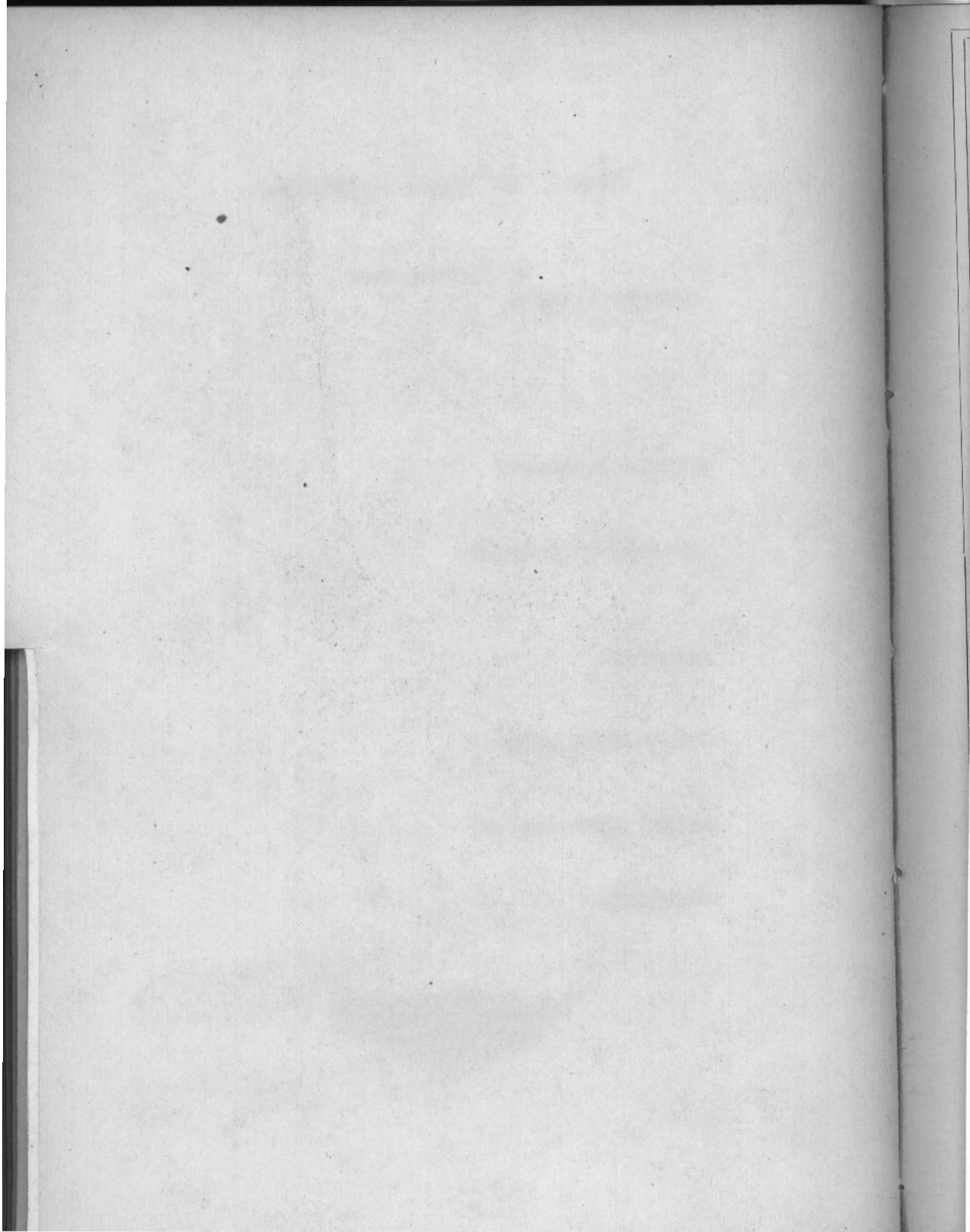
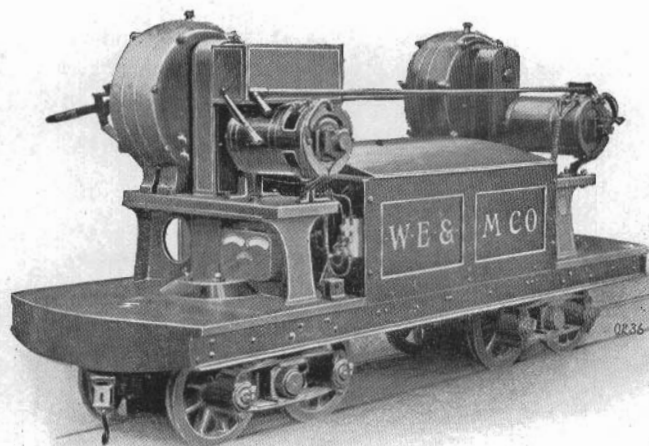


HARRY HILDEBRAND, General Superintendent.



ELECTRIC
STORAGE BATTERY
LOCOMOTIVE



Narrow Gauge Electric Locomotive.

C. W. HUNT COMPANY

WEST NEW BRIGHTON, STATEN ISLAND, N. Y.

