}$ 9'-1 $\frac{1}{16}$ " 9'-8" 9'-8" 22'-0" ENGINE 26′ NO. DIA. Bituminous Coal RIGID FUEL KIND NO. DIA. LENGTH DRIVING DIA, STROKE -20″ BOILER PRESSURE POUNDS PER SQ. INCH ABOVE ATMOSPHERE CYLINDERS Simple 14" FLUES 165 TYPE S. 267

1.067



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. V., U.S.A.

1898

FOR THE KIUSHIU RAILWAY OF TABAN

FOR THI

Series, 630. Class, 17 B. Y.

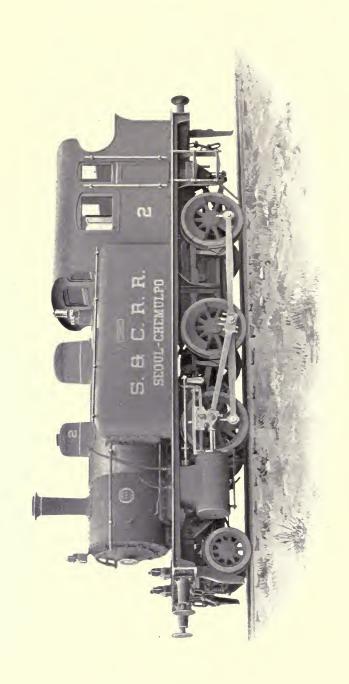
CODE WORD, YONDER.

TYPE, 6-COUPLED TANK ENGINE.

OF JAPAN.

SIDE TANKS, CAPACITY 1320 U. S. GALLONS AND 1½ TONS FUEL.

	WIDTH		29\frac{1}{2}''		AL INE	00	ACK	INCHES	<u>/</u> 9
BOX	LENGTH WIDTH		$72'' 29\frac{1}{2}''$	Pounds	TOTAL	89600	OF TR.	FEET	3′-6″
FIRE BOX	TYPE		Long, Wide, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	15600	SA GAUGE OF TRACK	METRES	1.067
BOILER	TYPE DIA.		Rad. Stay, Straight Top 50"	IT IN WORK	DRIVERS	74000	GRATE AREA	SQUARE FEET	14.1
1	TY		Rad. Straig	WEIGI	FRAILING		FT.	TOTAL	905.1
	LEADING	NO, DIA.	2 30"	AVERAGE	TENDER		HEATING SURFACE, SQ. FT.	ARCH PIPES	
ELS	COUPLED DRIVERS	NO. DIA.	20,,		ENGINE AND TENDER		EATING SU	FIRE BOX	78.1
WHEELS		DIA. NG	9	BASE	ENGINE	.,0-,61	H	FLUES	827
	TRAILING	NO.		WHEEL BASE	RIGID	12′-0″	£I.	9.	us Coal
	TENDER	NO. DIA.			DRIVING	-7" 12'-0" 12'-0" 19'-0"	FUEI	KIND	Bituminous Coal
ERS	A. STROKE		" 22"		LENGTH		SSURE	, INCH HERE	
CYLINDERS	PE DIA.		Simple 17"	FLUES	DIA.	14, 9'	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	160
	TYPE		Sim 269		NO.	190	BOIL	POU	



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE SEOUL-CHEMULPO RAILWAY OF KOREA.

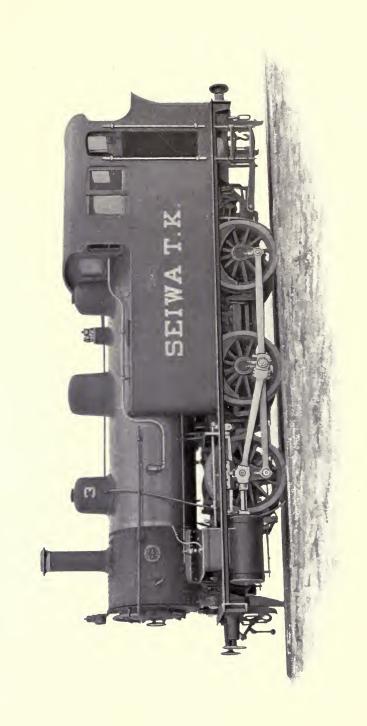
CODE WORD, YONGE.

TYPE, 6-COUPLED TANK ENGINE.

CLASS, 14 B. Y. SERIES, 629.

SIDE TANKS, CAPACITY 960 U. S. GALLONS AND I TON FUEL.

XO		LENGTH WIDTH	54" 35"	OUNDS	TOTAL ENGINE	75000	F TRACK	FEET INCHES	4'-8\frac{1}{2}"
FIRE BOX		INFE	Deep	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING WHEELS	10000	. GAUGE OF TRACK	METRES	1.435
SR	214	DIA	p 46"	N WORKIN	DRIVERS	02000	GRATE AREA	SQUARE FEET	12.66
BOILER	TVDE	1115	Rad. Stay, Straight Top	WEIGHT IN	TRAILING WHEELS			TOTAL 80	646.2
	LEADING	NO. DIA.	2 28"	VERAGE			HEATING SURFACE, Sq. FT.	ARCH PIPES	
	ORIVERS	DIA.	42″		AND TENDER		NG SURFA	FIRE BOX AB	71.2
WHEELS	COUPLED DRIVERS	NO.	9	SE	INE ENGINE AND TENDER	.,0-	HEATU	FLUES	575
	TRAILING	NO. DIA.	-	WHEEL BASE	RIGID ENGINE	12'-3" 12'-3" 19'-0"			Bituminous Coal
	TENDER	NO. DIA.			DRIVING	12'-3" 12	FUEL	KIND	Situminou
ERS	DIA. STROKE		4" 22"	δi 	LENGTH	9'-1"	ESSURE	Q. INCH PPHERE	<u>ш</u>
CYLINDERS	TYPE		Simple 14"	FLUES	NO. DIA.	122 2"	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	140
			271						



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

1897 FOR THE SEIWA RAILWAY OF JAPAN.

SERIES, 625.

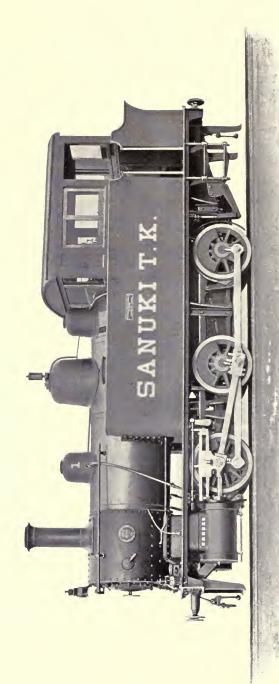
CLASS, 15 H. Y.

TYPE, 6-WHEELED TANK ENGINE. CODE WORD, YONKER.

SIDE TANKS, CAPACITY 1120 U. S. GALLONS AND 11/2 TONS FUEL.

	LENGTH WIDTH	291	S	TOTAL ENGINE	85000	ACK	INCHES	,,9
BOX	LENGTH	72″	Pound	TO. ENC	85(OF TR	FRET	3′-6″
FIRE BOX	TYPE	Rad. Stay, Straight Top So" Long, Wide, 72" 291."	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING		A GAUGE OF TRACK	METRES	1.067
	DIA.	50″	WORK	DRIVERS	000	GRATE AREA	SQUARE FEET	14.1
BOILER	TYPE	Rad. Stay, Straight Top	WEIGHT IN	TRAILING DRIM	85000		TOTAL SQUA	841 1
	DING DIA.		AGE 1	TRA		50. FT		
	LEAI NO.		AVER	TENDER		HEATING SURFACE, SQ. FT.	ARCH PIPES	
	COUPLED DRIVERS NO. DIA.	48″		ENGINE AND TENDER	1	ING SUI	FIRE BOX	77
WHEELS	COUPLEI NO.	9	SE		9,,	HEAT	FLUES	764
	TRAILING NO. DIA.	1	WHEEL BASE	ENGINE	11,4		_	
	TRAILING NO. DIA.		VHEE	RIGID	,6 - ,			s Co
	TENDER NO. DIA.	-		DRIVING	176 13" 9'-7" 11'-9" 11'-9" 11'-9"	FUEL	NIN.	Bituminous Coal
0	DIA, STROKE	22″		GTH	1,1	JRE	H	
CYLINDERS	DIA.	15″	FLUES	LENGTH	, 6,	PRESSU	OUNDS PER SQ. INCL ABOVE ATMOSPHERE	140
CYL	TYPE	Simple 15" 22"	FL	NO. DIA.	176 1 ³ / ₁	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	

273



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. Y., U.S.A.

CODE WORD, YOWL.

TYPE, 6-WHEELED TANK ENGINE.

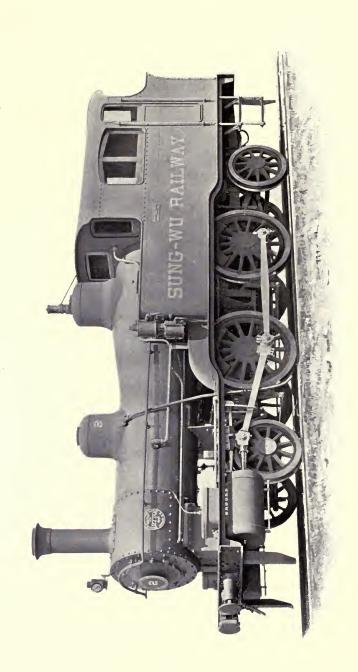
275

FOR THE SANUKI RAILWAY OF JAPAN.

CLASS, 14 H. Y. SERIES, 631.

FUEL.	
TON	
-	
AND	
S. GALLONS	
· s	
972	
CAPACITY	
SIDE IANKS,	
SIDE	

FIRE BOX	TYPE LENGTH WIDTH		Long, $60\frac{1}{8}$ " $23\frac{1}{8}$ "	NG ORDER, Pounds	LEADING TOTAL WHEELS : ENGINE	00009	A GAUGE OF TRACK	METIKES FEET INCHES	1.067 3′-6″
BOILER		TYPE DIA.	Rad. Stay, Straight Top 45"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	TRALLING DRIVERS WHEELS	00009	GRATE AREA	FOTAL SQUARE FEET	534 9.5
	IVERS LEADING	DIA. NO. DIA.	36"	AVERAGE 1	TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX ARCH PIPES 7	89
WHEELS	TRAILING COUPLED DRIVERS	DIA, NO.	9	WHEEL BASE	ENGINE ENGINE AND TENDER	11′-0″	HEATIN	FLUES FINE	466
	TENDER	NO. DIA. NO.		WHE	DRIVING	11′-0″ 11′-0″ 11′-0″	FUEL	KIND	Bituminous Coal
CYLINDERS	TYPE DIA STROKE		Simple 14" 18"	FLUES	NO, DIA, LENGTH	$124 1\frac{3}{4}'' 8'-4''$	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	150



BROOKS LOCOMOTIVE WORKS

DUNKIRK, N. V., U.S.A.

1897

FOR THE SUNG-WU RAILWAY OF CHINA.

CODE WORD, YUCCAN.

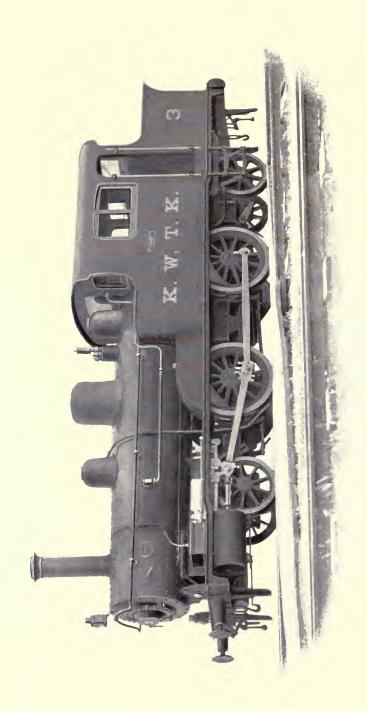
TYPE, 4-COUPLED DOUBLE ENDER TANK ENGINE.

SIDE TANKS, CAPACITY 1360 U. S. GALLONS AND 13 TONS FUEL.

SERIES, 611. CLASS, 17 J. P. Y.

CYLINDERS					WHEELS				BOILER	FIR	FIRE BOX
TVDE		TENDER	TRAILING	ING	COUPLED	COUPLED DRIVERS	LEADING	. SNI			
DIA	NO.	NO. DIA.	NO.	DIA.	NO.	DIA,	NO.	DIA.	DIA.	LIFE	LENGTH WIDTH
Simple 16.536" 23.62" —	.62″ —		_ 2 42"	42″	4	62.59″	6	42" Crc Wa,	4 62.59" 2 42" Crown Bar, 48"	Long, Sloping	78" 34"
FLUES		WHI	WHEEL BASE	ASE		V	VERAG	E WEIGH	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	G ORDER,	Pounds
DIA, LENGTH	DRIVING	RIGID		ENGINE	ENGINE AND TENDER	CD TENDER	ER	TRAILING WHEELS	DRIVERS	LEADING	TOTAL. ENGINE
165 2" 11'-1‡" 7'-6" 7'-6" 20'-0"	/,9-/_	,/9-,/	, 20	,,0-,			1	24800	29000	29000	112800
BOILER PRESSURE		FUEL		Д	HEATTING	HEATING SURFACE, SQ. Fr.	CE, So.	FT.	GRATE AREA		GAUGE OF TRACK
POUNDS PER SQ. INCH ABOVE ATMOSPHERE		KIND		FLUES		FIRE BON ARC	ARCH FIPES	TOTAL	SQUARE FEET	METRES	FEET INCHES
162	Bitumi	Bituminous Coal 957	Coal	957		93.82		1050.82	17.9	1.435	1.435 $4'-8\frac{1}{2}''$

277



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., C.S.A.

FOR THE KIWA RAILWAY 1897

OF JAPAN.

SERIES, 615.

CLASS, 14 J. P. Y.

SIDE AND REAR TANKS, CAPACITY 1200 U. S. GALLONS AND 2 TONS FUEL.

TYPE, 4-COUPLED DOUBLE ENDER TANK ENGINE.

CODE WORD, YULAN.

LENGTH WIDTH	67" 27"	Pounds	TOTAL	77650	OF TRACK	FEET INCHES	3′-6″
TYPE	Long Sloping	ING ORDER,	LEADING WHEELS	18500	A GAUGE	METRES	1.067
YPE DIA.	Stay, 42"	HT IN WORK	DRIVERS	43800	GRATE ARE	SQUARE FEET	12.5
	37" Rad. Strai	AGE WEIG	TRAILING	15350	Sq. Ft.	PES TOTAL	722
	7	AVER	TENDER		URFACE,		-
JPLED DRIVE NO. DIA.			ENGINE ENGINE AND TENDER		IEATING S		64
ILING DIA.	37"	EL BASE		19′-6″	-	KIND FLUE	oal 658
	- 2	WHEE	RIGID	/,-6/	FUEL		Bituminous Coal
TEN	0″				되		Bitum
TYPE DIA, STR	Simple 14" 20	FLUES	NO, DIA, LENGTH	150 13" 9'-7"	BOILER PRESSUR	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	140
	DIA. STROKE NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. TYPE DIA. TYPE TYPE TYPE TYPE	20" — 2 37" 4 52" 2 37" STRAILING COUPLED DRIVERS LEADING TYPE DIA. TYPE DIA. STRAIL Stay, Straight Top Straight Top Stoping	STRONE NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. TYPE 20" — 2 37" 4 52" 2 37" Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Straight Top Stopping	STRONE NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. DIA. NO. D	Tarber Tender Tender Tender Tender Tender Type Dia. No. Dia. Type Dia. Type Dia. Type Dia. Type Dia. Type Dia. Type Sloping No. Dia. Type TYPE TYPE TYPE TYPE TYPE DIA. No. DIA. TYPE DIA. TYPE DIA. TYPE SUpping SUPPRISE TRAILING SURFACE, SQ. FT. GRATE AREA GAUGE OAUGE OA	TYPE TYPE TYPE TYPE TYPE DIA. TYPE	


BROOKS LOCOMOTIVE WORKS BUILT BY

DUNKIRK, N. Y., U.S.A.

FOR THE BISAI RAILWAY

OF JAPAN.

