

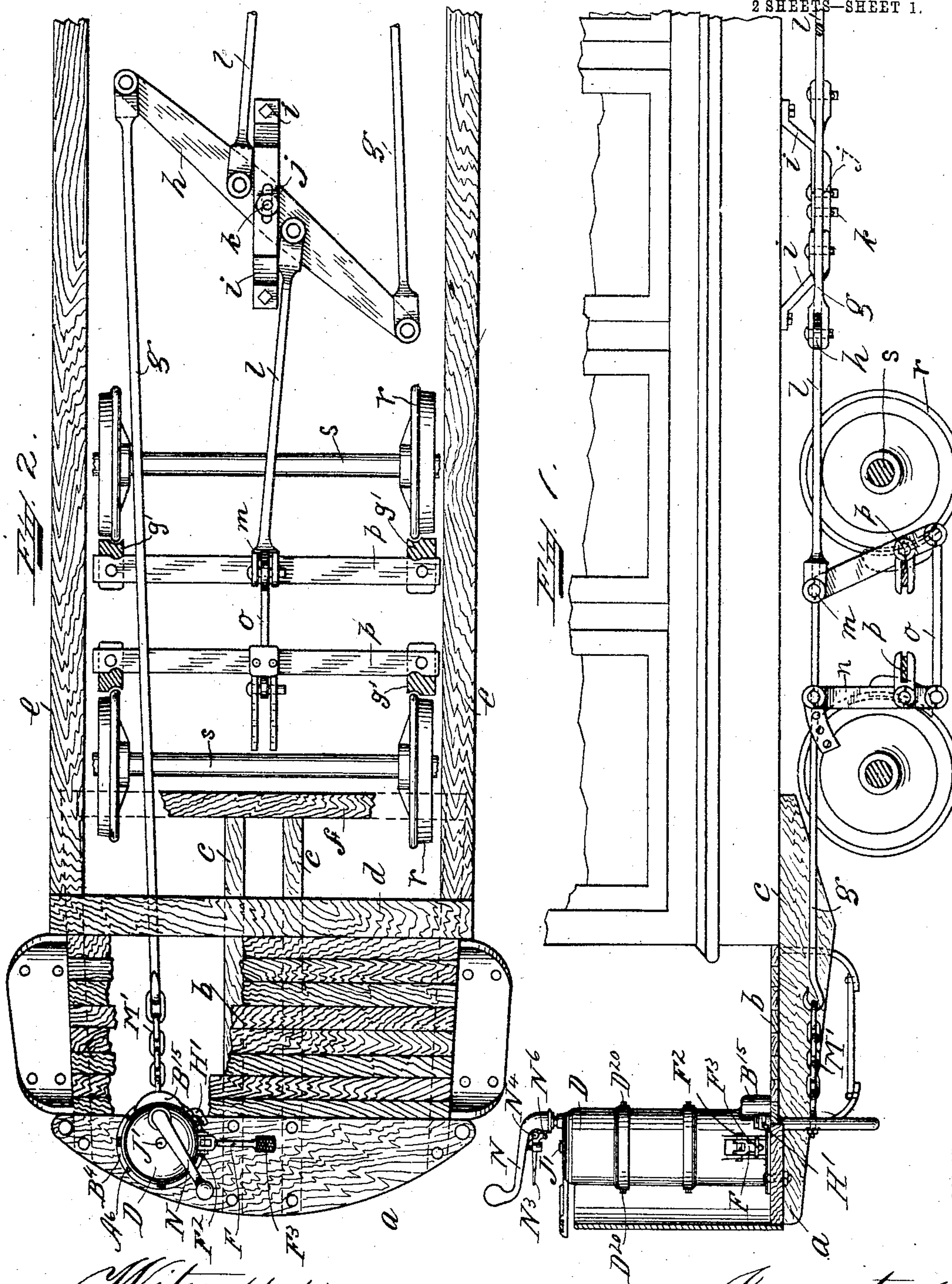
No. 786,379.

PATENTED APR. 4, 1905.

L. PFINGST.
POWER BRAKE.

APPLICATION FILED JULY 13, 1904.