NEW YORK CITY OFFICE
45 BROADWAY

PITTSBURG OFFICE
515 PENN AVENUE

Copyright, 1903, by C. W. Hunt Company, New York

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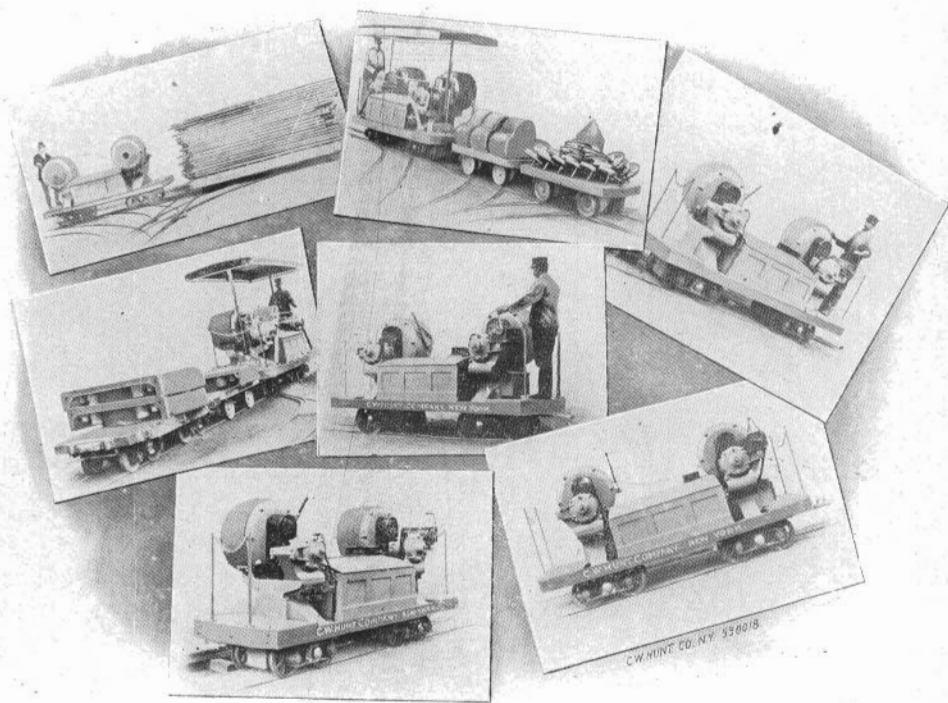
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ELECTRIC LOCOMOTIVES



Electric Locomotives

STORAGE BATTERY LOCOMOTIVE

Storage Battery Locomotives. A Storage Battery Locomotive is the ideal motive power in shops, foundries, and manufactories where heavy material is to be moved on cars.

Advantages. Ready to use, day or night.

No fire risks, and the insurance rates are not affected.

No trolley wires to maintain, or to interfere with overhead cranes or belts.

No electrolysis of water and car pipes from return currents.

Reaches any part of the works where 12 feet radius curves can be laid.

Cheaper to operate and maintain than a span of horses.

Simplicity itself.

The machinery is above the platform of the car.

The batteries require no attention from morning till night.

Batteries are as easily examined as though on a table before the inspector.

An ample range of working speeds for shop and yard work.

Motors are ironclad and the gearing is inclosed in an oil-tight case.

Less technical skill is needed than there is with horses, steam, or gasoline.

Double ended platform, with ample room for the driver.

No expense on Sundays, holidays, or when work is slack.

Does not require a licensed engineer.

Does not request shorter hours, higher pay, or join a sympathetic strike.

No expensive conduits underground.

The narrow gauge size runs with perfect freedom around curves of 12 feet radius, and with it one man can handle the material of an ordinary manufacturing establishment. As it runs smoothly around curves of 12 feet radius, any part of the works can be reached, a matter of the highest value in manufactories with irregularly placed buildings.

There are two varieties of storage battery locomotives made by this company, each one having its own field of usefulness.

Standard Gauge. This locomotive is adapted to switching two or more ordinary freight cars at a time in and around manufacturing companies' works and yards.

Narrow Gauge. This size is especially adapted to run on curves of 12 feet radius, with a 21 $\frac{1}{2}$ -inch gauge, and is used in buildings and the yards of manufactories. The short radius curves enable the tracks to reach every part of the works. As no trolley wires are required the locomotive can reach any part of the yards, either on permanent or temporary tracks. It hauls several loaded shop cars to any part of the works, and up the grades frequently found in establishments that grow by successive additions.

ELECTRIC LOCOMOTIVES

Duplication. They are driven by two independent motors taking current from a storage battery. All the wheels are driven, and have power enough behind them to ascend the steepest practical grades, or giving a draw-bar pull up to the point of slipping the driving wheels.

The Energy. The energy required for its daily work is furnished by a storage battery, which is charged at night or at intervals during the day when the locomotive is idle. In many situations the locomotive will have various intermissions in its work that can be utilized for charging, and the batteries can be kept fully charged without charging at night. The daily recharging of the batteries requires about one-quarter as much time as the locomotive has been in active work during the day.