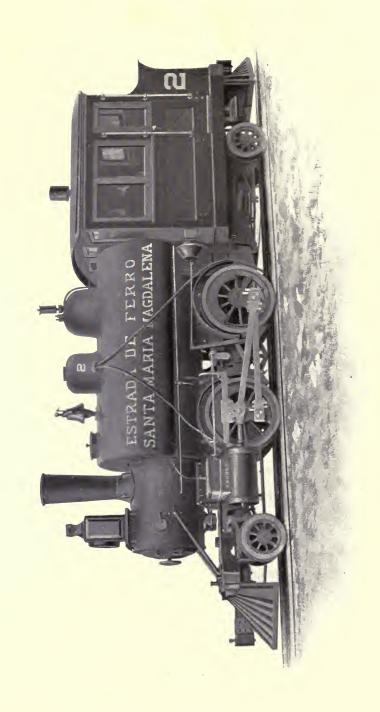
TYPE, 4-COUPLED DOUBLE ENDER TANK ENGINE.

CODE WORD, YUMAS.

CLASS, 12 A. P. Y. SERIES, 614.

SIDE TANKS, CAPACITY 700 U. S. GALLONS AND \$ TON FUEL.

		LENGTH WIDTH	72" 24"	S	TOTAL .	28000	ACK	INCHES	,,9	
BOX	LENGTH		72″	Pound	TOT	28	OF TR	5-1 5-2 5-3 5-4	3′-6″	
FIRE BOX		TYPE	Long, Sloping	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	LEADING	14000	GRATE AREA GAUGE OF TRACK	METRES	1.067	
	DIA.		42″	WORK	DRIVERS	36000	E ARE	SQUARE FEET	11.6	
BOILER	TYPE		tay,	T IN	DRI	36	GRAT	vačs	1	
B		TAT	Rad. Stay, Straight Top 42"	WEIGH	TRAILING	8000	j.	TOTAL	550	
	LEADING	NO. DIA.	4 24"	RAGE	£,		, SQ. F	TIPES	ı	
		NO.	4	AVE	TENDER		RFACE	ARCH PIPES		
	COUPLED DRIVERS	DIA.	42″	WHEEL BASE	ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	67.3	
WHEELS	COUPLE	NO.	4		SE),,	HEAT	FLUES	482.7
	TRAILING	NO. DIA.	2 24"		ENGINE	7'-6" 7'-6" 24'-0"	FUEL	<u>14</u>		
	TRA	NO.	8		RIGID			KIND	us Co	
	TENDER	NO. DIA.			DRIVING	,,9-			Bituminous Coal	
	STROKE	!	18″				RE	SQ. INCH SPHERE	Bi	
CYLINDERS	DIA, S	i i	12″	ES	LENGTH	9,-6	RESSUI		10	
CYLIN	TYPE		Simple 12"	FLUES	DIA.	$118 1\frac{3}{4} 9'$	BOILER PRESSURE	POUNDS PER SQ. INCH ABOVE ATMOSPHERE	165	
	Ţ		281		NO.	11	BO	G, "		



BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1891 FOR THE SANTA MARIA MAGDALENA RAHWAY

TYPE, 4-COUPLED DOUBLE ENDER SADDLE TANK ENGINE. OF BRAZIL. CODE WORD, YUPAS.

CLASS, 12 J. P. T. SERIES, 437.

TANK CAPACITY 700 U. S. GALLONS AND 1 TON FUEL.

PELES PRIED DRIVERS O. DIA. NO. DIA. TYPE AVERAGE WEIGHT IN WORKING ORDER, I FINE BOX TENDER THE BOX ANCH PIPES TOTAL SQUARE FEET HILLS BOILLER TYPE DIA. TYPE DIA. TYPE DIA. TYPE DIA. TYPE DIA. TYPE DIA. TYPE DIA. TYPE DIA. TYPE DRIVERS THABELS WHEELS THABELS TOTAL SQUARE FEET ANTHES OF TOTAL SQUARE FEET ANTHES DAY AND DEAD AVERAGE TOTAL SQUARE FEET ANTHES DAY AND DEAD AND	60" 24" POUNDS TOTAL ENGINE. 56000 F TRACK	$3'-3\frac{3}{8}''$
PELES DRIVERS O. DIA. O. DIA. 4 42" 2 24" Straight Top 40" AVERAGE WEIGHT IN WORKING TENDER TRAILING WHEELS TENDER TRAILING THRE BOX ARCH FITTES TOTAL SQUARE FEET A02 O. S.	Poun re En T S S S S S S S S S S S S S S S S S S	3,
PPLED DRIVERS O. DIA. 4 42" FINGINE AND TENTENDER TENTING SURF FIRE BOX 63	Deep GORDER, LEADING WHEELS 6000 GAUGE	1.000
PPLED DRIVERS O. DIA. 4 42" FINGINE AND TENTENDER TENTING SURF FIRE BOX 63	F IN WORKIND BRIVERS 36000 GRATE AREA SQUARE FEET	9.6
PPLED DRIVERS O. DIA. 4 42" FINGINE AND TENTENDER TENTING SURF FIRE BOX 63	E WEIGHT TRAILING WHEELS 14000 F. F.T. TOTAL	493
TEELS OUTLED DRIVERS NO. DIA. 4 42" FIRE BOX FIRE BOX 63	AVERAGI ENDER FACE, SQ. ARCH PIPES	
UPLLI UPLLI 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	HNE AND THE AND THE AND THE AND THE BOX	63
		430
STROKE	WHEEL WHEEL WHEEL **-8" 5'-8" 2 FUEL KIND	Bituminous Coal
	12" 18" UES 9'-0" 5 PRESSURE R 89, INCH MOSPHEKE	
CYLINDERS TYPE DIA. S Simple 12" FLUES NO. DIA. LENGT 92 2" 9'-0 BOILER PRESSUI POUNDS PER SQ. INCH ABOVE ATMOSPHERE 150		15



BUILT BY

BROOKS LOCOMOTIVE WORKS DUNKIRK, N. Y., U.S.A.

1897

FOR THE NANYO RAILWAY

CODE WORD, YUPONT.

TYPE, 4-WHEELED TANK ENGINE.

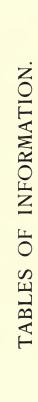
OF JAPAN.

CLASS, 8 E. Y. SERIES, 613.

SIDE TANKS, CAPACITY 360 U. S. GALLONS AND ½ TON FUEL.

FIRE BOX	LENGTH WIDTH	27" 245"	c, Pounds	TOTAL ENGINE	23000	GAUGE OF TRACK	FEET INCHES	2′-6″
FIRI	TYPE	Deep	TING ORDER	LEADING	-		METRES	.7628
BOILER	TYPE DIA.	Rad. Stay, Straight Top 30"	AVERAGE WEIGHT IN WORKING ORDER, POUNDS	DRIVERS	23000	GRATE AREA	SQUARE FEET	4.3
		Rad. Straig	AGE WEIGH	TRAILING		60. FT.	S TOTAL	234.4
	LEAD]	1	AVER	TENDER		URFACE, S	S ARCH PIPES	
WHEELS	COUPLED DRIVERS NO. DIA.	4 30″		ENGINE AND TENDER		HEATING SURFACE, SQ. FT.	FIRE BOX	22.4
WHI	TRAILING COUNO. DIA.	1	WHEEL BASE	ENGINE	4′-6″		FLUES	al 212
			WHEE	RIGID	4'-6" 4'-6" 4'-6"	FUEL	KIND	Bituminous Coal
	TENDER NO. DIA.	-		DRIVING				Bitum
CYLINDERS	TYPE DIA, STROKE	Simple 8" 14"	FLUES	NO, DIA, LENGTH	56 15" 8'-0"	BOILER PRESSURE	POUNDS PER SQ, INCH ABOVE ATMOSPHERE	150

FOR HAULING CAPACITY SEE PAGE 290.



EXPLANATION OF TABLES.

In the formulæ used to calculate the tables found on the succeeding pages, the following symbols are used:

- D == Diameter of cylinders in inches.
- = Length of stroke in inches.
- Diameter of drivers in inches.
- Boiler pressure.
- Mean available pressure in cylinders == mean effective pressure less an amount equivalent to the internal friction of the engine.
 - Weight of engine and tender in tons of 2000 pounds.
 - Tractive power in pounds.
- Hauling capacity = weight of train behind the draw bar in tons of 2000 pounds.
 - Speed in miles per hour.
 - Grade in feet per mile.
- Curvature of track in degrees.
- Resistance of train in pounds per ton of 2000 pounds, due to speed.
- Resistance of train in pounds per ton of 2000 pounds, due to grade.
- Resistance of train in pounds per ton of 2000 pounds, due to curves. || || || ||
- $R_s + R_m + R_c = \text{Resistance of train in pounds per ton of } 2000 \text{ pounds.}$

TABLE I.

TRACTIVE POWER OF LOCOMOTIVES.

This table gives the value of T for different values of p; it is calculated from the formula,

$$T = D^2 \times L$$

$$\times P$$

TABLE II.

NUMBER OF FEET THE PISTON TRAVELS PER ENGINE MILE.

This table is to enable one to find the speed of the piston in feet per minute when the stroke, driving wheel diameter and speed of engine in miles per hour are known. The table is in two parts, being divided by a diagonal line; the upper part gives the piston travel per engine mile as calculated from the stroke and driving wheel diameter, while the lower part gives the piston travel per engine mile as calculated from the piston speed in feet per minute and the speed in miles per hour at which the engine is running.

The use of the table is best explained by means of an example. Let us take a locomotive with 24" stroke and 62" The use of the table on the same line as 24" in the stroke a drivers, running at a speed of thirty miles per hour. In the upper part of the table on the same line as 24" in the stroke column, and under 62" diameter of drivers, is found 1301; now in the lower part of the table on the same line with thirty miles per hour look for the number nearest to 1301, which number, 1300, is to be found over a piston speed of 650 feet per minute. The piston speed of the engine in this example is therefore very close to 650 feet per minute.

TABLE III.

MEAN AVAILABLE PRESSURES AT DIFFERENT PISTON SPEEDS AND BOILER PRESSURES.

In order to avoid an extra calculation for the internal friction of the engine, the mean available instead of the mean effective pressures at the different piston speeds are given. The mean available pressure is the mean effective pressure, reduced by the amount that would be required to overcome the internal friction of the engine.

TABLE IV.

NUMBER OF REVOLUTIONS OF DRIVING WHEELS PER MILE.

This table gives the number of revolutions made by driving wheels of different diameters in running a mile.

TABLE V.

TRAIN RESISTANCE IN POUNDS PER TON.

In this table are given the values of train resistance for different grades and speeds. The resistances due to speed have been calculated from the formula:

$$R_s = \frac{S}{4} + 2$$

while for the grade resistances the formula

$$R_m=0.3788\ \mathrm{M}$$

has been used.

The values in the table are equal to R_s + R_m. On the line with a speed of 0 miles per hour are to be found the resist-

ances due to grade alone, while in the column under 0 grade, the resistances due to speed on a level track are given.

TABLE VI.

RESISTANCE OF CURVES.

The easiest way to account for the resistance due to curvature of the track is to find the grade that offers the same resistance as the curve in question. The resistance due to curvature is taken at ½ pound per degree of curvature.

$$R_c = 0.5 C$$

$$R_{\rm m} = 0.3788 \; {\rm M}$$

To find the equivalent grade put $R_c = R_m$

then
$$M = \frac{0.5}{0.3788}$$
 (0.3788)

Therefore, to find the grade equivalent of a curve multiply the curve in degrees by 1.32 and the result will be the equivalent grade in feet per mile. The grade equivalents are given in this table.

C = 1.32 C

TABLE VII.

SPEED IN MILES PER HOUR.

This table gives the speed in miles per hour for various diameters of drivers and different revolutions of same per

HAULING CAPACITY OF LOCOMOTIVES.

Then in Table I. find the tractive power corresponding to the diameter of cylinder, stroke, driving wheel diameter and the mean available pressure nearest to the one just found in Table III. After finding the grade equivalent of the curvature in Table VI., add it to the actual grade; then under this sum, and on a line with the speed in miles per hour in Table V., To find the hauling capacity of a locomotive, first find the piston speed by means of Table II., then look in Table III. for the mean available pressure corresponding to that piston speed and to the boiler pressure of the engine in question. ascertain the total resistance, R. The hauling capacity in tons is then represented by the formula:

 $H = \frac{T}{R} - W$

290

TABLE VIII

that is, the hauling capacity equals the tractive power divided by the resistance per ton, less the weight of engine and tender.

MEAN EFFECTIVE PRESSURE.

This diagram gives the ratio between the mean effective pressure on the piston and the boiler pressure at different piston speeds.

TABLE IX

MEAN AVAILABLE PRESSURE.

This diagram gives the ratio between the mean available pressure acting on the piston, and the boiler pressure at different piston speeds.

TABLE I.

Table I.—(Continued).

TRACTIVE POWER OF LOCOMOTIVES, IN POUNDS, FOR DIFFERENT MEAN EFFECTIVE PRESSURES.

DIAMETER OF DRIVERS					
F DR	20,,	680 972 1263 1555 1555 1846 2138 2430	794	25.92 907 1296 1685 2974 2462 2851 3240	29.16 1021 1458 1895 2770 3208 3645
FER C	48′′	20.25 709 1012 1316 1620 1923 2227 2531	23, 62 827 1181 1535 1889 2544 2598 2952	27.00 945 1735 1735 2160 2565 2970 8375	20.08 1068 1519 1519 1536 1536 1536 1536 1536 1536 1536 1536
AME	46′′	21.13 740 1056 1373 1690 2007 2324 2641	24.65 863 1232 1602 1972 2341 2711 3081	28.17 986 1408 1831 2254 2676 3099 3521	31.70 1100 1585 2060 2536 3011 3487 3963
Q	44′′	22.09 77.1 1104 1435 1767 2098 2430 2761	25.77 902 1288 1675 2661 2448 2835 3221	29.45 1031 1472 1914 2356 2798 3240 3681	2114 2157 2157 2651 2651 3148 3646 4143
	42,,	810 1157 1157 1504 1851 2198 2515 2802	945 1850 1750 1750 1750 1750 1750 1750 1750 17	30.86 1080 1513 2469 2469 2985 3858 3858	34.71 1215 1735 2256 2777 3287 3818 4339
	40′′	24.30 850 1215 1579 1944 2308 2673 3685	28.35 1417 1842 2693 2693 2693 3118 354	32,40 1134 1620 2106 2592 3078 3078 4050	28.45 1276 1822 2369 2916 3463 1010 4557
	38′′	25.58 895 1279 1662 2046 2430 2814 3197	29.84 1044 1492 1839 2887 2885 8786 3730	34.16 1193 1705 2728 2728 3239 3751 4263	38.37 1343 1918 2494 3069 3615 4721 4797
	36"	27.00 945 1350 1755 2160 2555 2970 3375	31,36 1102 1575 2647 2520 2520 2592 3465 355 355 355 355 355 355 355 355 355 3	36.00 1260 1280 2340 2340 2340 3420 3960 4500	40,50 1417 2025 2632 3240 3847 1455 5063
	34′′	28.58 1600 1429 1857 22286 2715 3144 3572	35.35 1167 1167 1167 2668 3668 4169 4169	38,12 1334 1906 2478 3049 3621 4765 4765	42,88 1501 278,44 278,7 40,78 5360
	32"	30.37 1063 1518 1974 2429 2885 3341 3796	25.44 1772 2803 2835 3866 3898 4430	2025 2025 2025 2632 3240 3847 4455 5063	25.56 1594 2273 2273 2561 3645 5011 5696
	30,,	32,40 1134 1620 2106 2592 3078 3564 4050	37.80 1323 1830 2457 3624 3691 4458 4725	43.20 1512 2169 2808 3456 4104 4752 5400	18.60 1701 2430 3150 3888 4617 5346 6075
	28′′	34,71 1214 1735 2226 2776 3297 3818 4339	10.50 1417 2025 2025 3240 3240 3847 4455 5061	46,28 1620 2314 3008 3702 4396 5091 5786	52.07 1822 2603 3385 4165 4946 5728 6510
MEAN	PRES.	- 18 8 8 8 8 8 8	- 25.6 5.8 5.5 5.	- 8888858	- 8888858
CYLINDERS	DIA, STROKE	9'' x 12''	, x 14, ''	9" x 16"	9'' x 18''

TABLE I.—(Continued).