2 SHEETS—SHEET 1.



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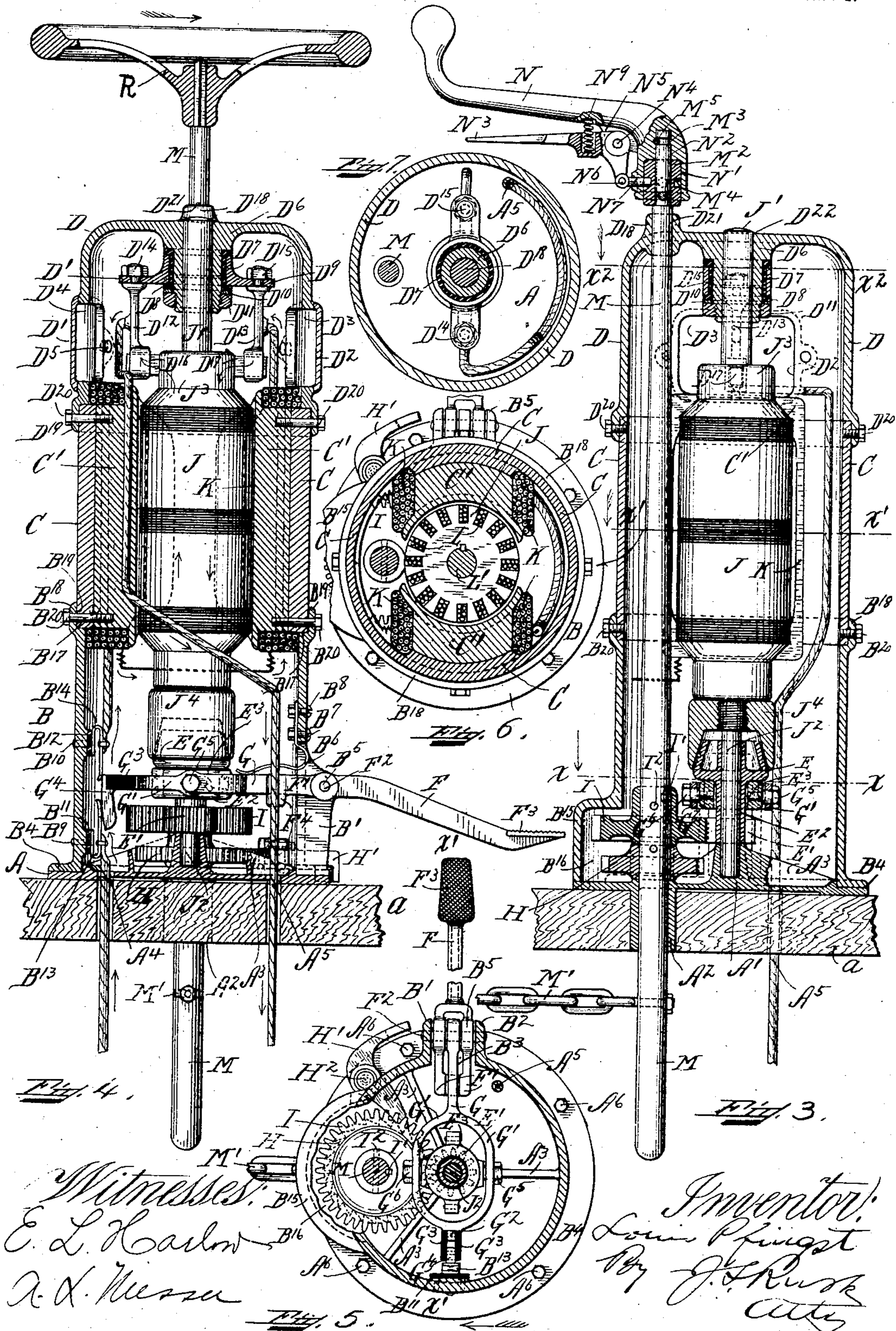
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UNITED STATES PATENT OFFICE.

LOUIS PFINGST, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO PFINGST ELECTRIC MANUFACTURING COMPANY, OF KITTERY, MAINE, A CORPORATION OF MAINE.

POWER-BRAKE.

SPECIFICATION forming part of Letters Patent No. 786,379, dated April 4, 1905.

Application filed July 13, 1904. Serial No. 216,339.

To all whom it may concern:

Be it known that I, LOUIS PFINGST, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Power-Brakes, of which the following is a specification.