Cost of Operation. If the locomotive is not at work, no power is used or wasted. If it is at work, only the power needed to do the work is taken. One man handles the locomotive, and usually does the coupling, and in yard work lends a hand in loading or unloading the cars. The actual amount of power consumed depends on the kind and amount of work to be done daily. Generally speaking, the current will cost about 50 cents per day of ten hours for the 4 to 6-ton shop locomotive herein described, and up to \$1.50 per day for the 16-ton standard gauge locomotive.

The Batteries. The current from the battery is utilized by various combinations of series-parallel connections, thus obtaining the different variations of draw-bar pull and speed required for general shop work. Unusually large and heavy battery plates are used, which are not overworked even in starting the load, thus insuring a durability and efficiency of the lead plates equal to that found in batteries used in electric lighting station work.

The generous proportions of our storage batteries will be appreciated by considering that batteries for automobile work are usually required to deliver about 7 watts per pound of lead, while our batteries are called upon for only 2 watts per pound. The battery cells are not sealed, but are covered with a loose rubber plate to keep out dust and to lessen the evaporation of the electrolyte. Each cell can be fully inspected by raising the cover.

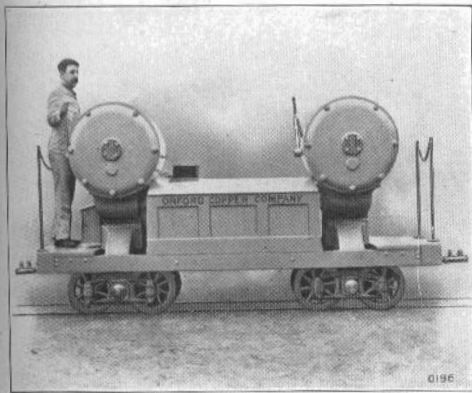
Rheostats. There are no rheostats or resistances of any kind, thus avoiding all waste of electric energy either in starting or in running. The motors are so exactly proportioned to the normal output of the batteries, and to the weight of the locomotive, that they are not and cannot be overloaded by the driver, but with normal loads operate at maximum efficiency, and consequently they remain thoroughly durable and highly efficient in regular service.

Motors. Two independent electric motors are used, connected at will, either in series or in parallel, which at low speeds give a great starting effort with a minimum consumption of electric current—an object

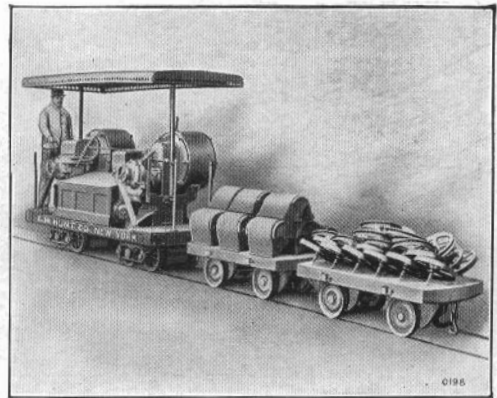
especially desirable with storage batteries, as they can be charged with only a limited amount of energy. It is evident that any increase in the efficiency of either the motors or the mechanism is equivalent to increasing the life of the batteries and the radius of action of the locomotive. These motors possess the valuable quality of pulling the hardest when the load is being started and the speed is the slowest, and lessening their pull as the speed of the car is accelerated.

Should one motor require examination or repair the other would do all ordinary yard work, although only one truck would be driving.

Draw-Bar Pull. The locomotives are so designed that every wheel is a driver, and are usually geared so that the motors have power to



No. 0196



No. 0198

slip the wheels on the track, thus enabling the locomotive to ascend the heaviest grade used on railways. It is the usual custom to estimate the draw-bar pull of locomotives as one-fifth of the weight on the drivers, but in practical work on tracks that are liable to be wet or greasy, as may be expected in workshops, the driving wheels will slip before that draw-bar pull is reached. Sanding the tracks will be necessary under such conditions.

Grades. A difference of level in the floor of workshops is a fruitful source of expense when articles are moved by hand. This disadvantage, however, disappears with the locomotive, as it takes its load up all grades required in reaching any part of the works.

SHOP SIZE LOCOMOTIVE

| | | | |
|-------------------------|---------|---------------|---------|
| Hauls on the level..... | 50 tons | 3% grade..... | 10 tons |
| 1% grade..... | 25 tons | 4% grade..... | 7 tons |
| 2% grade..... | 15 tons | 5% grade..... | 5 tons |

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ELECTRIC LOCOMOTIVES

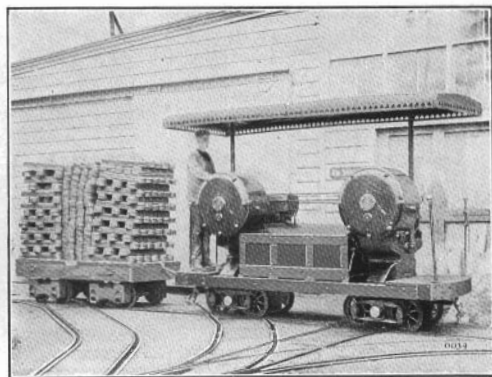
Dust Proof. We do not mount the electric motors between the wheels, as is the practice in street railway cars, because the space is extremely small, and all the room below the platform would be filled with motors, gears, and wire connections, so that proper inspection, care, or securing suitable room for getting at the parts, would be impossible. It would also bring the motors and gears down so close to the track that the machinery could not be protected from dust or mud. In our locomotive the driving mechanism is entirely enclosed, so that it could run through six inches of water without wetting any working part.