DIAMETER OF DRIVERS								
OF DI	50′′	54 00	846 1200 1360 1920 2640 3000 3000	28.00	980 11400 11820 2240 2240 3080 3500	32.00	1120 1600 2080 2560 3040 3520 4000	36.00 1260 1800 1800 22340 22340 3420 3560 4500
ER (48′′	25.00	875 1250 1625 2000 2375 2125 3125	29.17	1021 1459 1896 2771 3209 3647	£	1167 1667 2167 2167 3167 3167 4167	37.50 1313 1875 2438 3000 3562 4126 4688
AMET	46′′	26.09	913 1305 1696 2087 2478 2870 3261	30.44	1065 1522 1972 1973 2832 2832 3805 3805	34.78	1217 1739 2261 2782 3304 3826 4348	39.13 1370 1956 2543 3130 3717 4305
DI	44"	27.27	954 1363 1772 2181 2500 3000 3409	31.82	1114 1591 2068 3023 3500 3500 3978	36.37	1273 1818 1818 2306 2406 4001 4547	40.91 1432 2045 2659 3273 3886 4501 5114
	42′′	28 57	1000 1428 1857 1857 2714 3143 3571	£ . 55	1167 1667 2167 2167 2666 3166 3667 4167	38.10	1353 1905 2476 3048 3619 4191 4763	12.86 1500 2743 2786 3429 4072 4715 5358
	40,,	30.00	1050 1500 1950 2400 2850 3350 3750	35.00	2820 2800 2800 3820 4550 4550	40.00	1400 22000 3200 3800 4400 5000	45.00 1575 2250 2925 3600 4275 4950 5625
	38′′	31.58	1105 1579 2053 2526 3600 3474 3948	36.84	1286 1842 1842 1994 1953 1960 1960 1960 1960 1960 1960 1960 1960	42.11	1474 2105 2737 3369 4000 4633 5264	47.37 1658 2368 3079 3790 4500 5211 5922
	36′′	33.33	1166 1667 2167 2667 3167 3667 4167	38.89	1361 1944 3111 3694 4278 4278 4861	14.45	1556 2289 2889 3556 4223 4890 5557	50.00 1750 2500 3250 4000 4750 5500 6250
	34′′	35.30	1285 1765 1765 1883 1883 1413 1413	41.18	2059 2059 3294 3294 4530 5148	47.06	1647 2853 3059 3763 1471 5171 5883	52.94 1853 2647 3441 4235 5029 5824 6618
	32"	37.50	1313 1875 2438 3000 3562 4125 4688	13.75	1531 2844 3500 4156 5469	50.00	1750 2500 3250 4750 5500 6250	56.25 1969 2812 3656 4500 5344 6188 7032
	30,,	40.00	1400 2500 3200 3800 5000	46.67	2	33.33	1806 2606 3406 3406 5066 5066 5867 6667	60.00 2100 3000 3900 4800 5700 6600 7500
	28,,	12.86	2143 2786 3429 4071 4715 5358	50.00	1750 2500 3250 4750 5500 6250	57.15	2800 2857 3714 4572 5480 6287 7144	64.29 2250 3214 4178 5143 6107 7072
MEAN Eff.	PRES.	1	155 155 155 155 155 155 155 155 155 155	1	8 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	1	85 50 110 125 125 125 125 125 125 125 125 125 125	1 12 0 20 20 20 11 12 12 12 12 12 12 12 12 12 12 12 12
CVLINDERS	DIA, STROKE	10" x 12"		10" x 14"		10" x 16"		10'' x 18''

Table I.—(Continued).

TRACTIVE POWER OF LOCOMOTIVES, IN POUNDS, FOR DIFFERENT MEAN EFFECTIVE PRESSURES.

DIAMETER OF DRIVERS								
F DR	88.	1186 1694 1694 2710 3218 4235 4235	38.72	1355 1936 2516 3097 3678 4259 4840	43,56	1524 2178 2178 2481 4792 5445	48,40	1694 2420 3146 3872 4597 5821 6650
ER 0	35,29	1285 1764 1885 1885 1411	40.33	2016 2016 2016 3821 4436 5041	15.37	1588 2268 2949 3629 4310 4310 5671	50,42	1764 2521 3227 4033 4790 5546 6302
AMET	36.83	1289 1841 2394 2394 2406 3498 4004 4004	45.09	1473 2704 2736 3998 4630 5261	47.35	1657 2007 3077 3787 4498 5208 5918	52.61	1841 2630 3419 4208 4208 5778 6577
DI 44″	38.50	13.47 1925 2502 2502 3685 4885 4813 4813	44.00	1540 2200 2800 2850 4180 4840 5500	49.50	2472 2477 3967 7470 6188 6188	55.00	1925 25730 25730 55730 5625 6636 6873
42′′	10.33	2016 2016 3226 3831 5041	46.09	1613 2804 2895 3687 4878 5070 5761	51.86	1815 2593 3370 4148 4926 5705 6483	57.62	2016 2881 3745 4609 5473 6338 7203
40′′	42.35	1482 2752 2752 1887 4023 4658 5294	48.40	1694 2420 3145 3871 4597 6050	54.45	1906 2722 3539 4555 5172 5990 6806	60,50	2017 3025 3932 4840 5747 6655 7363
38″	80.4	1560 2222 2897 3566 4235 4904 5572	50.94	17.85 25.47 33.11 46.75 46.89 68.67 63.67	57,31	2006 2865 3724 4584 5441 6304 7164	63.68	2228 3181 4139 5094 5094 7005 7960
36"	47.05	1646 2552 3658 3764 176 5176 5885	55.78	1882 2689 3495 4802 5108 5916 6721	60,50	2117 3025 3935 4840 5747 6655 7147	67.22	2352 3361 3361 5377 6385 7394 8402
34"	49.85	2491 3288 3985 4739 5480 6228	56.94	1993 2847 3701 4555 5409 6264 7118	64.06	2012 2012 2012 2012 2008 2008	71.17	2491 3558 5693 5693 7829 8896
32"	52.94	1853 2647 3441 4235 5629 5824 6618	60,50	2117 3025 3932 4840 5747 6655 7363	68.06	\$25 \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\ \frac{1}{2} \\	75.62	2616 3786 4915 6049 7183 8318 9452
30′′	56.46	1976 2823 3669 4516 5363 6210 7057	64.53	2525 4124 5162 7098 8066 8066	72.60	2541 3650 4718 5808 6896 6896 9075	80.66	2823 4033 5242 7662 7662 10080
28′′	60.50	2117 3025 3022 4840 5747 6655 7563	69.14	2420 3457 4494 5531 6568 7606 8643	77.78	25 88 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8	:	
MEAN EFF. PRES.	-	888888	-	888888	-	8588888	_	8288888
CYLINDIERS DIA, STROKE	11" x 14"		11" x 16"	20.1	11" x 18"		11" x 20"	

Table I.— (Continued).

DIAMETER OF DRIVERS 88" 40" 42" 44" 46" 48" 50" 52" 54" 56" 58" 60"	3.05 30.40 48.00 45.82 43.83 42.00 40.32 837 1764 1680 1604 1534 1470 1411 682 2520 2400 2291 2191 2100 2016 444 8275 3120 250 250 250 250 244 682 884 536 5506 3360 3225 640 4788 4500 4553 4164 3890 3805 683 5544 289 5490 485 4120 4455 682 6720 6000 5728 5477 5890 5640 428 7056 6720 4415 7880 5640	1.64 57, 60 54, 86 52, 36 50, 04 48, 00 46, 08 44, 31 42, 67 41, 14 0.82 28,80 27,43 2618 2502 2400 2304 2215 2138 2057 0.81 37,43 28,00 23,01 2215 2138 2057 851 68,14 37,42 29,10 23,01 22,13 2138 2057 851 68,14 37,44 400 23,01 22,13 2139 24,07 760 54,72 28,14 4188 4108 43,7 42,09 4054 38,08 760 54,72 28,14 42,7 42,00 43,7 42,09 4054 38,08 760 55,17 29,14 40,14 42,26 43,14 43,28 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 43,14 </th <th>8.8.7 2268 2160 2062 1974 1890 1814 1745 1680 1620 2114 2268 2160 2062 1974 1890 1814 1745 1680 1620 2114 212 4011 8829 3662 3590 3568 2249 2400 2814 212 4011 8829 3662 3590 3568 2249 2200 2814 213 451 5184 5184 5184 5184 5184 5184 5184</th> <th>652 252 0 08.57 65.46 62.46 69.05 57.69 55.38 58.34 51.43 49.65 48.00 652 252 0 2400 2291 2191 2100 2016 1938 1867 1800 177 1680 925 488 3100 2800 2800 2879 2871 2482 2400 926 488 4766 4255 4080 3800 2878 3817 3827 3120 930 6840 6314 6876 480 480 480 480 480 480 577 2480 5748 360 487 380 382 340 684 684 684 685 567 574 580 680 687 789 780 684 666 680 690 690 474 9000 887 780 884 765 780 680 <t< th=""></t<></th>	8.8.7 2268 2160 2062 1974 1890 1814 1745 1680 1620 2114 2268 2160 2062 1974 1890 1814 1745 1680 1620 2114 212 4011 8829 3662 3590 3568 2249 2400 2814 212 4011 8829 3662 3590 3568 2249 2200 2814 213 451 5184 5184 5184 5184 5184 5184 5184	652 252 0 08.57 65.46 62.46 69.05 57.69 55.38 58.34 51.43 49.65 48.00 652 252 0 2400 2291 2191 2100 2016 1938 1867 1800 177 1680 925 488 3100 2800 2800 2879 2871 2482 2400 926 488 4766 4255 4080 3800 2878 3817 3827 3120 930 6840 6314 6876 480 480 480 480 480 480 577 2480 5748 360 487 380 382 340 684 684 684 685 567 574 580 680 687 789 780 684 666 680 690 690 474 9000 887 780 884 765 780 680 <t< th=""></t<>
38.	26.52.05 26.52.0 3.44.8 0 50.40 0 50.40 0 58.36 0 66.32 0 66.32 0 742.8	0 60.64 0 2122 0 3032 0 3941 0 4851 0 5760 0 6670 1 7580 1 8490	0 2887 0 2487 0 3410 0 4483 0 5456 0 6480 0 7504 0 8527 0 8527	0 2652 0 3789 0 3789 0 4926 0 6063 0 7290 0 8337 0 9474 0 9474
34'' 36''	20.30 56.00 2075 1960 3855 2800 3855 3640 474 480 6523 6160 6523 6160 8303 7840	2372 2240 3388 3200 4405 4160 5421 5120 6438 6080 7455 7040 8472 8001 9488 8961	76.24 72.00 3812 3603 3812 3600 4955 4680 6099 5760 5242 6840 8386 7920 9530 9000	2964 2800 22964 2800 4235 4000 5506 5200 6776 6400 8477 6807 8047 7600 9318 8800 0590 10000 11860 11200
32" 34	(83.00 59 2205 20 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150 23150	72.00 67 2520 23 3600 33 4680 44 5760 54 7320 74 7920 74 7920 74 7920 74	81.00 76 2835 26 4050 38 5264 49 6480 60 7695 72 8810 83 1340 106	90.00 84 3150 42 4500 42 5850 67 7200 67 8550 80 9900 93 1250 105
30′′ 3	77.20 8360 8360 8360 8376 8376 8400 7392 8400 8400 8400	26.89 3840 3840 3840 3840 4992 4614 57296 68449 77296 100	<u></u>	8 64 19 13 2 2 13
MEAN EFF. PRES.	- 1868888 1 - 1868888 1	4555888 1 4555888 1 1088888 1	<u> </u>	- 18 28 28 28 28 2 - 18 28 28 28 28 28 28 28 28 28 28 28 28 28
CYLINDERS Not DIA. STROKE	12" x 14"	12" x 16"	12'' x 18''	12" x 20"

Table 1.—(Continued).

	.,99				26.34 28817 28817 28817 26198 7784 87887 87887 87887
	6477				58, 10 2033 2903 2905 3776 4618 5519 6391 7263 8134 9006
	62′′				59.97 2099 2098 3898 3898 4797 6597 7497 8896 9296
	,,09	45.07 1577 2253 22029 3605 4281 4281 4958 5634 6310	50.70 1774 25855 3295 4056 4816 5577 6888 7098	28.35 1971 2886 3661 4506 5351 6196 7041 7886	61.97 2169 3098 3098 4628 4628 7586 77746 8676 9606
	28′′	1631 1631 1631 3030 3720 3720 5720 5720 5720 5720 5720 5720 5720 5	52.45 1835 2622 3409 4196 4196 5770 6557 7343	2040 2040 2914 3788 4662 5586 6411 7285 8160	641.11 22244 3205 44167 5128 6009 7052 8014 8976 9937
Si	26′′	48.28 1690 22414 3138 3862 4586 5311 6035 6760	54.32 1901 2716 3530 1845 5160 5160 6790	60.36 2112 3018 3018 4828 4828 5734 6640 7545 8450	66.40 2324 3320 2330 6308 7305 7305 9296 10290
DIAMETER OF DRIVERS	54"	50.07 1752 2503 3254 4005 4756 5508 6259 7010	56.34 1972 2817 3662 4507 5352 6198 7043 7887	62.59 2190 3129 4068 5007 5007 5846 6885 7824 8763	68.86 2410 3443 4476 5508 6541 7573 8608 8608 9641
F DF	52"	52.00 1820 2600 3380 4160 4940 5720 6500	28,50 2925 3802 1680 5557 6435 7313 8190	65,00 2275 3250 4225 5200 6175 7150 8125	71,51 2503 3575 4648 5721 6733 7866 7866 10010
PER C	20,,	54.08 1803 2704 3515 4326 5137 5949 6760	60.84 2129 3042 3042 3954 4867 5779 6693 7605 8518	67.60 2366 3380 4394 5403 6422 7436 8450 8450 9464	74.36 2602 3718 4833 5948 5948 7064 8180 9295 10410
AMET	48′′	28.38 1971 28816 3661 4506 5351 6196 7041 7886	63.38 22218 3169 41119 5070 6021 2267 6372 8573 8578	24.64 2464 3521 4577 5689 6680 7746 8803 9859	27.47 27.11 38.73 508.5 61.97 7.359 85.22 96.81 108.40
DI	46"	58.78 2057 2057 2938 3820 4702 4702 5584 6466 7348 8229	23.14 23.14 33.06 42.98 52.90 62.82 72.75 82.67	25.48 2572 2572 2572 4776 5878 6880 8083 9185 10280	80, 83 2829 2829 5253 6466 7678 8891 11310 11310
	44′′	61.45 2150 3072 3994 4916 5837 6760 7681 8603	69.14 2420 3457 4494 5531 6568 7606 8643 9680	26.82 2688 2841 4993 6145 7298 8450 9603 10750	84,50 2957 4225 5492 5492 6760 8027 9295 11830 11830
	45′′	64.38 2253 3219 4184 5150 6116 7082 8048	2535 3621 4707 5794 6880 79654 10140	80,48 2816 4024 5231 6438 7645 8853 10060 11260	88.55 3098 4426 75734 7082 8410 9739 11060 13720
	40′′	67.60 2866 3880 4884 5408 6422 7486 8450 9464	76.05 2661 3802 4943 6084 7224 8366 9506	84.50 2957 4225 5492 6760 8027 9295 10560	92.36 3253 4648 6042 7436 8831 11620 111620 14110
	38′′	71.16 2490 3558 4625 5692 6760 7828 8895 9962	80,05 2801 4002 5203 5203 6404 7604 8806 10000 11200	88.94 8113 7777 7777 7777 7777 8449 9784 9784 9784	34.85 3425 1892 6360 7827 9295 10760 13700 15160
	36′′	75.11 2628 3755 4882 6008 7135 8262 9389 10510	84.50 2957 4225 5492 6760 8027 9295 10560	93.89 3286 4694 6103 7511 8919 10330 11730	9815 5161 5161 5161 8263 9812 11360 14460 16010
	34"	79,52 2783 3876 5168 6361 7554 8747 9940	80,47 8132 4476 5815 7157 8499 9842 11180	99,41 9479 6461 7953 944 10930 12420	
	32"	84.50 2957 4225 5492 6760 8027 9295 11830	95 06 3827 4755 6178 6178 7604 9030 10450 111880	3697 3697 5281 6866 8451 10030 11620 13200 14790	
	30,,	90.13 3154 4506 5858 7210 8562 9914 11260 12620			
MEAN	PRES.	- 25 2 8 2 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 55 5 5 5 5 5 1 1 1 1 1 1 1 1 1 1 1 1		- 888885858 - 8888858
	(4)	``	ò	,,0	
CYLINDERS	STROKI	× 16′	3″x 18	× ′	× 2
CYLI	DIA.		13,	13′,	13,

Table I.— (Continued).

TABLE 1.—(Continued).