My invention relates to new and useful improvements in either mechanical hand and electric power combined or capable of operation independently of one another, and especially to brakes which are applied by power from an electric motor transmitting its power through a train of gears to a chain-winding spindle of vehicles or cars.

The object of this invention is to rotate the brake-spindle of a vehicle or car by electric power through clutch mechanism and compound gearing, combined with brake-handle capable of being operated separately or together—that is, the spindle can be operated by power without operating the handle either to its right or left rotation, or the spindle can be operated by hand-power in either direction without moving any of the electrical apparatus, or the spindle can be rotated by motor and hand power simultaneously for the winding or unwinding of the chain around the spindle when applying or releasing the brakes.

Another object of my invention is to compound the power of the motor through a train of gears to the upright brake-spindle; and a further object is to partially apply the brakes through clutch mechanism without using all of the power that the motor possesses when running and with the circuit fully cut in.

These and other objects are accomplished by mechanism shown and hereinafter described.

My invention consists of certain novel features hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, which illustrate a construction embodying my invention, Figure 1 is a side elevation of part of a car, showing the location of the improved hand and motor geared brake-spindle when not in operation with the shoes not applied to the wheels. Fig. 2 is a top plan view with the body of the car removed and showing the mo-

tor-geared driven brake-spindle located on the platform of the car and also the brake-lever mechanism with the shoes not applied. Fig. 3 is a sectional elevation of the base-frame, motor-frame, and extension-frame clutch mechanism, gears, ratchet-wheel, the hub, with the brake-spindle in full lines, and the portable loose revoluble handle partly in section. Fig. 4 is a sectional elevation of the base-frame, motor-poles, motor-frame, bed-plate, and portable extension-frame, with brush-arms, brake-insulating washers, the armature, shaft-spindle, clutch mechanism, and foot-lever in full lines. Fig. 5 is a longitudinal sectional view on the line X X, Fig. 3. Fig. 6 is a longitudinal sectional view on the line X' X', Fig. 3. Fig. 7 is a longitudinal sectional view on the line X² X², Fig. 3. Like letters of reference refer to like parts throughout the several views.

The bed-plate A is bolted to the platform buffer-timber *a* of the car, and secured to said bed-plate A by suitable bolts is the base-frame or motor-support B.

B' and B² are brackets forming a support for the lever-fulcrum at B⁵.

B³ is an opening formed in the base-frame or motor-support to admit the lever for the operation of the clutch.

On the bed-plate A there is provided at its center a boss A' to form a guide or bearing for the lower end of the motor journal-shaft J², and adjacent thereto there is also a bearing to support and guide the brake-spindle M at A².

A³ represents ribs formed on the top side of the bed-plate, connecting with the boss A'.

A⁴ and A⁵ are openings in the bed-plate to admit of the electric conductors.

A⁶ represents bolt-holes and bolts passing through flange B⁴ of the base-frame B, thence through the bed-plate A and buffer-timber *a* and secured thereto.

B⁶ is a lever-spring to disengage the clutch members.

B⁷ and B⁸ are bolts to attach spring B⁶ to the frame B.

B⁹ and B¹⁰ are rivets passing through the frame B, also through the insulating-pieces

B¹¹ and B¹² to hold fast the contact-plates B¹³ and B¹⁴.

B¹⁵ is a projection on the base-frame B forming a cavity B¹⁶ for the housing of the 5 gear 1.

B¹⁷ forms a support for the motor-frame C.

B¹⁸ is an enlarged diameter of the motor base-frame B, forming a socket B¹⁹ for the insertion of the lower end of the motor-frame C.

10 B²⁰ represents tapped bolts passing through the enlarged portion B¹⁸, thence through the motor-frame C to the pole-pieces C', securing the same all in an assembled position.

D is the extension-frame, forming a housing or covering for the entire electric-motor 15 apparatus.

D' and D² are covers for the hand-holes D³ and D⁴, formed in the sides of the extension-frame D.

20 D⁵ represents bolt-holes to receive bolts to fasten the covers onto the extension-frame over the hand-holes D⁴ and D³.

D⁶ is a boss formed on the under side of the top of the extension-frame D, forming the 25 upper bearing at D²² for the armature-shaft J'.

D⁷ and D⁸ are insulating-bushings for the purpose of insulating the brush-holding brackets D⁹ D⁹.