Gearing. All the gear wheels have machine-cut teeth, and are mounted on steel shafts, ground true on dead centers and running in



No. 0033

A Three-Ton Load on a Two Per Cent. Grade.



No. 0034

A Five-Ton Load on a Five Per Cent. Grade.

bearings with removable bushings. All the gearing, shafts, and bearings are enclosed in an oil-tight circular case, which excludes rain and dust, keeps the bearings in perfect alignment, and permits the gear wheels to run in a bath of lubricating oil. These are ideal conditions for durability and the reduction of friction losses.

Curves. The narrow gauge used in shop tracks carries with it as a corollary short radius curves. Our standard gauge is $21\frac{1}{2}$ inches from out to out of rail head, and the curves are 12 feet radius, around which the locomotive runs freely. We are not limited to this standard gauge, and build locomotives for other narrow gauges, as well as for the standard 4 feet $8\frac{1}{2}$ inches gauge.

Battery vs. Trolley. In almost every case the first cost of the battery for supplying the energy to the locomotive is less than the cost of trolley wires and supports, including the cost of erecting them in position, and the expense for maintenance is far less than for trolley wires. The battery locomotive can instantly run on any track, regular or improvised,

L. W. HUNT COMPANY, NEW YORK

ELECTRIC LOCOMOTIVE DATA SHEET

In making inquiries the following blanks should be filled out and forwarded to the C. W. Hunt Company, West New Brighton, New York.

Gauge of the track.....
Length of the track.....
Number of curves in the track.....
Radius of the shortest curve.....
Number of grades in the road.....
Feet raise per 100 ft. in each grade.....
Longest grade in feet.....
Is it with or against the loads.....
Kind of material to be handled.....
Load per car.....
Number of cars per train.....
Number of trips per day.....
Number of working hours in a day.....
Distance the loads are to be hauled.....
Weight of a car, loaded.....
Weight of a car, empty.....
Is the work continuous or intermittent.....
Do you require an independent charging set.....
Have you an electrical supply.....
If so, state the voltage of direct current.....
Is it perfectly steady or fluctuating.....
What variations in voltage occur.....
If alternating, state voltage.....
Phase..... Cycles.....
What make of electric generator.....
Is your current available at night.....
Is it at noon times.....
Have you steam available.....
What is the pressure at night.....
What at noon time.....

Name.....

Address.....

Great care should be taken in filling out this sheet. Should the data be under or over stated, our reply will not be satisfactory, as it must be based on the data furnished. If there are items that are uncertain or approximate, the fact should be mentioned.

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ELECTRIC LOCOMOTIVE DATA SHEET

Name _____

Address _____

City _____

State _____

Zip _____

Number of cars per train _____

Number of wires per car _____

Number of work hours per day _____

Distance the loads are to be hauled _____

Weight of load _____

Height of load _____

Is the work intermittent? _____

Do you require an interlocking device? _____

Is your interlocking equipment _____

Does your system require direct current? _____

Is it perfectly ready for installation? _____

What voltage is available? _____

Is alternating this voltage? _____

Phase _____

What make of electric motor? _____

Is your current available at night? _____

Is it at noon times? _____

Do you require a transformer? _____

Do you require a switch? _____

What is the pressure at night? _____

What is your time? _____

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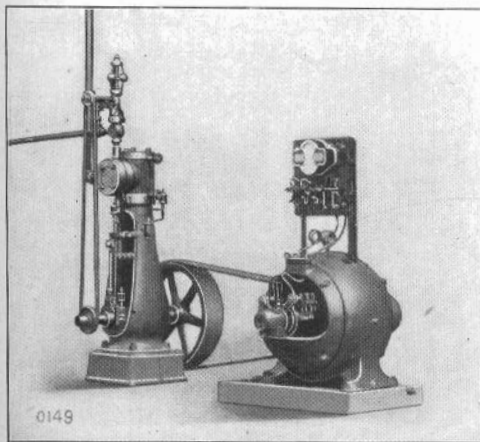


while the trolley locomotive can run only where wires are installed. Trolley wires cannot well be run in erecting shops, machine shops, or under overhead cranes, while the battery locomotive is operative wherever a track is laid.

Convenience. The large platform gives ample space for the driver, and permits an arrangement of the batteries, motors, and gearing above the floor, with every part in plain sight for convenient inspection or adjustment. The batteries are as easily examined as though they were placed on a table before the inspector. The shop locomotive can be controlled with equal facility from either end, as the operating levers at the two ends are connected.