IVERS 58" 60" 62" 64" 66" 68" 70"	(8), 83, 67, 50, 65, 32, 68, 28, 61, 36, 34, 34, 34, 34, 34, 34, 34, 34, 34, 34	77.59 75.00 72.59 70.31 68.1 N 271.5 2452 2540 2461 2386 38.79 3750 38.15 3515 3409 38.70 38.71 4576 431 720 7125 68.96 6879 647 770 7125 68.96 6879 647 970 10.85 7.755 7.30 970 10.60 10.60 98.44 59.45 20.20 11.620 11.250 10.900 10.570	85.34 82.50 79.81 77.34 75.00 2087 2887 2794 2707 2025 4267 1125 3892 3887 3750 6827 (680 6587 (6187 (600 8107 887 7585 7585 7547 7125 8107 887 8975 8975 8107 888 968 8950 81080 1550 1150 1050 10500	193.10 190.00 87.10 81.37 81.81 79.41 77.14 202.83 31.50 30.48 20.53 2.886 2772 2700 4655 4550 4587 418 409 3877 3857 7448 7500 6808 6749 6544 6553 617 8844 8550 8274 8015 777 754 728 1150 1900 5629 9284 6900 8736 848 1160 11850 1080 10540 10550 1080 943 14430 13850 1350 1800 12050 12080 12310 11850
OIAMETER OF DRIVERS ' 52" 54" 56" 58" 6	72.32 (8) 2531 (8) 2531 (8) 2531 (8) 2531 (8) 2531 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 (8) 2535 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50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50.36 50	58.39 58.39 57.45 57.45 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 58.89 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TER 0	2625 3750 4875 6000 7125 8250 9375 10500	83,33 2916 4166 5416 5416 6666 7916 9167 11660 11660	3208 3208 4583 5958 7383 8708 10080 11460 14210	3506 5000 6500 6500 8000 9500 11000 12500 15500
JAME 52"	272.8 272.6 3894 5062 6230 7398 8567 10900 12070	86.54 3028 4327 5624 6923 8221 9520 10820 12110	95.19 3331 4759 6187 7615 9043 10470 11900 13320 14750	3634 3634 5192 6749 8307 9864 11420 12980 14540 16090
D 20,,	81.00 2835 4050 4050 5264 6480 6480 7695 10120 11340 11340 12550	90.00 3150 4500 5850 7200 8550 9900 11250 13950	199.00 3465 4950 6435 6435 7920 9404 10890 12374 13860	3780 5400 5400 7020 8640 110260 11880 118500 15120 15120
48′′	29.53 4.218 5.4218 5.4218 5.4218 6.749 8.015 9.282 11.810 11.810	98.75 98.81 4687 6694 7500 8906 10310 11720 13120	3609 3609 5156 6703 8249 9796 11340 11340 11340 12890 12890	3888 3888 5625 7313 9000 10690 12370 14060 15750
46′′	88.04 3081 4402 5723 5723 7013 8364 12320 12320 12320 13640	3424 3424 4891 6359 7826 9293 10760 12230 13690 15160	37.66 37.66 538.0 699.4 850.8 1022.0 11.83.0 13.45.0 15.66.0	2 117.39 4108 5869 7630 11150 11150 12910 14670 16430 16430
44"	20.04 4602 2082 2082 2363 744 10120 11500 12880 14260	2.2011 3579 5114 6647 8182 9716 11250 12780 14320 15350	4 112. 5 3938 5625 5625 7313 9000 10690 12370 14060 15750 17440	122.72 4296 6137 7378 9818 11660 13500 13500 13500 13780
42′′	5 96.42 3875 4821 6267 7712 9160 12050 13500 14540	3750 3750 3858 6865 8572 10180 11780 13390 15000 16610	117.84 1286 1286 1428 11190 14730 14730 16500 18270	128.57 4500 6429 8357 10280 12210 14140 16670 18600 18600 18600
40′′	8543 5062 5062 6581 8100 9618 11140 11140 12650 12650	3938 3938 3938 5625 7313 9000 10690 12370 14060 15750	123.7 4331 6187 8044 8044 1750 1750 13610 17320 17320 17320	135.00 4725 6750 8775 12820 12820 14850 16870 16870 18900
38′′	3730 3730 3730 6928 6928 11720 11720 11720 16920 16920	118.40 +114 5920 7697 9473 11250 13020 14800 16570 18350	130.25 4559 6513 8467 10420 12370 14330 16280 18240 18240	142.10 4973 7105 9236 11370 13500 15630 17760 19890 22020
36′′	112.50 3938 5625 7313 9000 10690 12370 14060 15750	125.00 4375 6250 8125 10000 11870 13750 17500 17500	4812 6875 8838 11000 13060 17190 17190 17190 17190 17190	
34"	119.10 4169 5955 7742 9529 11310 13100 14890 16670 18460	132.34 4632 6618 8663 10580 12570 14560 16540 16540 18530 20510		
Mean Epp. Pres.	- REBERETE	- 88888585E	- 25252555 - 2525255 - 25555 - 25555 - 25555 - 25555 - 2555 - 255	- %%&%%5%5%
CYLINDERS DIA. STROKE	15'' x 18''	15'' x 20''	15'' x 22''	15" x 24"

Table I.— (Continued).

Table I.— (Continued).

	.,91			91.26 4563 5932 7300 8670 110040 11410 12770 14140 15510 16880
	74"			93.73 1686 6092 7498 8904 11710 11710 13120 14530 17310
	72"			96.33 4816 6261 7706 9151 12040 13480 13480 14380 16370 17820
	70′′	\$2.57 4128 5367 6665 7844 9083 10320 11560 14030 15270	90, 83 4541 5903 7266 8629 9991 11350 12710 15740 15740 16800	99.08 1951 6440 7926 9412 10380 13870 15380 168840 168840 168840
	,,89	85.00 4250 5525 6806 8075 9850 11906 111906 13170 14450	93.50 4675 6077 7480 8882 10280 11690 13090 15890 15890 17300	6689 6422 6493 5978 5784 5419 5255 5100 6689 6422 6493 5978 5784 5419 5255 5100 6689 6422 6493 5978 5784 5419 5255 5100 6689 6422 6493 5978 5784 5272 6444 6831 6689 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870 6870
	.,99	4378 4378 5692 7005 8319 9633 10940 12260 13570 14880	96.34 4817 6262 7707 9152 10590 12040 12040 13490 14550 16380	5255 6831 8407 9983 11560 13130 14710 16290 17860 17860
RS	64"	90.32 4516 5870 7225 8880 9935 11290 112610 14000 16710	99.34 6457 7947 7947 10930 12420 13540 16830 16830 18380	108.38 5419 7044 8670 10290 11920 13550 13170 16800 16820 18420 20050
DIAMETER OF DRIVERS	62"	93.22 4661 6059 7457 8856 10250 11650 11450 17250	5127 6664 8202 8202 9741 11280 12820 14350 17430 17430	5594 5594 7272 8950 1980 12300 12300 12300 12300 12300 12300
OF D	,,09	96,34 +817 6261 7707 9152 10600 12040 13490 14930 16370	5298 6888 6888 8477 110670 11660 11820 11830 11830 11830 11830	115.60 5780 7514 9248 10980 12720 14450 16180 16180 17920 17920 17920
TER	58′′	99.65 1982 1972 1946 1946 11395 1540 1540 1540 1540 1540 1540	20250	5979 5777 7777 7777 7950 71130 113130 114930 114930 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140 115140
HAME	26,,	2 103, 20 5160 6708 8 8256 9 805 11350 11250 11450 11540 11540	7.752 7.7580 9083 10780 114190 17600 17600 19300 19300	3 123, 84 8 8051 9 8068 1 1780 1 13620 1 1340 1 17340 1 17340
2	54′′	B1, 38 125 55 120, 41 115 60 111, 16 107, 02 6568 6283 6021 5756 5558 5532 5510 8168 7827 7514 7226 6057 6510 10050 9624 9248 8893 8563 6450 1080 1440 10860 10770 6450 1380 13210 1279 1230 1170 6450 15710 15050 1450 15800 1580 5280 1530 6860 6160 6560 6480 5280 2430 5860 1660 1890 5280 2430 2620 21300 2050 1800 5260 24300 2320 21300 2060 1800 5260 5260 2250 21300 2060 1800 5260 5260 2250 21300 2060 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 1800 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 5260 5260 5260 1800 1800 1800 5260 5260 5260 1800 1800 1800 5260 5260 5260 1800 1800 1800 5260 5260 5260 1800 1800 1800 5260 5260 1800 1800 1800 1800 5260 5260 5260 1800 1800 1800 1800	27.712 5887 7653 7653 11180 11180 114720 16480 16480 18250 18250 1780 20010	848.43 8348 8348 10270 10270 14130 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 17980 1
	52"	5558 5558 1 7226 1 8883 1 10560 1 12230 1 13890 1 15560 1 17230 1 17230 1 17230	207.28 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147 61147	
	50′′	1115.60 177 7514 1 9248 1 12720 1 12720 1 14150 1 16180 1 16180	6623 6558 8610 8265 8610 10170 10550 10170 12580 12080 14570 13890 16560 15890 16560 15890 20530 19710 20520 21620 21500 23520	138.71 6 6936 8 1017 1 1090 1 13180 1 15260 1 1540 1 1540
	48′′	6021 6021 7.827 8.634 11440 13240 15050 16860 18660 22280	1132.45 8610 10500 11580 11580 11580 11580 11580 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650 11650	20250 1580 1780 1780 1780 1780 1780 1780 1780 17
	46′′	8 125.65 8 6283 8 168 9 11936 1 11936 1 1739 1 1739 1 1739 1 1739 1 1948 1 1948	6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911 6911	2 150.78 7538 9 800 12060 14320 14320 14320 16580 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18850 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 18950 1895
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	42"	7605 7225 6881 9887 891 891 891 9887 891 891 891 891 891 691 691 691 691 691 691 691 691 691 6	88, 7568 89, 7568 0 9840 0 12110 0 14380 0 16650 0 18920 0 23460 0 25730 0 25730	21.55.12 825.7 10.730 13210 15690 15690 28120 28070 28070 28070
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	38.	7605 9887 12170 1450 16730 19010 19010 25250 25860 25860 25860		
MEAN Eppe.	PRES	1 5 5 8 8 6 5 5 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	- 5888554558	- 88 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8 8
HERS	STROKE	20′′	22,′′	24"
CYLINDERS	I.V. ST	17" x 20°	17" x	x x
C	Ω			

Table I.— (Continued).

	78′′		6920 6743 . 8517 8299 . 10110 9855 . 11710 11410 .	14520 16080 17630 19190 20740	7225 8892 10560 10230 11380 11380 11230 11230 11320 22230
	,,94	98.87 4943 6427 7909 9392 10870 12360 13840 15820 16810 18290	6920 8517 10110 11710 13310	14900 16500 18100 19700 21290	7415 9127 10840 12550 12550 17850 17880 17880 19890 21100 22820
	74′′	507.7 6600 8123 9646.11170 11170 14210 15740 18780	7108 8748 8748 10390 12030 13670	15310 16950 18590 20230 21870	7615 9372 11130 12890 12890 14640 16400 18160 18160 19920 21670 221670
	72"	5218 5218 6784 8349 9914 111480 13040 14610 16180 17740 19310	7305 7305 8991 10670 12360 14050	15780 15310 14900 14520 17420 16350 16550 16500 16080 19100 18390 1810 17630 22480 21870 21230 20740 190 41 117 15 114 09 111 14	7827 9634 111440 113240 113050 115050 115660 1252280 222280 24080
10	,,01		7514 9248 10980 12720 14450		8051 9908 111760 111760 115480 119200 221050 22210
DIAMETER OF DRIVERS	,,89	121.19 117.40 113.84 110.50 107.22 1000 3870 5692 5525 55047 5727 5782 7400 7183 6077 5782 7400 7183 6077 5782 7400 7183 6077 5782 7400 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 1080 108	19.00 1 7735 9520 11309 13090 14870		
DR.	,,99	5692 7400 9108 10810 12520 12520 14230 15940 17640 17640 17640 17640	7970 9808 111650 13490 15320		
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METH	62′′	6060 7877 9695 11510 11510 11510 11510 11510 1250 16960 18780 20600	8483 10440 12400 14350 16310	_	9090 111180 11180 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 113280 11328
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CYLINDERS	DIA, STROKE	17" x 26"	17'' x 28''	17" x 30"	

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	52"	.87.08								29470 31520		0626	11960	14200	00497	20930	23180	25420	20000	32150	162.00									34830	37260
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	48″	54.95 148,50 1	9653	11880	16330	18560	20730	25240	27470	31930	162.00	10530	12960	15390	000000	55630	25110	20070	32400	34830	06.671	11110	9	16670	19310	04570	27200	29830	25470		40370
	46,,	54.95								33310 35640	185.12 176.71 169.03 162.00							31270		38880	91,45 183,12	11000	14636	17390					0223		42120
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	42′′	17.691	11030	13580	18670	21210	287.09	28850	31400	980 1 80 1 1 180 1 80 1 180 1 180 1 180 1 180 1 180 1 180 1 180 1 180 1 18	185, 12	12030	11810	17580	20:350	25920	28690	34250	37020	39800 12580					:			:	:		:
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CYLINDERS		18" x 22'									18'' x 24''										18" x 26"										
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ERS	STROKE	, 4,	, , 92	
CYLINDERS		19′′ x 24′	19′′ x 26″	19'' x 28''
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TABLE I.— (Continued).

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	52′′	208.28.3 113540 119780 222910 22280 22280 22280 22280 22280 22280 22280 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22540 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 2250 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 22550 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 2250 22	22.22 14440 17770 17770 22440 27770 34440 41100 441100 47770 41100 41170	
	50′′	216.60 114080 17530 220570 220570 227070 308280 40070 40070 44070 46570 48820		
MEAN	PRES.	2 2 1 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 3 3	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
ERS	STROKE	x 30,′′	32′′	34′′
CYLINDERS		19'' x 3	19'' x 32''	19'' x 34''
C	DIA.			

TABLE I.— (Continued).

TRACTIVE POWER OF LOCOMOTIVES, IN POUNDS, FOR DIFFERENT MEAN EFFECTIVE PRESSURES.

	84"	7428 7428 10850 112570 112570 117710 19430 17710 19430 228550 24570	8049 8049 11760 11760 11760 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11780 11	8667 8667 10670 116670 116670 116670 116670 226670 226670 226670 226670 226670 226670
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CYLINDERS N	DIA. STROKE	21"x 26"	21'' x 28''	21" x 30"
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Table I.— (Continued).

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54′′	16980 20900 24820 24820 228750 38670 36580 46510 44420 48350 56180 60110		
MEAN EFF. PRES.	1 58 8 8 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 2 8 8 8 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
CYLINDERS DIA. STROKE	21" x 32"	21" x 34"	21.' x 36''

Table I.— (Continued).

DIAMETER OF DRIVERS	. 50" 52" 54" 56" 58" 60" 62" 64" 66" 68" 70" 72" 74" 76" 78" 80" 82" 84"	271,04 260,69 250,95 242,09 233,64 225,86 218,58 211,75 205,32 199,30 193,60 188,11 178,31 178,71 160,40 165,27 161,33 1760 1630 16310 15720 15190 14680 14210 13760 13340 12590 12590 11590 11590 1160 10740 10480 23750 24750 2480 26290 24450 20760 2010 1350 1880 1880 1880 1280 1280 1260 1050 13550 13220 1270 25880 25770 2480 2560 2450 2450 2450 2450 2570 2570 1280 1280 1280 1280 1280 1280 1280 128	259, 20 208, 89 250, 28 250, 31 242, 00 254, 18 226, 87 220, 00 215, 72 207, 43 201, 66 196, 20 191, 06 181, 50 177, 08 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 86 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172, 87 172,	286, 84 276, 57 207, 63 258, 13 249, 70 242, 00 234, 66 227, 78 21, 26 215, 11 240, 29 303, 78 193, 60 188, 88 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 184, 38 18 184, 38 18 184, 38 18 184, 38 18 184, 38 18 184, 38 18 18 18 18 18 18 18 18 18 18 18 18 18
CYLINDERS MEAN EFF.		22' x 28' 1 271.0 65 176 86 216 87 216 87 217.0 110 208 125 218 126 129 127 149 128 128 128 128 129 129 129 129 129 129 129 129 129 129 129 129 129 129 129 129 129 129 22" x 30" 1	22" x 32" 1 65 88 88 88 88 88 88 88 88 88 88 88 88 88	

Table I.— (Continued).