D¹⁰ is a metal washer placed between the 30 bushing D⁸ and jam-nut D¹¹. The nut D¹¹, meshing with the thread on the lower end of the boss D⁶, is used for the purpose of fastening the brush-holding arrangement in a fixed position.

35 D¹² and D¹³ are the brush-holding arms secured to the bracket D⁹ D⁹. The brushes D¹⁶ and D¹⁷ make contact with the commutator J³.

D¹⁸ is a boss on the top of the extension-frame D, forming a guide and bearing D²¹ for 40 the upper end of the brake-spindle M.

D¹⁹ is an enlarged diameter of the extension-frame D, housing and passing over the upper end of the motor-frame C.

45 D²⁰ D²⁰ are tapped bolts passing through the enlarged part of extension-frame D, through the motor-frame C, and securing the pole-pieces C', and thereby holding the upper portion of the apparatus in an assembled form.

J is the motor-armature with extended shaft 50 ends forming journals J' and J². The lower journal J² has a guide and step bearing A' in the bed-plate A, and the upper journal end J' has a guide and bearing in the boss D⁶ at D²².

By this means the motor-armature is held in 55 place whether the motor is in operation or not.

On a portion of the lower armature journal-shaft J² there is fixed a driving clutch member J⁴, and below this member there is an idle or driven clutch member E, loosely surrounding 60 ing and guided by the shaft J².

E' is a pinion-gear that is a part of the driven clutch member E and is attached by the throat E².

E³ is a loose-fitting ring for the clutch mem-

ber E, so that the two clutch members can be 65 brought together.

F is the long end of a foot-lever.

F' F' is the short end bifurcated and bridged on its under side by the piece F⁴. The lever F is fulcrumed on the pin F² at B⁵. The pin 70 is supported by the brackets B' B².

G is an extension-arm pivoted loosely on the pin F² and resting on the bridging-piece F⁴ and passing between the arms F' F'. The arm G at or near its center separates, forming 75 ing two arms G' G', uniting again at the rear, and from this portion there is a projecting piece G², to which the insulating-bars G³ G³ are attached. These are to prevent the current from running into the other parts of the 80 apparatus from the contact-finger G⁴. The finger G⁴ is attached to the bars G³ G³. On the double arm G' G' at its center there are holes to permit tapped bolts G⁵ and G⁶ entering and being screwed into each half of the 85 clutch-ring E³, thereby forming a pair of trunnions, so that the clutch member E can be brought in contact with the clutch member J⁴.

On the spindle M and attached thereto is a ratchet-wheel H, resting on the bed- 90 plate A, and coöperating with said ratchet-wheel H is a pawl H', pivoted on the pin H². The pawl H' rests on the flange B⁴ of the base-frame. Above the ratchet-wheel H there is a spur-gear 1, attached by the pin 2 passing 95 through the hub of the gear and brake-spindle and also keyed by the key I'. The gear 1 meshes in with the pinion E'. At or near the top of the spindle M there is attached a hub M². This hub and the projecting spindle 100 M³ are housed over by the hub of the handle N, formed by the chambers N' and N². The hub M² and the spindle M³ support the handle N.

N³ is a bell-crank lever supported and pivoted 105 on the pin N⁴ on the brackets N⁵, formed on the handle N. There is also a tension-spring N⁹ interposed between the handle N and the bell-crank lever N³. On the lower end of the vertical arm of the bell-crank lever N³ there is attached and loosely connected 110 at N⁶ a reciprocating pin N⁷, which passes through the opening N⁸, formed in the walls of the hub of the handle and operated by the bell-crank. The pin N⁷ continues and passes 115 into openings M⁴ of the hub M². Just below the top of the spindle M there is an annular groove M⁵ to permit a pin to work loosely therein and prevent the displacement of the handle. This pin performs no function as to 120 the operation of the handle and said handle may be operated without it. The pole-fields K are for the purpose of magnetizing the poles of the motor.

L is the section of the armature-winding on 125 the line X X, Fig. 3, and L' is the armature-core.