Limitation. The great weight of lead batteries in proportion to the energy they will store precludes the consideration of storage battery locomotives for long hauls or high speeds; but for shop or yard work the increased weight from the batteries is an advantage in giving a great draw-bar pull. On tracks substantially level, or with short grades frequently found in manufacturing establishments, a battery is incomparably the most convenient, economical, and efficient source of power.

Charging. The daily charging of the batteries must be done with a voltage exactly suited to the batteries used. This is usually 110 volts, and the charging current must not vary very materially from that or the results will not be satisfactory. A factory supplying its own current may vary five or ten volts above and below the normal voltage and the result not be noticed on the motor driving ordinary machinery, but the variation would be too great for the batteries; hence we recommend a separate generator driven by an independent steam engine or an electric motor. The current can then be delivered at exactly the correct voltage. This little set can be utilized in many plants to furnish a few lights or other electric service, at a time when the large generators are not running.



Steam Charging Set.

Charging Set. The batteries must be recharged daily to supply the energy for the next day's work. This can be done safely and accurately by an independent steam or electric driven dynamo and its accessories, exactly proportioned in voltage and output to the number and capacity of the cells. This charging set, with ammeter, voltmeter, and switches, must be properly installed with the first locomotive. The same set will, however, charge two or three locomotives of the same size.

ELECTRIC LOCOMOTIVES

Simplicity. Every operation of handling the locomotive, and charging the batteries, is so thoroughly safeguarded and simple that a careful workman without technical knowledge can safely be entrusted with its care, both at work and in charging.

Remember. Storage battery locomotives are suitable only for yard or intermittent work, and not for long hauls or heavy grades. No more energy can be taken out of the battery than has been put into it. Intelligent care in the inspection, maintenance, and use of the locomotive is absolutely essential, and with it the purchaser will have nothing but satisfaction.

Insurance. Our electric locomotive is particularly suitable for use wherever the fire risk is an important consideration. The use of steam locomotives in buildings is, in many cases, prohibited on account of the danger of sparks being emitted. Electric locomotives operated by trolley are also an element of danger, on account of the sparking at the contacts, both at trolley and tracks. This is particularly true where there are many switches, cross-overs, or curves.

None of these objections apply to our electric locomotive, because it is operated by storage battery; consequently there is no fire to throw off sparks, there are no troublesome overhead trolley wires, and no return current to pass from wheel to track. The fire risk is therefore eliminated and correspondingly favorable insurance rates are obtainable.

We furnish these locomotives complete with the special electric generating and charging set. We can send a man to start the locomotive, and to instruct the purchaser in the care, inspection, and charging of the batteries.

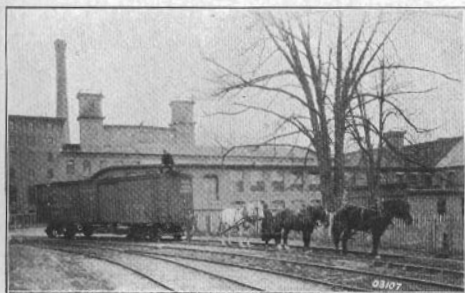
You are cordially invited to visit our works, and not only to see a locomotive at work, but to handle it yourself in doing its regular work, both on level tracks and on five per cent. grades, charge the batteries, and see how smoothly the locomotive sweeps around curves of 12 feet radius.

STORAGE BATTERY LOCOMOTIVES

21½ INCHES GAUGE

| | |
|---|-----------------------|
| Weight of the narrow gauge locomotive..... | 4 to 6 tons |
| Gauge of track outside of rail heads (Hunt Standard). | 21½ inches |
| Length of locomotive, over all | 13 feet |
| Width of locomotive, over all..... | 56 inches |
| Height of locomotive, over all, without canopy..... | 66 inches |
| Height of locomotive, over all, with canopy.. | 100 inches or to suit |
| Height of draw-bar above the rail head..... | 13½ inches |
| Axle bearings..... | Patent Steel Roller |

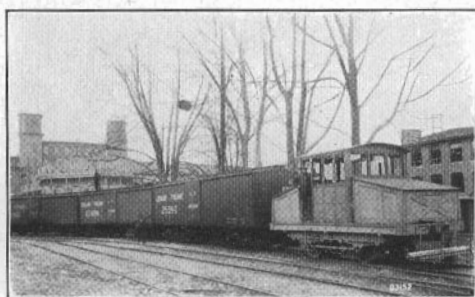
ELECTRIC LOCOMOTIVES.