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CYLINDERS	DIA.	22′′′	22"	22"
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CYLINDERS	DIA. STI	23'' x 28'	23.′ x 30.′	23'' x 32'
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CYLINDERS	DIA. STROKE	23" x 34"			23" x 36"		23"x 38"

OF DRIVERS 76" 78" 80" 82" 84"	0 227.38 221.52 216.00 210.73 205.71	14780 14100 14040 18180 1728 17280 25500 21540 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 25570 2	48880 47630 46440 45310 52290 50950 49680 48470	8 222, 54 236, 30 230, 40 224, 75 219, 42 1 15740 15346 14970 14610 14260 1 25140 25450 15340 15530 1 25140 25450 25450 25470 24140 1 25150 25530 25450 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25470 24140 1 25150 25530 25530 24530 1 25150 25530 25530 25530 1 25150 25530 25530 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2
DIAMETER 64" 66" 68" 70" 72" 74"	0.270,00.261,82.254,12.246,86.240,00.233,50	17550 17020 16320 21600 28040 20033 25550 24870 241-0 29700 28870 27230 31750 187500 31650 55380 17500 31650 55380 18500 44510 42200 48950 44410 47200 54000 52460 50820	58050 56220 54530 53070 51600 62100 65220 58450 56770 55200	9 288.00 279.27 271.08 263.31 256.00 249.08 310 18720 18130 17520 17110 16640 16190 25340 25340 24520 24540 25340 24520 24540 25340 24520 24540 24520 24540 24520 24540 24520 24540 24520 24540 24520 24540 24520 24540 24520 24540 24520 24540 24520 24540 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 24520 2520 2
Mean Bee. Pres. 54" 56" 58" 60" 62"	1 320,00 308,57 297,92 288,00 278,70	20050 19360 18729 24680 2835 233140 29310 28300 2730 38340 2770 31680 88570 37240 30000 17240 41720 41620 17380 41610 41640 57480 50550 48900 6710 56580 57600	68800 66340 64050 61920 73600 70970 68530 66240	1 129, 14 317, 80 307, 20 297, 229
CYLINDERS DIA. STROKE	24" x 30"			24,' x 32,' x 34,' x 34

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MEAN	PRES.		8 5 8 5 8 5 8 5 8 5 8 8 8 8 8 8 8 8 8 8	- 69	28255	8 8 2 2 2 3	215 230 1	\$25225555 \$2525555
ERS	STROKE	,,9		,/88			0	
CYLINDERS		24" x 36"		24'' x 38'			4 ′ × 4	
CV	DIA.	2		61			2	

TABLE II.

NUMBER OF FEET THE PISTON TRAVELS PER ENGINE MILE.

		Speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed In It is a speed
	28"	1200 1580 1580 1580 1580 1580 1580 1580 15
	30,,	
	32"	1470 1190 1470 1445 1470 1445 1470 1445 1470 1445 1470 1446 1470 1446 1470 1476 1470 1
	34"	11865 11867 1779 1779 1779 1779 1779 1779 1779 17
	36"	105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105 105
	38′′	8.8.1 1106.1 114.15.8 136.0 17.0 17.0 17.0 17.0 17.0 17.0 17.0 17
	40′′	840 1100 1100 1100 1100 1100 1100 1100 1
	42"	800 840 960 1008 1120 176 1120 176 1140 1512 1160 1680 1761 1880 1761 1885 2081 2207 2081 2207 1300 1400 1300 1680 1300 1680 1300 1680 1300 1680 1300 1680 1300 1680
	44 ′′	764 917 1222 1372 1528 1528 1528 1528 1980 1980 1980 1980 1980 1980 1980 198
	46′′	731 877 877 1102 1102 1100 1100 1100 1100 1100 11
LS	48"	7008 840 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 11280 112
WHEELS	20,,	6 672 8 807 8 807 10 11 11 11 11 11 11 11 11 11 11 11 11 1
	52"	7776 11163 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 11253 1
DRIVING	54′′	7477 7477 7477 7477 7477 7477 7477 747
DRI	26"	800 800 800 800 800 800 800 800 800 800
OF	58/	811 159 821 1159 821 1159 821 1159 821 1159 821 1159 821 1159 821 1151 1151 1151 1151 1151 1151 1151
TER	,,09	8896 11008 11120 1232 1232 1344 1344 1346 1568 1689 1709 1709 1709 1709 1709 1709 1709 170
DIAMETER	62"	867. 1084. 11193. 1400. 1400. 1400. 1510. 1873. 1873. 1873. 1874. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870. 1870.
DI	64′′	945 945 1155 1155 1155 1150 1150 1150 1150 11
	,,99	917 1100 1100 1100 1100 1100 1100 1100 1
	.,89	986 1084 11884 11884 11884 11884 11884 11884 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 11873 118
	70′′	9.00 9.00 9.00 9.00 9.00 9.00 9.00 9.00
	72"	11120 11120 11120 1120 1120 1120 1120 1
	74"	11090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 111090 11090 11090 11090 11090 11090 11090 11090 110
1	, 91	973 973 1061 1150 1150 1150 1150 1150 1150 1150
	78,,	1120 1120 1120 1120 1120 1120 1120 1120
	80,,	10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008 10008
	82"	984 1008 1008 1011 1011 1011 1011 1011 10
	84	100 100 100 100 100 100 100 100 100 100
STROKE		11110 022222222222222222222222222222222

PISTON SPEED IN FEET PER MINUTE

Table III.

MEAN AVAILABLE PRESSURES AT DIFFERENT PISTON SPEEDS AND BOILER PRESSURES.

	1500		170	9	7	<u>*</u>	10	100	000	62
	1400		-0+	#	7	īc	133	600	:3	67
	1300		~	17	10	90	99	1 9	33	îŝ
	1200		46	51	900	09	(3)	9/	7	62
	1100		00	5.5	99	13	07	13	ŝ	ŝ
	1000	ļ	000	99	13	17	97	37	X.	33
	950		170	33	<u>x</u>	+1~	2	iĝ.	16	26
	006		09	99	:7	x-1-	30	96	96	102
TE	850		33	69	17	€	X	- - - - - - - - - -	101	107
MINI	800	1	67	72	œ	27	† 6.	100	107	+
PER	750		7.1	67	ž	33	100	107	<u>+</u>	121
FEET	700		17	ž	31	66	107	11.5	122	1:30
NI	650		8	6°	16	105	=======================================	22	1:30	<u> </u>
PEED	009		278	96	101	113	551	1:31	68:1	2
SNO	550		33	20	115	121	130	1:39	6+1	158
PIST	500		66	108	118	128	138	1+1	158	167
	450		105	116	156	137	1+1	158	891	179
	400		113	174	133	1+6	158	691	200	761
	350		119	131	71	154	991	178	961	202
	300		124	136	149	161	23	36	198	510
	250		129	1+1	古	167	180	19:3	202	21 22
	200		251	9+1	159	175	132	861	211	225
	150		134	×	191	175	<u>x</u>	202	215	553
	100		135	149	162	9/1	186	203	216	530
BOILER	Pressure		150	165	180	195	210	225	240	255

Table IV.

NUMBER OF REVOLUTIONS OF DRIVING WHEELS PER MILE.

DIAMETER OF DRIVERS	28′′	30′′	32"	32" 34" 36"	36′′	38′′	40,,	42′′	40" 42" 44" 46" 48"	46′′	48′′	20,,	52′′	54′′	26"
Revolutions per Mile	720.3	672.2	630.3	593.2	560.2	530.7	504.2	504.2 480.2	458.4 458.4	438.4	420.2	403.4	887.8	373.5	360.1
DIAMETER OF DRIVERS	28′′	,,09	62"	64′′	,,99	,,89	68" 70" 72" 74" 76"	72′′	74".	.,91	78′′	80,,	82.,	84′′	
Revolutions per Mile	347.7	336.1	325.3	315.1	305.5	296.6	288.1	280.1	272.5	265.3	258.5	252.1	245.9	240.1	

TRAIN RESISTANCE IN POUNDS PER TON. TABLE V.

	2.46	130	24 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	300	89 91 1 1 2 5 6 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1
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	2.08	110	######################################	280	0.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
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RESISTANCE OF CURVES. Table VI.

8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 Equivalent Grade in Feet Per Mile-1.32 x degree of curve. GRADE EQUIVALENTS OF CURVES 9 rO. 1 2 3 4 DEGREE OF CURVE.

CURVE RESISTANCE=.05 pound per degree of curvature.

TABLE VII. SPEED IN MILES PER HOUR.

DIAMETER OF DRIVING WHEELS

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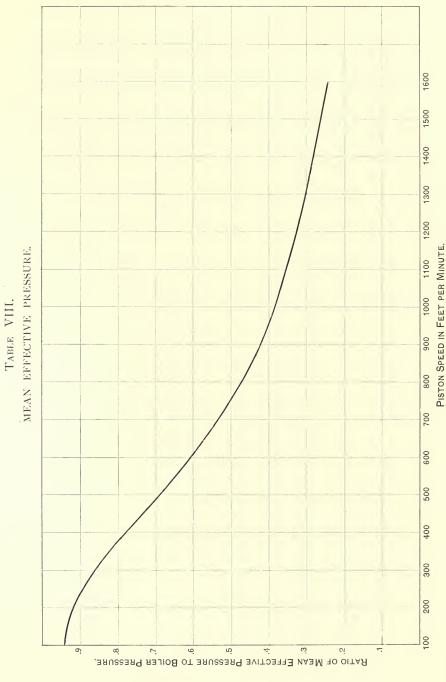
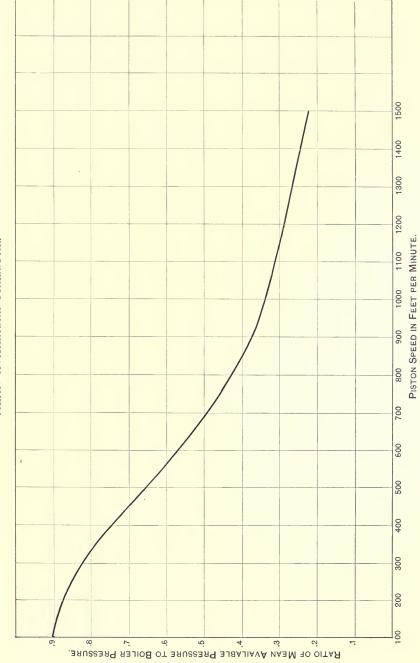
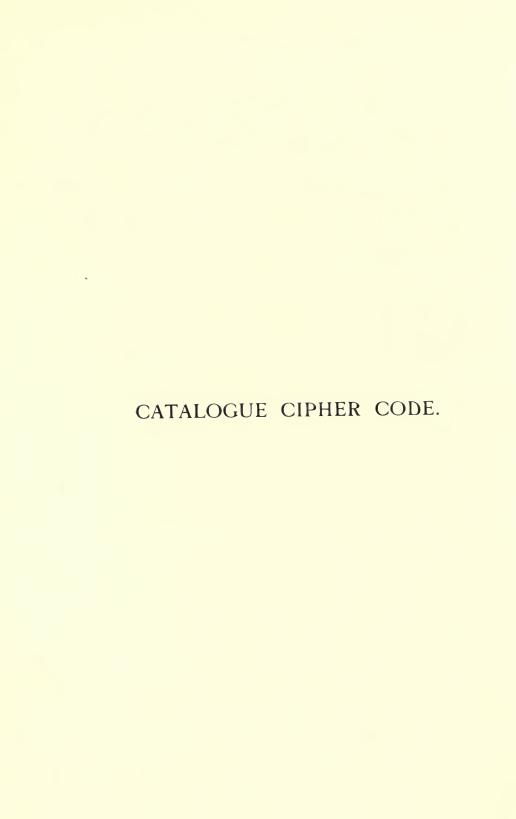


TABLE IX.
MEAN AVAILABLE PRESSURE.





CATALOGUE CIPHER CODE.

Code Word	MESSAGE
Oakman	Wire price, earliest delivery, and mail specifications coveringlocomotives, similar in general design to that described in your 1899 Catalogue, under Code Word
OAKUM	Wire price, earliest delivery, and mail specifications coveringlocomotives, similar in 'general design to that described in your 1899 Catalogue, under Code Wordexcept
OARLOCK	Wire price, earliest delivery, and mail specifications coveringlocomotives, duplicates of those last furnished us.
Oasis	Wire price, earliest delivery, and mail specifications coveringlocomotives, duplicates of those last furnished us, except
Оатн	Wire price, earliest delivery, and mail specifications coveringlocomotives, duplicates of those furnished us
	Wire price, earliest delivery, and mail specifications coveringlocomotives, duplicates of those furnished usexcept
	We will furnish you locomotives, similar in general design to that described in our 1899 Catalogue under Code Word
OBDALE	delivered f. o. b
OBDROME	delivered alongside vessel, New York Harbor.
OBDUCE,	
OBED	We will furnish youlocomotives, similar in general design to that described in our 1899 Catalogue under Code Wordexcept
OBEGO	delivered f. o. b.
Овекко	
OBELISK	delivered alongside vessel
	We will furnish youlocomotives, duplicates of those we furnished you
OBELUS,	
OBERON	
OBERUS	
UBESE	We will furnish youlocomotives, duplicates of those we furnished you except
OBEY	delivered f. o. b
Овіме	
Овіт	
	We will furnish youlocomotives, duplicates of those we last furnished you, fordollars each, delivered at
Овјоти	
Obkale	
Oblate	delivered alongside vessel
OBLAW	exceptdollars each, delivered at
Oblese	
Obletto	,
	Quotation is for plain engine only. By a plain engine is meant one having steel fire-box, charcoal iron tubes, steel tyred driving wheels and cast iron engine truck (bogie) and tender truck wheels. It does not include brakes, copper fire box, brass tubes, headlights or other extras as coded on pages 326 and 327 of this catalogue.
OBLICEE	Are you prepared to tender forlocomotives, similar in general design to that described in your 1899 Catalogue, under Code Wordfor delivery not later than
	We will submit tender by first outgoing mail, coveringlocomotives, similar in general design to that described in our 1899 Catalogue, under Code Worddelivery
	Are you prepared to tender forlocomotives, similar in general design to that described in your 1899 Catalogue, under Code Wordexcept
Oblong	We will submit tenders by first outgoing mail coveringlocomotives, similar in general design to that described in your 1899 Catalogue under Code Word except
OBLUS	We are unable to tender. Have written,
	Enter our order forlocomotives, as described under Code Word

Code Word	MESSAGE
Ового	Enter our order forlocomotives, as described under Code Word
OBSCURE	exceptlocomotives, duplicates of those last furnished us.
	Enter our order forlocomotives, duplicates of those last furnished us except
	Enter our order forlocomotives, duplicates of those furnished us
	Enter our order forlocomotives, duplicates of those furnished us
Obsign	Enter our order forlocomotives, as per { our } message of
	Enter our order. Have written.
	Have entered order, will confirm by mail.
	If specifications can be modified to readour price will be defined to modified to readour price will be defined to read
	If specifications can be modified to readwe will tender.
	You may modify specifications to read
	Specifications cannot be modified.
	Omit from the construction
	Omit from the constructionand include
	Tenders will be opened
	Your tender must be here not later than
	We will cable proposal
	We will mail proposal
	Our proposal mailed
Овтах	We will arrange to make shipment via steameras desired.
	We will make shipment via steamerif possible.
	Impossible to make shipment via steamer
	Cannot make shipment in time for steamerwill ship by next boat
OBTENGO	Shipment oflocomotives made to-day.
Овтерро	Will make shipment oflocomotives
OBTERT	Locomotives will go forward on steamer
OBTEST	Have locomotives arrived at
OBTEVAL	. Will locomotives be completed within the specified time?
OBTEW	The locomotives will be completed within the specified time.
	. We can complete the locomotives within the time specified, if complete details are furnished at once.
	Impossible to complete engines within the time specified. Have written.
	locomotives now completed.
	locomotives completed to-day.
_	Can you make delivery oflocomotives withinmonths?
	Name earliest delivery
	Name earliest delivery alongside New York.
	Name earliest delivery alongside
	Earliest delivery alongside New York
	Earliest delivery alongside
	Earliest delivery
	Delivery not later than
	Delivery not earlier than
	CONSTRUCTION.
	Locomotives to have cylinders one-half inch larger diameter.
	Locomotives to have cylinders one inch larger diameter.
	Locomotives to have cylindersinches larger diameter.
	Locomotives to have cylinders one-half inch smaller diameter.
	Locomotives to have cylinders one inch smaller diameter.
	Locomotives to have cylindersinches smaller diameter. Locomotives to have stroke of pistoninches longer.