The mode of operating the motor-geared

brake-spindle to set the brakes is as follows: First, the operation is to cut in the current starting the motor to run while the clutches are disengaged; second, to apply the brakes the operator engages, by the mechanical means of pressure or otherwise, the clutch members E and J¹ with each other. This will rotate the pinion E', which meshes in with the gear 1 which is keyed to the spindle M, and by this means it will rotate the spindle M, winding up the chain M'. During this operation in order to prevent the rotating of the handle N the operator disengages the pin N⁷ from the hub M² by the crank-handle N³, at the same time holding the handle N. This will allow the rotating of the spindle M in the chambers N' and N² of the handle N, thereby winding up the chain, pulling the brake-rod *g*, actuating the brake-lever I, thence pulling the rods *l* and actuating the truck-levers *m*, thereby setting the brakes. When the brake is sufficiently set, the motor clutch member E is disengaged from the member I⁴, thereby cutting out all electric-motor power. During this operation the pin N⁷ is permitted to enter one of the openings M⁴ in the hub M², after which the brake is held when set either by the brake-handle N or by the ratchet-wheel H and the pawl H'. To release the brakes, the operator disengages the ratchet-wheel and pawl and the pin N⁷ from the hub M². During this operation the operator has hold of the handle N. The spindle will automatically unwind itself, rotating in the handle-chamber. At the same time the operator might release the handle N, allowing it to rotate with the spindle M. By either method the brake can be fully released. To operate the spindle and the motor simultaneously by motor and hand power, the operation would be to cut in current in the motor and engage the clutches, and at the same time the operator puts pressure on the handle N. The reverse operation would release the brakes.

In order to operate the spindle without moving any of the motor apparatus, the operator must disengage the clutches and turn the handle to the right, thus winding up the chain and setting the brakes. To release, there are two methods: first, to allow the handle to revolve with the spindle, or to disengage the pin N⁷, holding the handle still and allowing the spindle to rotate in the handle-chamber. It does not follow by this construction that the motor must run continuously. It can be started to rotate just before the clutch member J¹ and E are engaged, while operating the clutch-lever F.

As shown in Figs. 1 and 2, the construction of the platform and car-bottom frame consists of buffer-timbers *a* with a platform-flooring *b*. *c c c c* are the supporting-timbers, fastened to the body of the car and supporting the flooring *b* and buffer-timber *a*. *d* is the end sill, which is fastened to the ex-

treme end of the side sill *e*. *f* represents the bottom-frame cross-timbers, which are fastened to the side sill *e* to support the flooring. To the end sill *d* and side sill *e* the end frame and side frame of the car are secured in the usual manner of car-building. *g* is the main brake-rod, and at one end of said rod is connected the brake-chain M', and the other end is pivotally connected to the center brake-lever *h*. The main or center brake-lever *h* is supported by the bracket *i*, secured to the bottom of the car, and has a loose-motion slot *j*, and said brake-lever *h* is held in place by the pin *k*. Pivotaly connected to the main brake-lever *h* is the secondary brake-rod *l*, pivoted at its opposite end to the truck brake-lever *m*, which is pivoted on the brake-beam *p*. At the lower end of the brake-lever *m* is pivotally connected the brake-rod *o*, which at its opposite end is connected to the truck-adjusted arm *n*. On the ends of the brake-beams *p* are fastened the brake-shoes *q*, which come in contact with the periphery of the wheels *r*, mounted on the axle *s*. The brake-rod *g* and the secondary rod *l* (shown on the right of Fig. 1 and Fig. 2) extend forward and are connected to similar mechanism at the right-hand end of the car. The operation of this mechanism is as follows: By rotating the spindle M and winding up the chain M' the brake-rod *g* will be pulled forward, thereby actuating the brake-lever *h*. This will pull in the opposite direction the secondary rods *l*, and by this operation the secondary rods will pull the truck-levers *m* toward the center of the car, pressing out the bottom end of the levers *m* toward the end of the car, causing the brake-beams *p* to travel in the opposite direction and thereby apply the brake-shoes to the wheels. By the arrangement of the spindle with the brake-handle as hereinbefore described the spindle can revolve in either direction without rotating the handle, or the handle can be rotated in either direction without rotating the spindle or motor, or, if desired, the handle can rotate the spindle without rotating the motor or operate both at the same time. To rotate the motor-armature without current, the clutch member E is brought into engagement with the clutch member J¹ by the foot-lever arrangement F, so that by the rotation of the handle when clutch members are engaged the gear becomes operative from the spindle to the armature-shaft, thereby enabling same to be rotated.

I do not limit myself to the arrangement and construction shown, as the same may be varied without departing from the spirit of my invention.