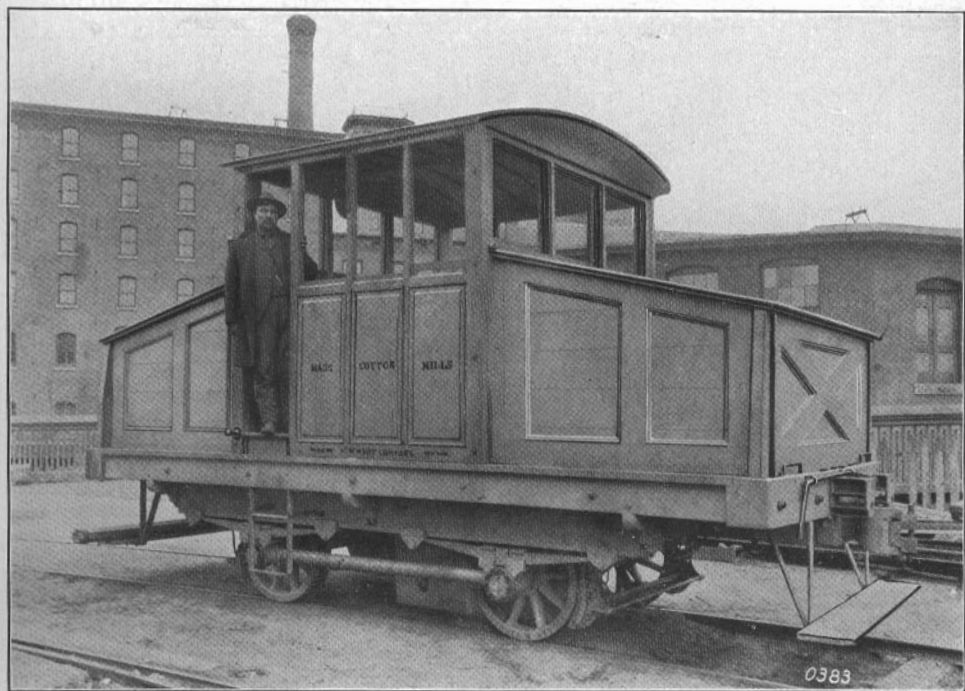
No. 03107.
Moving freight cars with horses.



No. 03109.
An awkward corner.



No. 03152.
Electric locomotive hauling cars (new way).



No. 0383.
20-ton switching electric storage* battery locomotive.

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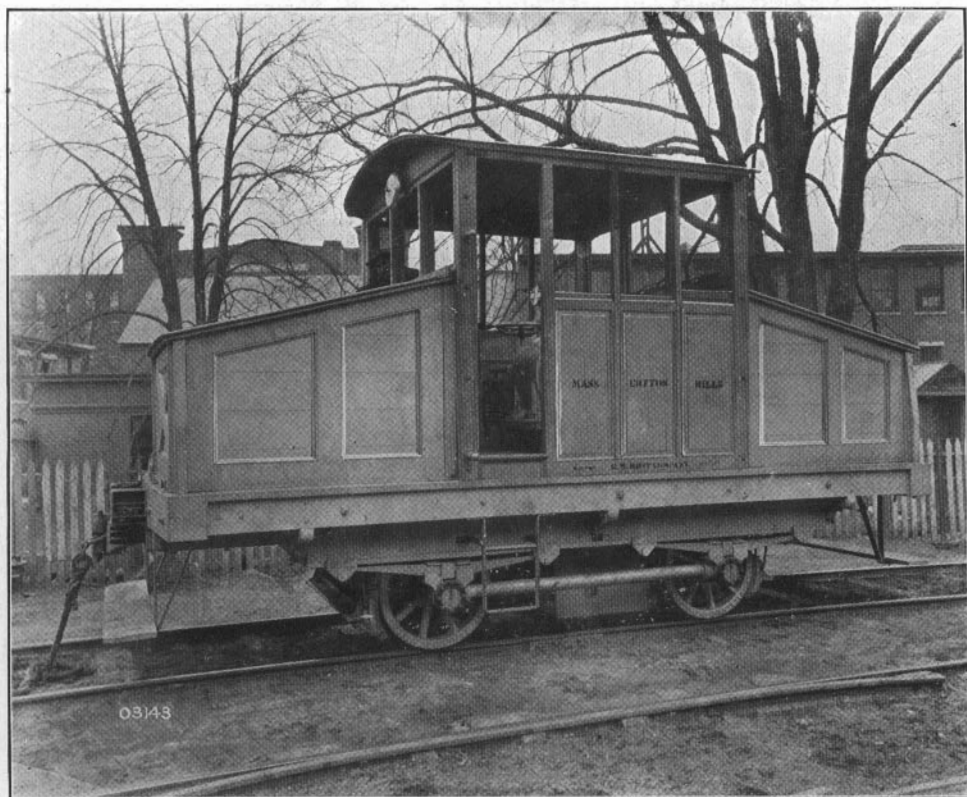
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C. W. HUNT COMPANY, NEW YORK.



No. 03151.
Electric switching locomotive in service.