Code Word

MESSAGE

warman with processors of	
	Locomotives to have stroke of pistoninches shorter.
OBTUSE	Locomotives to have diameter of cylinders and stroke of piston of same dimensions
	as engine described in † your † 1899 Catalogue under Code Word
Овтито	Locomotives to be equipped with Brooks Improved Piston Valves,
	Locomotives to have driving wheelsinches diameter.
	Locomotives to have engine truck (bogie) wheelsinches diameter.
	Locomotives to have Player Patent Improved Belpaire Boilers.
	Locomotives to have Radial Stay Wagon Top Boilers.
	Locomotives to have Straight Top Boilers.
	Gauge of trackmillimeters,
	Driving wheel base must not exceedinches.
	Driving wheel base must not exceedmillimeters.
	Rigid wheel base must not exceedinches.
	Rigid wheel base must not exceedmillimeters.
	Total wheel base of engine must not exceedinches.
Obvidore	Total wheel base of engine must not exceedmillimeters.
OBVIDUNT	Total wheel base of engine and tender must not exceedinches.
	Total wheel base of engine and tender must not exceedmillimeters.
	Total weight of engine must not exceedpounds in working order.
	Total weight of engine must not exceedkilogrammes in working order.
	Total weight on driverspounds in working order.
	Total weight on driverskilogrammes in working order.
	Total weight of tender, loadedpounds.
	Total weight of tender, loadedkilogrammes. Height of engine from top of rail must not exceedinches.
	Height of engine from top of rail must not exceedmillimeters.
	Must have tank capacity of
	Must have tank capacity ofimperial gallons.
	Must have tank capacitycubic inches,
Овушто	. Must have tank capacityliters.
	. Fuel, bituminous coal.
	. Fuel, anthracite coal.
	Fuel, wood or coal.
OCADOR	·
Ocadus	What is the estimated cubical measurement of each engine knocked down and packed for sea shipment?
Ocafale	The estimated cubical measurement of each engine knocked down and packed for sea shipment iscubic feet.
	. What is the estimated weight of each engine knocked down and packed for sea
	shipment?
Ocafarn	. The estimated weight of each engine knocked down and packed for sea shipment is pounds.
Ocafarod	iskilogrammes.
	. What is the weight of heaviest piece?
	The weight of heaviest piece ispounds.
OCALA	
	. What is measurement of bulkiest piece ?
	The measurement of bulkiest piece is
	What is the weight per yard of rail on which engines are to run?
Ocator	. Weight of rail per yard ispounds iskilogrammes.
	. What is heaviest grade?
	. Heaviest grade does not exceedfeet in 100 feet.
	. Heaviest grade does not exceedfeet per mile.
	. What is length of heaviest grade?
	. Length of heaviest grade does not exceed feet.
	. What is radius of sharpest curve?
	. Radius of sharpest curve does not exceedfeet.
Occido	
	907

Code Word	MESSAGE
OCCIPITAL	What is length of turntable?
	Length of turntable isfeet.
OCCITUM	millimeters.
	Send dimensions of smallest tunnel.
	Send profile of road.
	Wire at once lettering and numbering for locomotives.
	Letter locomotives as follows:
	Number locomotives as follows:
	Cost of freight and insurance from New York is
OCCUMOLO	Cost of freight and insurance from
	EXTRA EQUIPMENT.
OCCUPANT	Include the following extra equipment in your tender;
	Quote price at which you will furnish the following extra equipment, per engine.
	Quotation includes the following extra equipment
	Extra equipment for each engine will cost as follows:
	You may furnish and apply to each of the engines you have under construction for us, the following extra equipment, at the price you have quoted for same.
Occupyor	To price quoted add for extra equipment for each engine as follows.
	BRAKES.
	Hand brakes on drivers.
	Steam brakes on drivers.
OCEANIC	Hand and steam driver brakes.
	American steam driver brake.
	American steam engine truck brake.
	Westinghouse tender brake.
	Westinghouse train brake.
	Westinghouse tender and train brake, 8-inch pump. Westinghouse tender and tender brake, 9½-inch pump.
	American-Westinghouse driver, tender and train brake, 8-inch pump.
	American-Westinghouse driver, tender and train brake, 9%-inch pump.
	New York air brake on drivers.
	New York air brake on tender.
	New York air brake on train.
	New York air brake on tender and train.
	New York air brake on drivers, tender and train.
	Eames vacuum brake on drivers.
	Eames vacuum brake on tender.
	Eames vacuum brake on train.
	Eames vacuum brake on tender and train.
OCTILLION	Eames vacuum brake on drivers, tender and train.
	Smith automatic brake on drivers.
	Smith automatic brake on tender.
	Smith automatic brake on train.
	Smith automatic brake on tender and train.
	Smith automatic brake on drivers, tender and train.
	American practice.
Octoroon	Railway Co.'s practice.
	BOILER COVERING.
OCTOYL	
OCTUPLE	
	Sectional asbestos.
	Sectional magnesia.
OCULIST	John's fire felt.

CATALOGUE CIPHER CODE.—(Continued.)

Code Word	MESSAGE
Oculus	BELL RINGER — Gollmar.
Ocuster	— Heginbottom.
Octtor	— Sansom,
	COUPLERS. American automatic M. C. B. standard. Screw — English practice.
Oninin	FIRE-BOX. Copper fire-box, brass tubes,
	Copper fire-box, iron tubes.
ODAX	Copper me-box, non tubes.
	HEADLIGHTS.
Oddity	Ordinary American pattern, square case, 18-inch reflector.
Odds	Ordinary American pattern, round case, 18-inch reflector.
	Ordinary American pattern, square case, 23-inch reflector.
	Ordinary American pattern, round case, 23-inch reflector.
	Special pattern.
	Electric (National).
	Electric (Pyle National).
Objous	Three head lamps (Japanese style).
ODIUMAL	JACKS, TRAVERSING. Ten tons capacity. Twelve tons capacity. Fifteen tons capacity.
	SANDING DEVICE.
	Leach sander, single pipe.
	Leach sander, double pipe. Houston sander.
ODONTOAX	Houston sander.
ODONTOID	SYPHON, withfeet of hose.
	TIRES.
Odopare	Krupp, crucible.
Odopass	Krupp, open hearth.
0	mp a grygg
	TRACINGS, one set.
Odorant	
ODORINE	three sets.
Odorous	TRAIN SIGNAL, Westinghouse.
ODVLIC	WRECKING FROGS, one,
ODYLINE	
	•

CALENDAR CODE.

	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE
1	Nab.	Napus.	Natch.	Navew.	Needle.	Neocene.
2	Nabit.	Narcosis.	Nates.	Navicular.	Needy.	Neocracy.
3	Nabob.	Narcotic.	Nath.	Navigable,	Neese.	Neogen.
4	Nacre.	Narcotine.	Nathmore.	Navigate.	Nefand.	Neology.
5	Nadir.	Narcotism.	Natica.	Navy.	Nefast.	Neomorph.
6	Nagor.	Nard.	Naticord.	Nawab.	Negation.	Neonism.
7	Naid.	Nardine.	Nation.	Nawl.	Negative.	Neophyte.
8	Naik.	Nardoo.	National.	Navt.	Neginoth.	Neoplasm.
9	Nail.	Nares.	Native.	Nazarene.	Neglect.	Neorama.
10	Nainsook.	Nargile.	Nativity.	Nazarite.	Negligee.	Neoteric.
11	Nais.	Narica.	Natka.	Naze.	Negoce.	Neozoic.
12	Naive.	Nariform.	Natrium.	Neal.	Negress.	Nepa.
13	Naked.	Narine.	Natralite.	Neap.	Negritta.	Nepenthe.
14	Naker.	Narrate.	Natron.	Nearctic.	Negritic.	Nephew.
[5	Nakoo.	Narrative.	Natter.	Neat.	Negro.	Nephrite.
16	Nale.	Narrator,	Natty.	Nebalia.	Negroid.	Nepotic.
17	Namby.	Narthex.	Natural.	Nebular.	Negus.	Nepotism.
18	Namo.	Narwal,	Nature.	Nebule.	Neif.	Neptune.
9	Nandine.	Nasal.	Naufrage.	Nebulose.	Neigh.	Nereid.
20	Nandu.	Nascal.	Naught.	Neck.	Neighbor.	Nerita.
21	Nankeen.	Nascent.	Naughty.	Neckband.	Nelumbo.	Nero.
22	Nanny.	Nash.	Nausea.	Necking.	Nemaline.	Nervate.
23	Nanpie.	Nasiform.	Nauseate.	Necklet.	Nemato.	Nerve.
24	Naos.	Nasion.	Nautch.	Necktie.	Nematoid.	Nervine.
25	Nape.	Nassa.	Nautic.	Necrolite.	Nemean.	Nervous.
26	Naphtha.	Nasute.	Nautical.	Necrose.	Nemertid.	Nescience.
27	Napthol.	Natal.	Nautiform.	Necrotic.	Nemesis.	Nesh.
8	Napkin.	Natalin.	Nautilus.	Nectar.	Nemoral.	Nest.
29	Napless.	Natant.	Naval.	Nectarine.	Nempne.	Nestle.
0	Nappe.		Navarch.	Nedder.	Nenia.	Nestor.
1	Napping.		Nave.		Nentor.	

	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
1	Netfish.	Nickar.	Nimmer.	Nocive.	Nomadic.	Noontide.
2	Nether.	Nickel.	Ninefold.	Nock.	Nomarch.	Noose.
3	Netify.	Nicking.	Ninny.	Noctam.	Nombril.	Nopal.
4	Netting.	Nickname.	Niobate.	Noctuid.	Nome.	Norian.
5	Nettle.	Nicotic.	Niobe.	Noctule.	Nomen.	Norite.
6	Netty.	Nicotine.	Niobium.	Nocturne.	Nomial.	Norma.
7	Network.	Nictate.	Nipper.	Nocturnal.	Nomic.	Normal.
8	Neural.	Nidary.	Nipping.	Nocuous.	Nominal.	Norse.
9	Neuralgia.	Nide.	Nipple.	Nod.	Nominate.	Nosel.
10	Neuraxis.	Nidget.	Nirvana.	Nodal.	Nominee.	Nostril.
11	Neurine.	Niding.	Nisan.	Nodation.	Nonage.	Nostrum
12	Neuro.	Nidor.	Niste.	Nodder.	Nonagon.	Notable.
13	Neuroma.	Nidulate.	Nisus.	Noddle.	Nonane.	Notary.
14	Neuron.	Nidus.	Niter.	Noddy.	Nonce.	Notarial.
15	Neurosis.	Niece.	Nitrate,	Node.	Nonda.	Notate.
16	Neurotic.	Nief.	Nitride.	Nodical.	Nonego.	Notch.
17	Neuter.	Niello.	Nitrify.	Nodular.	Nones.	Notion.
18	Neutral.	Niggard.	Nitrile.	Nodule.	Nonetto.	Notist.
19	Newel.	Niggle.	Nitroform.	Noel.	Nonius.	Notum.
20	Newsboy.	Nigh.	Nitrol.	Noemic.	Nonoic.	Nouch.
21	Newt.	Night.	Nitrum.	Noetic.	Nonpareil.	Nougat.
22	Newton.	Nightfall.	Nivose.	Nog.	Nonplus.	Nounal.
23	Nexible.	Nightmare.	Nixie.	Noggin.	Nonsane.	Nourish.
24	Nexus.	Nightshade.	Noah.	Noils.	Nonsense.	Noursel.
25	Nias.	Nigrine.	Nobby.	Noise.	Nonsuit.	Novation.
26	Nibble.	Nihil.	Noble.	Noisette.	Nonylic.	Novel.
27	Nicolite.	Nilotic.	Nobility.	Noisome.	Noodle.	Novelist.
28	Nicene.	Nilt.	Noblesse.	Nolde.	Nook.	Novice.
29	Nicety.	Nimble.	Nobley.	Nole.	Noon.	Novitiate.
30	Niche.	Nimbose.	Nocent.	Nolition.		Noxious.
31	Nick.	Nimbus.		Nomad.		Noyance.

NUMERICAL CODE.

1	Sabal,	68	Salebrous.	150	Sanga.	232	Satiate.	314	C1!
16 16 3 16	Sabaoth,	69	Salep.	151		233	Satiety,	315	Scantling.
8	Sabbat.	70	Salic.	152		234	Satinet.	316	Scape. Scaphite.
16	Sabean,	70 71	Salicin.	153		235	Satin.	317	
16 16 16 16 16 16 16 16 16 16 16 16 16 1	Sabella,	72	Salicyl.	154		236	Sation.	318	Scaphoid.
16	Sabre.	73	Salient.	155		237	Satire.	319	Scapple. Scapula.
7	Sabian.	7.1	Saliferous,	156		238	Satirist.	320	
16	Sabine.	74 75	Salify.	157	Sanious.	239	Satisfy,	321	Scapulet.
2 9	Sable.	76	Saligat,	158		240	Satisty,	322	Scar, Scarab,
16	Sabot.	77	Salina.	159		241	Satrap,	323	
11	Sabulose.			160		241		324	Scarce.
1 1 1 6 3 4	Sac.	78 79	Salique, Salite,	161	Sanjak. Sankha.	243	Saturate.	325	Scarcity.
4	Sacalait.	80	Saliva.	162		244	Saturn.	326	Scard.
16	Sacaran.	81	Saliva. Salivant.	163		245	Saturnian.	327	Scarf.
. ģ	Sacar. Saccate.	82	Salivant.	164		246	Saturnine.	328	Scarify.
13 7 8 15 16 1		83	Salix.	165		247	Satyr.	329	Scarlet.
1	Saccharin.	84	Sallet.	166		248	Satyric.		Scarmage.
3	Saccharoid. Saccharum.	85	Sallow.	167		248	Sauce.	330	Scarp.
- 5	Sacchalic.			168	Santon,	250	Saucisse.	332	Scarry.
4		86 87	Sally.	169		251	Saucy.		Scarus.
5	Sacchulmic.		Salmi.	159		251	Sauger.	333	Scatch.
6	Sacciform.	88 89	Salmiac.	170 171	Sapan.	202	Saul.		Scathe.
7	Saccule.	90	Salmon,		Sapful.	253 254	Saunter.	335	Scatter.
8	Sacculus,		Salmonet.	172	Sapid.		Saurel.	336	Scaup.
9	Saccus.	91	Salogen.	173	Sapient.	255	Saurian.	337	Scavenger.
10	Sacellum.		Salol.	174	Sapless.	256	Sauroid.	338	Scelet.
11	Sacerdos.	93	Saloon,	175 176	Sapling.	257	Saury.	339	Scene.
12	Sachem.	94	Salpa.	176		258	Sausage.	340	Scenery.
13	Sachet.	95	Salpicon.	177	Saponite.	259	Sauterne.	341	Scenic.
14	Sack.	96	Salpinx.	178		260	Savage.	342	Scent.
15	Sackbut.	97	Salse.	179	Saporific.	261	Savagism.	343	Scentless.
16	Sackcloth.	98	Salsify.	180	Sapota.	262	Savant.	344	Scepter.
17	Sacking,	99	Salsoda.	181	Sapper.	263	Savement.	345	Schedule.
18	Sacque.	100	Salt.	182	Sapphic.	264	Savor.	346	Scheme.
19	Sacral.	101	Saltant.	183		265	Savory.	347	Schemer.
20	Sacrament.	102	Saltation.	184	Sappho.	266	Savoy.	348	Schism.
21	Sacrate.	103	Saltatory.	185		267	Sawbill.	349	Scholar.
22	Sacre,	104	Saltern.	186		268	Sawbuck.	350	Scholium.
23	Sacred.	105	Saltpetre.	187	Saraband.	269	Sawder.	351	School,
24	Sacrifice.	106	Salubrity.	188		270	Sawdust.	352	Schooner,
25	Sacrilege.	107	Salutary.	189	Sarcasın.	271	Sawfly.	353	Sciatic.
26	Sacrist.	108	Salute.	190		272	Sawmill.	354	Science.
27	Sacristan.	109	Salvable,	191	Sarcel.	273	Sawset.	355	Scientist.
28	Sacrum.	110	Salvage.	192		274	Sawyer.	356	Scimiter.
29	Sadden.	111	Salvation.	193	Sarcin.	275	Saxatile.	357 .	Scintilla.
30	Saddle.	112	Salvatory.	194		276	Saxhorn.	358	Sciolist.
31	Saddlery.	113	Salver,	195		277	Saxifrage.	359	Scion.
32	Sadducee.	114	Salvitic.	196	Sarcoblast.	278	Saxon.	360	Scioptic.
33	Sadiron.	115	Salvo.	197	Sarcode.	279	Saxonic.	361	Scissel.
34	Safeguard.	116	Samara.	198	Sarcoderm.	280	Sayette.	362	Scissors.
35	Safety.	117	Samaroid.	199	Sarcoma,	281	Scab.	363	Sclerite.
36	Saffron.	118	Samaritan.	200	Sarcosis.	282	Scabby.	364	Scoff.
37	Safranin.	. 119	Sambo.	201	Sarcotic.	283	Scabbard.	365	Scold.
38	Saga.	120	Sambuke.	202	Sarcous.	284	Scabling.	366	Scolex.
39	Sagacity.	121	Sambur,	203		285	Scad.	367	Scomber.
40	Sagamore.	122	Samian.	204		286	Scaffold.	368	Sconce.
41	Sagapen.	123	Samiel.	205	Sardine.	287	Scaglia.	369	Scoop.
42	Sage.	124	Samite,	206	Sardins.	288	Scalar.	370	Scoot.
43	Sagene.	125	Samlet.	207	Sardonic.	289	Scald.	371	Scope.
44	Sagenite.	126	Samoan.	208	Sardonyx.	290	Scaldic.	372	Scoppet.
45	Sagger.	127	Samovar.	209		291	Scale.	373	Scorbute.
46	Saginate.	128	Samp.	210	Sargo.	292	Scalene.	374	Scorch.
47	Sagitta.	129	Sampan.	211	Sark.	293	Scaling.	375	Score.
48	Sago.	130	Samphire.	212	Sarkin.	294	Scalled.	376	Scoria.
49	Sagum.	131	Sample,	213	Sarlac.	295	Scallion,	377	Scorify.
50	Sahib.	132	Samshoo.	214		296	Scallop	378	Scorn.
51	Sahidic.	133	Samson.	215	Sarment.	297	Scalp.	379	Scornful.
-52	Saic.	134	Sanative,	216	Sarong.	298	Scalpel.	380	Scorpene.
53	Saikyr.	135	Sanatory.	217	Saros.	299	Scalper.	381	Scorpio.
54	Sailor.	136	Sanctify.	218	Sarplar.	300	Scaly.	382	Scorpion.
55	Saimir.	137	Sanction.	219		301	Scamble,	383	Scorse.
56	Sainfoin.	138	Sanctity.	220		302	Scamillus,	384	Scotch.
57	Saint.	139	Sanctum.	221	Sart.	303	Scamp.	385	Scoter.
58	Saintlike.	140	Sand.	222	Sash.	304	Scamper.	386	Scotist.
59	Saithe.	141	Sandal.	223	Sasin.	305	Scan.	387	Scotomy.
60	Saiva.	142	Sandarac.	224	Sassafras.	306	Scandal.	388	Scotsman.
61	Sajene.	143	Sandix.	225	Sassolin.	307	Scandent.	389	Scottish.
62	Saker.	144	Sandman.	226	Sastra.	308	Scandia.	390	Scoundrel.
63	Saki.	145	Sandre.	227	Satan.	309	Scandic.	391	Scour,
64	Salaam.	146	Sandwich.	228	Satanic.	310	Scansion.	392	Scourge.
65	Salad.	147	Sandwort.	229	Satchel.	311	Scant.	393	Scout.
66	Salagane.	148	Sandyx.	230	Sate.	312	Scantily.	394	Scowl.
67		149	Sane.	231	Satellite.	313	Scantle.	395	
		- 10							