Having thus described the nature of my invention and set forth a construction embodying my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus of the character de-

scribed, a rotating hand-power brake-spindle or shaft-motor geared and capable of being rotated by a revoluble electric motor transmitting power through clutch-and-gear mechanism to apply the car-brakes, and hand-power and spindle mechanism independent of the motor mechanism, the motor-shaft and spindle having independent alinement centers.

2. In an apparatus of the character described, a brake spindle or shaft capable of being rotated by an electric motor through clutch-and-gear mechanism and provided with hand-power mechanism, a spur-gear fixed to said spindle meshing with a pinion loosely mounted on and independent of the electric-motor-shaft mechanism and capable of being rotated, when operating said motor while the clutch members are engaged to wind up the chain.

3. In an apparatus of the character described, a brake-spindle or shaft capable of being operated by an electric motor for the winding up of the brake-chain, and provided with hand-power mechanism, a spur-gear fixed to said spindle meshing with a pinion loosely mounted on an electric-motor shaft and adapted to rotate the motor-shaft when operating said spindle through the gear and clutch-engaging mechanism.

4. In an apparatus of the character described, a brake-spindle adapted to be rotated by directly-connected hand-power mechanism or by an electric-motor mechanism, the armature of said motor having extended journal-shafts, the motor mechanism and the hand-power mechanism being independent of each other, the spindle-shaft and motor-shaft having separate alinement centers, and means for transmitting power interposed between spindle and motor-shaft, the hand or motor power being capable of rotating spindle to simultaneously or separately operate the brake mechanism.

5. In an apparatus of the character described, a brake-spindle adapted to be rotated by directly-connected hand-power mechanism, an automatic continuously-rotating electric motor supplied with electric current and provided with extended journal-shafts, guide-bearings for said extended shaft-journals, mechanical means for transmitting power from said electric-motor shaft to the brake-spindle for applying or releasing the car-brakes, and journal guide-bearings for said spindle, the motor and spindle journal guide-bearings having separate alinement centers.

6. In an apparatus of the character described, a brake-spindle adapted to be rotated by a portable directly-connected hand-power mechanism, an automatic continuously-rotating electric motor supplied with electric current and provided with extended journal-shafts, guide-bearings for said extended shaft-journals, mechanical means for transmitting power from said electric-motor shaft to the

brake-spindle for applying or releasing the car-brakes, and journal guide-bearings for said spindle, the motor and spindle journal guide-bearings having separate alinement centers.

7. In an apparatus of the character described, a brake-spindle adapted to be rotated by a portable directly-connected hand-power mechanism, a chamber in said hand-power mechanism adapted to be loosely mounted on the top of said spindle and capable of being loosely rotated either to the right or left without rotating said spindle, an automatic continuously-running electric motor supplied with an electric current and provided with extended journal-shafts, guide-bearings for extended shaft-journal, and mechanical means for transmitting rotating power from the rotating electric-motor armature-shaft to the brake-spindle for applying or releasing the car-brakes, the motor journal guide-bearings and the spindle journal guide-bearings having separate alinement centers.

8. In an apparatus of the character described, a motor-power-geared brake-spindle capable of being rotated by hand-power mechanism to simultaneously or independently wind or unwind the brake-chain of a car for actuating the brake mechanism in stopping or starting a car.

9. In an apparatus of the character described, a motor-power-geared brake-spindle capable of being rotated by an automatic continuous-current electric motor transmitting rotary power through clutch mechanism and gears to said spindle for the winding up of the brake-chain to actuate the brake mechanism in stopping a car, said motor or parts for the electrical operation of said motor being independent of said spindle mechanism.

10. In an apparatus of the character described, a brake-spindle, an electric motor with rotating armature-shaft and extended journals, a fixed clutch member on said shaft, a companion clutch member loosely mounted on said shaft and provided with a pinion-gear, and means for engaging the clutch members thereby rotating the pinion-gear and transmitting a rotary motion to the brake-spindle and the winding up of the brake-chain, said brake-spindle being provided with a portable hand-power mechanism to rotate said spindle.