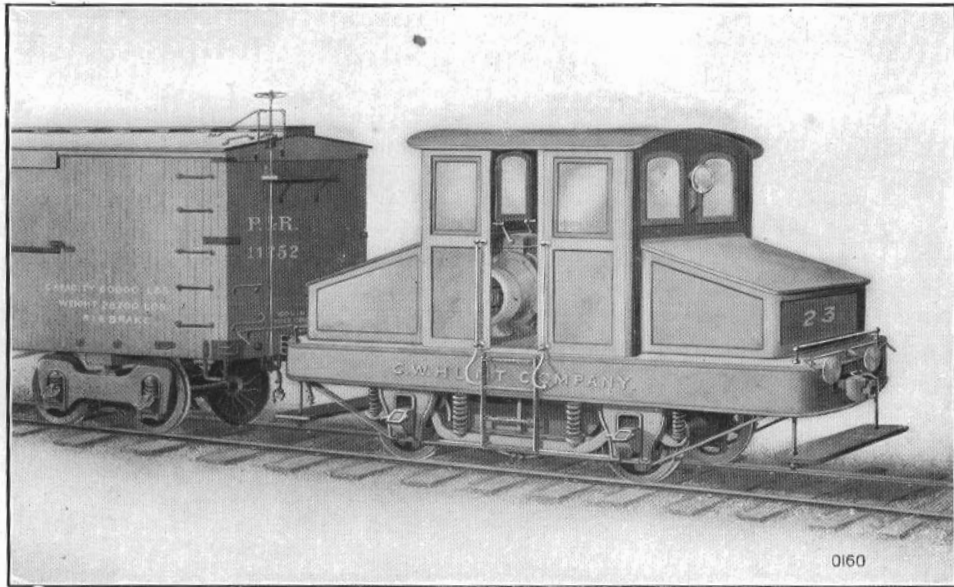
No. 03143.
Hunt standard gauge electric storage battery switching locomotive.

C. W. HUNT COMPANY, NEW YORK

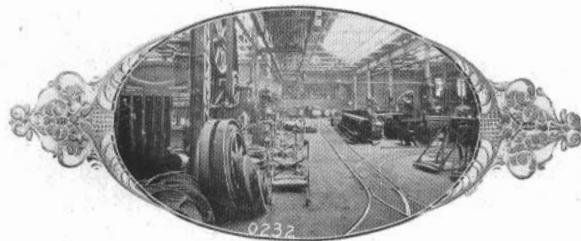
Will run on curves of 12 ft. radius
 Speed per hour, variable from 1 to 4 miles
 Range, in the usual run of shop and yard work 10 hours

STANDARD 4 FEET 8½ INCHES GAUGE

Weight of the locomotive 12 to 20 tons
 Length of the platform 21 to 34 feet
 Gauge of the truck 4 ft. 8½ inches
 Width, over all 8 ft. 7 inches
 Height, over all 12 feet
 Coupler, style Master Car Builder
 Axle bearings Patent Steel Roller
 Speed per hour 2 to 5 miles
 Range in service 10 hours



Standard Gauge Switching Locomotive.



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ELECTRIC LOCOMOTIVES

ELECTRIC LOCOMOTIVE DATA SHEET

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Longest grade in feet.....
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Kind of material to be handled.....
Load per car.....
Number of cars per train.....
Number of trips per day.....
Number of working hours in a day.....
Distance the loads are to be hauled.....
Weight of a car, loaded.....
Weight of a car, empty.....
Is the work continuous or intermittent.....
Do you require an independent charging set.....
Have you an electrical supply.....
If so, state the voltage of direct current.....
Is it perfectly steady or fluctuating.....
What variations in voltage occur.....
If alternating, state voltage.....
Phase..... Cycles.....
What make of electric generator.....
Is your current available at night.....
Is it at noon times.....
Have you steam available.....
What is the pressure at night.....
What at noon time.....

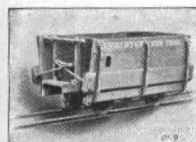
Name.....

Address.....

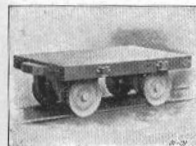
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C. W. HUNT COMPANY, NEW YORK

We build "Industrial" railway tracks, switches, turntables and many varieties of cars to suit every kind of service. A few are illustrated below.



No. 0109
Standard Push Car.



No. 0110
Standard Shop Car.



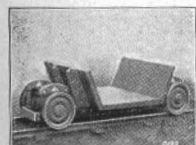
No. 0117
Double Door Charging Car, Consumers' Lt. Ht. & P. Co.



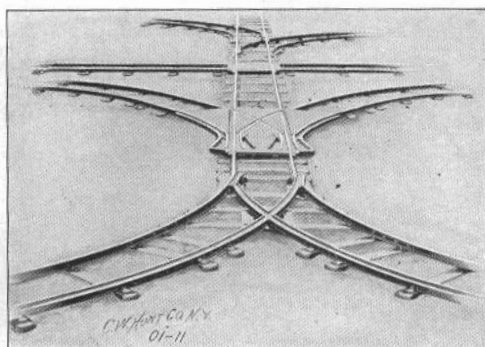
No. 0131
Eight-wheel 10-ton Flat Car, for U. S. Government, at Charleston.



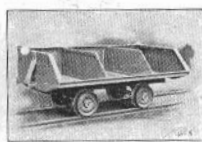
No. 0132
Self-dumping Car, for Equitable Gas Light Company, New York.



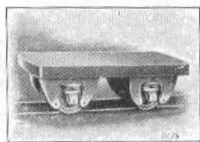
No. 0133
Copper Ingot Car, floor 8½ in. above rails.