								74
396	Scrag.	478 Secure.	560	Serang.	642	Shatter.	724	Siccate.
397	Scraggy.	479 Sedate.	561	Serape.	643	Shave.	725	Sickish.
398		480 Sedative.	562		644	Shaveling.	726	Sickle,
	Scramble.			Seraph.				
399	Scrape.	481 Sedge.	563	Seraphic.	645	Shaving.	727	Sickly.
400	Scrappy.	482 Sediment.	564	Seraphim.	646	Shawl.	728	Sideral.
	Scrappy.		565		647	Shawnee.	729	Siderite.
401	Scratch.			Serapis.				
402	Scrawl.	484 Sedum.	566	Serenade.	648	Sheaf.	730	Sidewise.
403	Scrawny.	485 Seedless,	567	Serene,	649	Shealing.	731	Siege.
					650		732	
404	Scream.	486 Seedtime.	568	Serenity.		Shearer.		Sienna.
405	Screech.	487 Seeker.	569	Serge.	651	Shears.	733	Sierra.
406	Screed.	488 Seeming.	570	Sergeant.	652	Sheath.	734	Siesta.
407	Screen.	489 Seemly.	571	Serial.	653	Shedder.	735	Sieve.
408	Screw.	490 Seer.	572	Seriation.	654	Sheen.	736	Sifter.
409	Scribble.	491 Seesaw.	573	Sericite.	655	Sheepcot.	737	Sigh.
	Scribble.					Sheepeot.		Olgii.
410	Scribbling.	492 Seethe.	574	Sermon.	656	Sheepfold.	738	Sightless.
411	Scribe.	493 Segment.	575	Sermonic.	657	Sheepish.	739	Sigil.
412	Scrim.		576	Serosity.	658	Sheepskin,	740	Sigma.
			570				7.44	
413	Scrimmage.	495 Seignor.	577	Serous	659	Sheik.	741	Sigmoid.
414	Scrimp.	496 Seismic.	578	Serpent,	660	Shekel.	742	Signate.
415		497 Seismal.	579	Serrate.	661	Shekinah.	743	Signet.
	Script.							
416	Scriptory.	498 Seizure.	580	Serrator.	662	Sheller.	744	Silence.
417	Scripture.	499 Sekos.	581	Serried.	663	Shellfish.	745	Silent.
	Scripture.		582	Serum.	664	Shelter.	746	Silenus.
418	Scrofula.							
419	Scroggy.	501 Seldom.	583	Servage.	665	Shelve.	747	Silex.
420	Scroll,	502 Select.	584	Serval.	666	Sheol.	7.18	Silken.
							F 40	
421	Scrub.	503 Selection.	585	Servant.	667	Shepherd.	748 749	Sillock.
422	Scruple.	504 Selenic.	586	Servile.	668	Sherbet.	750	Silo.
423	Scrutator.	505 Selenite.	587	Servitude.	669	Sheriff.	751	Silurian.
							701	
424	Scrutiny.	506 Selfish.	588	Sesame.	670	Sherry.	752	Silvan.
425	Scuddle.	507 Selfsame.	589	Sesamoid.	671	Shield.	753	Silvate.
426	Scuff.	508 Selfwill.	590	Sesban.	672	Shifter,	754	Simian.
427	Scuffle.	509 Selvage.	591	Sessile.	673	Shiftless.	755	Simile.
428	Sculler.	510 Semaphore.	592	Session.	674	Shiloh,	756	Simmer.
429	Scullion.	511 Sematrope.	593	Sesterce.	675	Shimmer.	757	Simony.
		off Sematrope.			010		101	
430	Sculpin.	512 Semblance.	594	Sethia.	676	Shindy.	758	Simoom.
431	Sculptor.	513 Semester.	595	Seton.	677	Shine.	759	Simper.
	Scuiptor.		596	Settee.	678	Shiner.	700	Simplist.
432	Sculpture.					Diminut	760	
433	Scum	515 Semitone.	597	Setter.	679	Shingle.	761	Simulate.
434	Scupper.	516 Senate.	598	Setula.	680	Shinto.	762	Sinapine,
407			599	Sever.	681	Shirk.	700	Sincere.
435	Scurf.	517 Senegal.					763	
436	Scurry.	518 Senile.	600	Severe.	682	Shirting.	764	Sinch.
437	Scurvy.	519 Senior.	601	Sewage.	683	Shiver.	765	Sindon,
	Scurvy.	510 .jcinor.					700	
438	Scutal.	520 Senna.	602	Sewer.	684	Shoal,	766	Sinecure.
439	Scutcheon.	521 Sennet.	603	Sextain.	685	Shoat.	767	Sinew.
440	Scutella.	522 Senora.	604	Sextant.	686	Shoddy.	mao	Sinful.
							$\frac{768}{769}$	
441	Scuttle.	523 Sensate.	605	Sextette.	687	Shogun,	769	Singer.
442	Scutum,	524 Sensation.	606	Sextile.	688	Shola.	770	Singleton.
443	Scylla.	525 Sense.	607	Sexton.	689	Shoot.	771	Sinister.
				Sexton.			111	
444	Scythe.	526 Senseless.	608	Shabby.	690	Shopman,	772	Sinker.
445	Seacoal.	527 Sensitive,	609	Shack	691	Shopworn,	773	Sinner.
		528 Sensor.	610	Shackle.	692	Shortage.	774	Sinless.
446	Seagirt.	526 Selisor.				Cl.	11-1	
447	Seal.	529 Sensorium,	611	Shad.	693	Shorthand.	775	Sinoper.
448	Seam.	530 Sensory.	612	Shadow.	694	Shotted.	776	Sinque.
449	Seaman.	531 Sensuous,	613	Shady.	695	Shoulder.		Sinuate.
							777	
450	Seamless.	532 Sentence,	614	Shaffle.	696	Shout.	778	Sinus.
451	Seamster.	533 Sentient.	615	Shag.	697	Shove.	779	Siphoid.
452		534 Sentiment.	616	Shaggy.	698	Shovel.	1 780	Sipid.
	Seance.				699			
453	Sear.	535 Sentinel.	617	Shagreen.		Shower.	781	Sipple.
454	Search.	536 Sentry.	618	Shaken.	700	Showman,	782	Sircar.
455	Seasick.	537 Sepal.	619	Shaker.	701	Shrapnel,	783	Siren.
					702			Sirius.
456	Season.	538 Sepaline.	620	Shako.	102	Shrew.	784	Sirius.
457	Seat.	539 Separator.	621	Shale.	703	Shrewish.	785	Sirloin.
458	Sebate.	540 Separatrix.	622	Shallop.	704	Shriek.	786	Sirocco.
			623		705		700	Sirrah.
459	Sebic.	541 Sepia.		Shallow.		Shrieve.	787	
460	Secant.	542 Sepose.	624	Sham.	706	Shrift.	788	Sisal.
461	Secede.	543 Sepoy.	625	Shaman.	707	Shrill.	789	Siskin.
			626		708	Shrimp.		Sister.
462	Secession.	544 Sepsin.		Shamble.			790	
463	Seckel,	545 Sepsis.	627	Shame.	709	Shrine.	791	Sistine.
464	Seclude.	546 Septate.	628	Shameful.	710	Shrivel.	792	Sistrum.
			629	Shammer.		Shroud.		Situate.
465	Seclusion.	547 Septette.			711		793	
466	Secrecy.	548 Septic.	630	Shamois.	712	Shrub.	794	Situs.
467	Secret.	549 Septiform.	631	Shampoo.	713 714	Shrug.	795	Sivan.
		550 C		Champool	71.1		700	Sizar.
468	Secretary.	550 Septoic.	632	Shamrock.	114	Shuck.	796	
469	Secretion.	551 Septulate.	633	Shank.	715	Shudder.	797	Sizzle.
470	Sect.	552 Septulum.	634	Shanty.	716	Shuffle.	798	Skag.
			635		71"	Shumac.	799	Skaldic.
471	Sectarian.	553 Septum.		Shapely.	717			
472	Sectary.	554 Sepulcher.	636	Shard.	718	Shutter.	800	Skate.
	Sectile.	555 Sequel.	637	Shark.	719	Shuttle.	801	Skean.
473								Skeel.
474	Section.	556 Sequence.	638	Sharock.	720	Shyster.	802	
475	Sector.	557 Sequester,	639	Sharper.	721	Sibilant.	803	Skelder.
	Secular.	558 Sequin.	640	Sharpling.	722	Sibyl,	804	Skelly,
476		and requiii.		Charten.				
477	Secund.	559 Seraglio.	641	Shaster.	723	Sibylline.	805	Skelter.

-						-	
806	Chaptia	000	Sucas	070	Cour	E2000	C-1!-
807	Skeptic.	888	Snare. Snarl.	970 971	Sour. Source.	53000 54000	Splenic.
808	Skewer. Skiff.	890	Snatch.	972	Sources.	55000	Splinter. Splurge.
809	Skillet.	891	Snattock.	973	Souse.	56000	
810	Skim.	892	Sneaking.	974	Soutane.	57000	Splutter, Spoiler,
811		893	Sneaking. Sneer.	975		58000	
812	Skimmer, Skimp.	894	Sneeze.	976	Souter. Souvenir.	59000	Spondee.
813		895	Snicker,	977	Sozzle.	60000	Sponge,
814	Skinny.	896	Snipe.	978	Spacious.	61000	Sponsor, Spooler,
815	Skipper.			979		62000	
816	Skirl.	897 898	Snivel. Snobbish.	980	Spaddle.	63000	Sporadic.
817	Skirmish. Skirt.	899	Snood.	981	Spade. Spadille.	64000	Sportful,
818	Skittles.	900	Snowy.	982		65000	Spotless.
819			Showy.		Spadix.	66000	Spousal,
820	Skiver.	901 902	Snub.	983 984	Spadroon.		Sponter.
821	Skulk.		Snuff.		Spale.	67000	Sprain.
822	Skull.	903	Snuggle.	985	Spalt.	68000	Sprawl.
823	Slabber.	904	Soaker.	986	Spancel	69000	Spray.
824	Slacken.	905	Sobbing.	987	Spandrel.	70000	Sprightly.
	Slag.	906	Sober.	988	Spang.	71000	Sprinkle.
825	Slake.	907	Social.	989	Spangle.	72000	Sprinter.
826	Slam.	908	Socle.	990	Spaniel.	73000	Sprite.
827	Slander.	909	Socratic.	991	Spanker.	74000	Sprout.
828	Slang.	910	Soda.	992	Spanner.	75000	Spruce.
829	Slant.	911	Sodden.	993	Spar.	76000	Sprunt.
830	Slapjack.	912	Sofa.	994	Sparge.	77000	Spume.
831	Slashed.	913	Soften.	995	Spark.	78000	Spunky.
832	Slater.	914	Soggy.	996	Sparkle.	79000	Spurious.
833	Slattern.	915	Sojourn.	997	Sparling.	80000	Spurling.
834	Slave.	916	Solace.	998	Sparoid.	81000	Spurn.
835	Slavic.	917	Solar.	999	Sparrow.	82000	Spurred.
836	Slayer.	918	Soldier.	1000	Spartan.	83000	Spurtle.
837	Sledge.	919	Solemn,	2000	Sparth.	84000	Sputter.
838	Sleeky.	920	Solert.	3000	Sparve.	85000	Squab.
839	Sleeper.	921	Solidate.	4000	Spasm.	86000	Squabble.
840	Sleet.	922	Solitude.	5000	Spastic.	87000	Squadron.
841	Sleigh.	923	Soloist.	6000	Spate.	88000	Squail.
842			Coloria.		Contbal	89000	Squan.
843	Slender. Sleuth.	924 925	Solstice. Soluble.	7000 8000	Spathal.	90000	Squally.
844					Spathic.		Squalor.
845	Slibber.	926	Solution.	9000	Spatial.	91000 92000	Squamate.
846	Slicer.	927	Solvent.	10000	Spatter.		Squamoid.
847	Slicken.	928	Somal.	11000	Spatula.	93000	Squander.
	Sling.	929	Somatic.	12000	Spavin.	94000	Squash.
848 849	Slipknot.	930	Sombre.	13000	Spawl.	95000	Squatter.
850	Slipper.	931	Sombrous.	14000	Spear.	96000	Squaw.
	Sliver.	932	Somnial.	15000	Specious.	97000	Squeak.
851	Sloam.	933	Sonance.	16000	Speckle.	98000	Squeamish.
852	Slogan.	934	Songster.	17000	Spectacle.	99000	Squeeze.
853	Sloop.	935	Sonnet.	18000	Spectator.	100000	Squelch.
854	Sloping.	936	Sontag.	19000	Spectatrix.	101000	Squib.
855	Slothtul.	937	Soothe.	20000	Spectral,	102000	Squiggle.
856	Slouch.	938	Sooty.	21000	Specular,	103000	Squilla.
857	Slough.	939	Sophic.	22000	Spelding.	104000	Squinch,
858	Sloven.	940	Sophism.	23000	Spelkin.	105000	Squint.
859	Sluggard,	941	Sopite.	24000	Spelter.	106000	Squire.
860	Sluggish.	942	Soprano.	25000	Spelunc.	107000	Squirm.
861	Sluice.	943	Sorbate.	26000	Spender.	108000	Squirrel.
862	Slumber.	944	Sorbet.	27000	Sperge.	109000	Squirt.
863	Smack.	945	Sorcery.	28000	Sperling,	110000	Stabat.
864	Smartly.	946	Sordid.	29000	Spicate.	111000	Stabber.
865	Smatter,	947	Sordint.	30000	Spicy.	112000	Stabling.
866	Smear.	948	Sorel.	31000	Spicknel.	113000	Staccato.
867	Smectite.	949	Sorex.	32000	Spicula.	114000	Staddle.
868	Smelt.	950	Sorghum.	33000	Spider.	115000	Stadinm.
869	Smerlin.	951	Sorgo.	34000	Spight.	116000	Staging.
870	Smilax.	952	Sorrage	35000	Spignet.	117000	Stagger.
871	Smirch.	953	Sorrow.	36000	Spigot.	118000	Stagnant.
872	Smirk.	954	Sortie.	37000	Spiked.	119000	Staidly.
873	Smite.	955	Sorter.	38000	Spikelet.	120000	Stainless.
874	Smithy.	956	Sortition.	39000	Spikenard.	121000	Stairway.
875	Smitten.	957	Sorus.	40000	Spile,	122000	Stale.
876	Smock.	958	Sotadic,	41000	Spinach,	123000	Stalder.
877	Smoky.	959	Sothic.	42000	Spindle.	124000	Stalk.
878	Smoulder.	960	Sotted.	43000	Spinal.	125000	Stalled.
879	Smother.	961	Sotted.	44000	Spinet.	126000	Stallion.
880		962	Soubrette,	45000	Spinner.	127000	Stalwart.
881	Smudge.	963	Souffle.	46000	Spinner. Spinous.	128000	Stanwart. Stamen.
882	Smuggle.			47000	Spiral.	129000	Stamina.
883	Smutch, Snack,	964	Sough. Soughing.	48000	Spirit.	130000	Stamma.
			Soughing.	49000	Spirite.	131000	Stammer.
884 885	Snaffle.	966 967	Sounder.	50000	Spirtle, Spiteful,	132000	Stampede.
886 886	Snaggy. Snail.	967		51000	Spleen,	133000	Stampede. Stanchion.
887	Snail. Snake.	969	Soundly.	52000	Splender	134000	Standish.
031	make.	11 202	Soup.	1) 02000	Splendor.	104000	Standish.