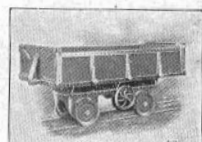
No. 0111
Standard Track.



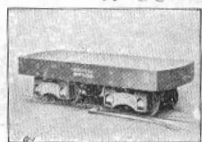
No. 016
Special Three-Ton Scrap-Metal Car, for Coe Brass Co.



No. 0134
Shop Car, with bearings outside of the wheels.



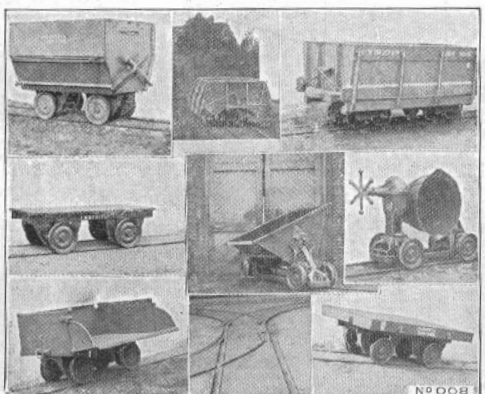
No. 0120
Charging Car, with worm tipping gear.



No. 0111
Standard eight-wheel Shop Car.



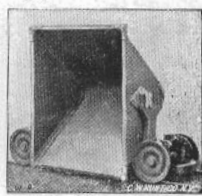
No. 012
Car with elevating top, for the Manhattan Storage Battery Co.



No. 008
Group of Industrial Railway Cars.



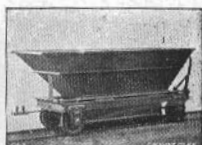
No. 0129
Tip Car, 36 in. gauge, Colorado Coal and Iron Co.



No. 0130
Automatic Dumping Acid Phosphate Car, Morgan & Co., Shady Side, N. J.



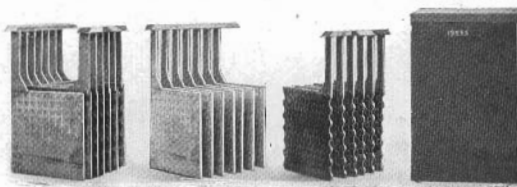
No. 0128
Generators Charging Car, Northern Gas Light Co., N. Y.



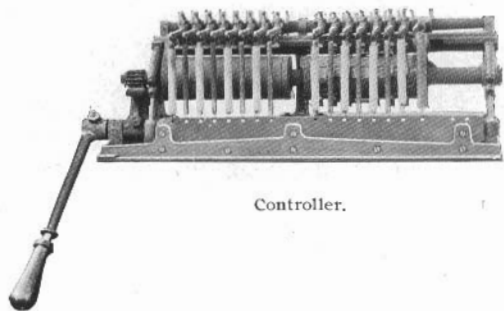
No. 017
Coke Car, Montreal Gas Co.

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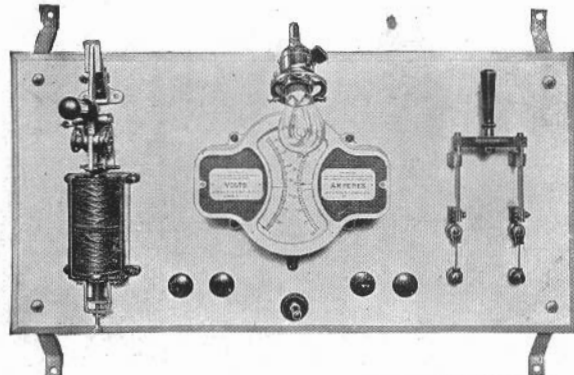
ELECTRIC LOCOMOTIVES



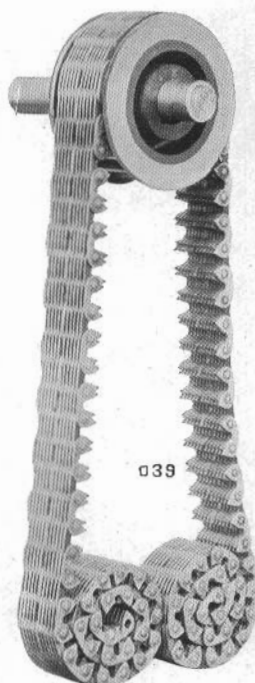
Battery Plates, open and closed, with cell.



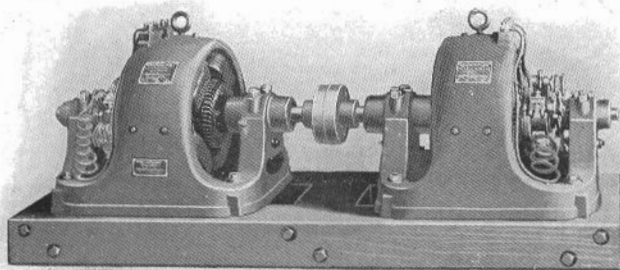
Controller.



Switchboard Panel with Switch Circuit Breaker and Volt Ammeter



Reynolds Chain.



Motor Generating Set.

ELECTRIC LOCOMOTIVE ACCESSORIES.