NUMERICAL CODE.—(Continued.)

35000	Stanhope.	182000	Stipple.	229000	Stroller.	276000	Suffer.
36000	Stannel.	183000	Stipular.	230000	Stroma.	277000	Suffix.
37000	Stannite.	184000	Stirrup.	231000	Strombus.	278000	Suffrage.
38000	Stanza.	185000	Stitch,	232000	Strontia.	279000	Suffuse.
39000	Starry,	186000	Stiver.	233000	Strontic,	280000	Sugar,
40000	Starchy.	187000	Stoat.	234000	Strophe.	281000	Suicism.
41000	Stark.	188000	Stockade.	235000	Struggle.	282000	Sulky,
42000	Starling.	189000	Stocking.	236000	Struntain.	283000	Sully.
43000		190000	Stoic.	237000	Strychnose.	284000	Sultan.
44000	Startle.	191000	Stoicism.	238000	Stubble.	285000	Sultanic.
45000	Starve.	192000	Stoker.	239000	Stubbora.	286000	Sumac.
46000	Statal.	193000	Stolid.	240000	Stucco.	287000	Sumbul,
47000	Statant.	194000	Stolon.	241000	Studding.	288000	Summit.
48000	Stately.	195000	Stomatic.	242000	Student.	289000	Summon.
49000	Static.	196000	Storax.	243000	Studio.	290000	Sumpter,
50000	Statuary.	197000	Stork.	244000	Stumble.	291000	Sunder.
51000	Statue.	198000	Straddle.	245000	Stumpage.	292000	Sunken,
	Stature.	199000	Straggle.		Stunner.		Sunny.
52000	Staunch.		Strainer.	246000	Stupefy.	293000	Sunshine,
53000		200000	Strand.	247000	Stupid.	294000	Superb.
54000	Stave. Steak.	201000		248000		295000	
55000		202000	Stranger.	249000	Stupor.	296000	Supine.
56000	Steal.	203000	Strangle.	250000	Sturdy.	297000	Suppage.
57000	Stealthy,	204000	Strapper.	251000	Sturgeon.	298000	Supper.
58000	Steeple.	205000	Strapple.	252000	Stutter.	299000	Supplant.
59000	Steering.	206000	Strass.	253000	Stygian.	300000	Supple.
60000	Stellar.	207000	Stratagem.	254000	Stylish.	301000	Suppliant.
61000	Stellate.	208000	Strategy.	255000	Stylite.	302000	Supreme,
62000 -		209000	Stratify.	256000	Stylus.	303000	Surbate.
63000	Stemple.	210000	Stratum,		Styptic.	304000	Surcease.
64000	Stencil.	211000	Straught.	258000	Styrax.	305000	Surcoat.
65000	Stentor.	212000	Streaky.	259000	Suasive.	306000	Surdal.
66000	Steppe.	213000	Streamlet.	260000	Subdue.	307000	Surfeit.
67000	Sterile.	214000	Strengest.	261000	Sublate.	308000	Surfy.
68000	Sterlet.	215000	Strepent.	262000	Sublime.	309000	Surgent.
69000	Sternite.	216000	Stretcher.	263000	Suborn.	310000	Surgical.
70000	Steward.	217000	Striate,	264000	Subsist.	315000	Surmise.
71000	Sticker.	218000	Strickle.	265000	Subsoil.	320000	Surmount.
72000	Stickle.	219000	Stricture,	266000	Subtile.	325000	Surname.
73000	Stifle.	220000	Stride.	267000	Suburb.	350000	Surplice.
74000	Stigma.	221000	Strident.	268000	Subvene,	375000	Surrey.
75000	Stiletto.	222000	Strigate,	269000	Subvert.	400000	Surtout.
76000	Stillage.	223000	Striker.	270000	Succinct.	500000	Survey.
77000	Stilted.	224000	Stringy.	271000	Succor.	690000	Survive.
78000	Stimulus.	225000	Stripling.	272000	Succumb.	700000	Suspire.
79000	Stinger.	226000	Stroam.	273000	Sucker.	800000	Sutler.
80000	Stinger.	227000	Strobile.	274000	Sudary.	900000	Suture.
00000	Stipend.	228000	Strockle.	21-1000	Duday.	200000	Sutule.

INDEX.

GENERAL INFORMATION.	PAGE.								
Announcement,	5								
Cipher Code,	322								
Classification of Locomotives,									
Compound Locomotives,									
Hauling Capacity of Locomotives,	290								
History of Works,	9								
Locomotives (United States), description and illustration of,	32 - 219								
Locomotives (Foreign), description and illustration of,	220 - 287								
Plant, extent and capacity,									
Piston Valves, information relating to,									
Specification, form of,									
Tables, explanation of,									
Table No. 1.—Tractive Power of Locomotives,	291-315								
" No. 2.— Piston Travel per Engine Mile,	316								
" No. 3. — Mean Available Pressures at Different Piston Speeds,									
and Boiler Pressures,	317								
" No. 4.— Revolutions of Driving Wheels per Mile,	317								
" No. 5. — Train Resistance in Pounds per Ton,	318								
" No. 6.— Resistance of Curves,	318								
" No. 7.—Speed in Miles per Hour,	319								
" No. 8.— Mean Effective Pressures,	320								
" No. 9.— Mean Available Pressures,	321								
"A.—Compound Cylinders, sizes of,	22								
"B.—Comparison of 2 Cylinder Compounds,	23								
"C.—Comparison of 4 Cylinder Compounds,	24								
Tests of Material, Physical and Chemical,	30								
a control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the control of the cont									
CLASSES OF LOCOMOTIVES Illustrated and Described									
CLASSES OF LOCOMOTIVES, Illustrated and Described.									
UNITED STATES.									
8-Wheeled,	32 - 55								
Mogul,	56- 83								
Consolidation,	84-113								
10-Wheeled,	114 -159								
12-Wheeled,	160-175								
6-Wheeled Switcher,	176-197								
6-Wheeled Saddle Tank Switcher,	198-199								
4-Wheeled Switcher,	200 - 205								
4 Wheeled Saddle Tank Switcher,	206-213								
4-Coupled "Forney" Tank,	216-217								
6-Coupled Double Ender Tank,	214 215								
4-Coupled Double Ender Tank,	218-219								
2 - Output									
FOREIGN.									
8-Wheeled,	220-229								
Mogul,	230-237								

Consolidation,	
Consolidation, Double Ender,	247
10-Wheeled,	251
12-Wheeled,	
6-Wheeled, Switcher,	255
4-Wheeled Saddle Tank,	257
6-Coupled Double Ender Tank,	267
6-Coupled Tank,	271
6-Wheeled Tank.	275
4-Coupled Double Ender Tank,	281
4-Coupled Double Ender Saddle Tank,	283
4-Wheeled Tank,	
,	
RAILROADS REPRESENTED.	
UNITED STATES.	
American Wire Company, 4-Wheeled Switcher,	209
	217
	177
	$\frac{107}{107}$
, , , , , , , , , , , , , , , , , , , ,	145
· · · · · · · · · · · · · · · · · · ·	149
	173
	189
	67
	$\frac{67}{207}$
	207 205
	$\frac{205}{167}$
	$\frac{107}{143}$
Cleveland, Cincinnati, Chicago & St. Louis R'y, 10-Wheeled,	$\frac{145}{187}$
o-wheeled switcher,	
Chicago, Indianapolis & Louisville Railway, . 8-Wheeled,	33
. 12-Wheeled,	171
. o wheeled Switcher,	185
	215
· - 1	219
7/	139
	211
Cincinnati, Hamilton & Dayton Railroad, 8-Wheeled,	39
,,	79
* " Consolidation,	111
* " " " " " " " " " " " " " " " " " " "	113
Congress Gold Company, 6-Wheeled Switcher,	197
Delaware, Lackawanna & Western Railroad, . 12-Wheeled,	165
Denver & Rio Grande Railroad, 10-Wheeled,	115
Duluth, Mississippi River & Northern Railroad, Mogul,	69
" " " 10-Wheeled,	147
	87
	131
Flint & Pere Marquette Railway, Mogul,	65
* Indicates narrow gauge.	

FOREIGN. — (Continued.)

Page.

		U	NITED	STA	TE!	S. —	-(Continued.)		Page.
Florida	Southern	n Railroa	d				. 8-Wheeled,		53
	Northern						Mogul,	٠	59
66	64	44			•				105
6.6	4.6	6.6			•		40 ****	٠, ۰	119
6.6	6.6	6.6	• • •		•				137
6 6	6.6	6.6		•	•		. 12-Wheeled,	•	163
6.6	6.6	6.6	• • •	•	•			•	175
6.6	* *	6.6		• •	•		. 6-Wheeled Switcher		179
Illinois	Central	Railroad	• •		•	•	. 8-Wheeled,		37
44	66	44		•	•		. 10-Wheeled,		127
6.6	6.6	6.6		•			12-Wheeled.	,	161
6.6	6.6	6.6			•		. 6-Wheeled Switcher, .		4.00
Indiana		is Southe	rn Pailro	ođ	•		. 10-Wheeled,		153
	Railroad,			,	٠		,		$\frac{199}{75}$
	,				•		. Mogul,		
									·
		stern Rai					, .		4.00
Lake S	nore & M	Iichigan S	outnern	Kam	vay,		. 8-Wheeled,	٠	
		66	"	"		,*	. Consolidation,		93
4.6	44	"	"			•	. 10-Wheeled,		
6.6	4.4		"			•	· Compound,	٠	123
			"	6.6		•	• • • • •	•	
		• •	• •	• • •		•	• • • • •	•	
6.6	66	6 6	6.6	6.6				٠	159
6.6	66	66	6.6	6.6			. 6-Wheeled Switcher, .		. 181
	sland Rai	,				•	. 8-Wheeled,		43
6.6		٠.					. Consolidation,		
6.6		٠.			٠		. 10-Wheeled,		117
		shville Ra					. Consolidation,		91
		Paul & .			oad,	,	. Consolidation, Logging,		
		s & Texa					. Mogul,		63
	ng Railw						. Mogul,		. 73
		ral & Hi					l, Mogul,		. 61
		cago & St					. Mogul,		. 71
		Coast Ra	ilroad,				. 8-Wheeled,		55
Ohio F	River Rai!	road,					. 10-Wheeled,		155
		l & Navig	,				. Consolidation,		
	-	Northeas					. 8-Wheeled,		. 45
	6.6	6.6							. 51
Peoria	& Pekin	Union Ra	ailway,				. 6-Wheeled Switcher,		. 193
	0 /	semer & I				ν,	. Mogul,		. 57
6.6	4	6		6	6		. Consolidation,		. 85
Presco	tt & East	ern Railw	ay, .				. 10-Wheeled,		. 141
* Quin	cy & Tor	ch Lake	Railway,				. Mogul,		. 77
* Siski	wit & Sou	ithern Ra	ilroad,				. Mogul,		. 81
Southe	ern Railw	ay, .					. Consolidation,		. 97
		ompany,					. 4-Wheeled Switcher,		. 201
St. Jos	seph & Gr	rand Islar	nd Railro	ad,			. Consolidation,		. 103
St. La		Adironda	ack Raily	vay,			. 8-Wheeled,		. 35
6.6	66	6.6	6.6				. 10-Wheeled,	,	. 129
St. Lo	uis Natio	nal Stock	Yards,				. 6-Wheeled Switcher,		. 195

^{*} Indicates narrow gauge.

UNITED STATES.—(Continued.)						
St. Mary's & South-Western Railroad, . Consolidation,	Page, 95					
Studebaker Bros. Mfg. Co., 4-Wheeled Saddle Tank Switcher,	211					
*Tionesta Valley Railway, Mogul,	83					
Tonawanda Iron & Steel Company, 4-Wheeled Saddle Tank Switcher,	203					
Ulster & Delaware Railroad, 6-Wheeled Saddle Tank Switcher,						
Union Pacific Railroad, 8-Wheeled,	41					
	99					
· · · · · · · · · · · · · · · · · · ·	$\frac{33}{125}$					
The Price Print 1	169					
Washington County Railroad, 8-Wheeled,	47					
	151					
Wisconsin Central Railroad, 10-Wheeled,	135					
* Indicates narrow gauge.						
FOREIGN.						
	240					
American Railroad & Lumber Co. of Mexico, Consolidation,	243					
Bisai Railway of Japan, 4-Coupled Double Ender Tank,	281					
Canadian Copper Company, 6-Wheeled Switcher,						
Central Railway of Brazil, 8-Wheeled,						
" " 12-Wheeled,	253					
" " 6-Coupled Double Ender Tank,						
Chihuahua & Pacific Railroad of Mexico, . 8-Wheeled,	221					
" " " Consolidation,	241					
Hankaku Railway of Japan, 8-Wheeled, . '	229					
" " 6-Coupled Double Ender Tank,	263					
Imperial Government Railways of Japan, . 8-Wheeled,	223					
Jalapa & Cordova Railway of Mexico, Mogul,	235					
Kansei Railway of Japan, Mogul,	233					
Kiushiu Railway of Japan, 6-Coupled Tank,	269					
Kiwa Railway of Japan, 4-Coupled Double Ender Tank,	279					
Kobu Railway of Japan, 6-Coupled Double Ender Tank,						
Koya Railway of Japan, 6-Coupled Double Ender Tank,						
Lovisa-Wesijarvi Railway of Finland, Mogul,	237					
	245					
Mexican Central Railway, Mogul,	231					
• • • • • • • • • • • • • • • • • • • •						
· · · · · · · · · · · · · · · · · · ·						
Consolidation, Double Ender,	247					
· · · · · · · · · · · · · · · · · · ·						
Mexico, Cuernavaca & Pacific Railway, 10-Wheeled,	251					
Nanyo Railway of Japan, 4-Wheeled Tank,	285					
Nanwa Railway of Japan, 6-Coupled Double Ender Tank,	261					
Santa Maria Magdalena Railroad of Brazil, . 4-Coupled Double Ender Sad-						
dle Tank,	283					
Sanuki Railway of Japan, 6-Wheeled Tank,	275					
Seiwa Railway of Japan, 6-Wheeled Tank,	273					
Seoul-Chemulpo Railroad of Korea, 6-Coupled Tank,	271					
Sung-Wu Railway of China, 4-Coupled Double Ender Tank,	277					
Transvaal & Delagoa Bay Collieries, 4-Wheeled Switcher,	257					
Vanegas, Cedral & Rio Verde R. R. of Mexico, 8-Wheeled,	225					
Note. — Foreign engines are various gauges. See description.						









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