11. In an apparatus of the character described, a brake-spindle, an electric motor with rotating armature-shaft and extended journals, said shaft provided with a fixed clutch member, a companion clutch member loosely mounted on said shaft and provided with a pinion-gear, means for engaging the clutch members thereby rotating the pinion-gear and transmitting rotary motion to the brake-spindle for the winding up of the brake-chain, portable hand-power mechanism for operating said spindle, disengaging clutch mechanism between said handle and said spin-

dle to allow said spindle to rotate in a chamber of said handle when operated by the motor and to allow said handle to loosely rotate on said spindle without rotating said spindle or said motor.

12. In an apparatus of the character described, a brake-spindle supported in journal-bearings and provided with a gear, a continuous-current electric motor, a rotating armature-shaft provided with extended shaft-journals supported in guide journal-bearings, a fixed clutch member on said shaft, a companion clutch member provided with a clutch pinion-gear and loosely mounted on said shaft, means for engaging the loose clutch member with the fixed clutch member for rotating said loose clutch member and gear thereby transmitting rotating motion to the spindle-gear and rotating the spindle thereby causing the brake-chain to be wound up applying the brakes to stop the car, and hand-power mechanism for said spindle.

13. In an apparatus of the character described, a power-driven brake spindle or shaft adapted to wind up chain and to let off or to hold what has been taken up, an electric motor with extended shaft-journals, the spindle-shaft and extended armature-shaft having separate independent shaft centers, a clutch member fast on the armature-shaft, a companion clutch member provided with a pinion-gear and loosely mounted on the armature-shaft, a gear mounted on said brake-spindle and connecting with said clutch-gear for transmitting motion of the armature-shaft to the brake-spindle for applying the car-brakes, and a loose revoluble handle on said brake-spindle.

14. In an apparatus of the character described, a motor-clutch and gear-driven brake-spindle, a rotating electric-motor armature-shaft, means for transmitting power from said rotating armature-shaft for rotating said spindle, and mechanism for causing the engagement of said means.

15. In an apparatus of the character described, a rotating hand-power brake spindle or shaft for applying or releasing the brake mechanism, an electric motor, extended armature-shafts on the armature of said motor, the spindle-shaft and armature-shaft occupying separate shaft centers, and means for transmitting rotary power from the armature-shaft to the spindle-shaft or chain-winding drum to apply or release the car-brakes.

16. In an apparatus of the character described, a rotating hand-power brake-spindle for applying or releasing brake mechanism, an electric motor, extended armature-shafts on said motor, the spindle-shaft and the armature-shaft occupying separate shaft centers, and means for transmitting rotary power from the armature-shaft to the spindle-shaft or chain-winding drum to apply or release the

car-brakes, the said spindle-shaft being provided with a fixed ratchet-wheel engaging a pawl for holding said spindle when the brakes are being applied.

17. In an apparatus of the character described, a brake-spindle, a brake-handle on the upper end of said spindle, a brake-chain on the lower end of said spindle and adapted to be wound and unwound thereon, journal guide-bearings for supporting said spindle, an electric motor located in relation to said spindle, and means for transmitting power from the motor to the spindle for rotating said spindle for applying or releasing the car-brakes independently of the hand-power mechanism, the motor-shaft and the spindle-shaft having independent shaft centers.

18. In an apparatus of the character described, a power-driven brake-spindle and clutch, hand-power mechanism for said spindle, a motor located in relation to said spindle, and mechanical means for intermittently supplying power to said spindle from a rotating motor, the spindle-shaft and motor having independent shaft centers for applying or releasing the brakes.

19. In an apparatus of the character described, a brake-spindle capable of being revolved, a revolving electric-motor armature provided with extended shafts, the spindle-shaft and motor-shaft occupying separate centers, and means for transmitting revolving motion to the spindle for applying or releasing the brakes.

20. In an apparatus of the character described, a brake-spindle capable of being revolved, an electric motor, a rotating motor-armature provided with extended shafts, means for transmitting rotating motion to said spindle, the spindle and motor shafts occupying separate shaft centers, and a handle for said spindle for applying or releasing the brakes.

21. In an apparatus of the character described, a motor-gear and hand-power-driven brake spindle or shaft, a handle mounted and supported on said spindle, means for disengaging the mechanism of the spindle and handle to allow the spindle to rotate in the chamber of said handle when the motor-power is rotating the spindle winding up the chain to set the brakes or to rotate in said chamber in the opposite direction when said chain is unwinding to release said brakes.

22. In an apparatus of the character described, a motor-clutch and geared power-driven brake spindle or shaft capable of being revolved, an electric-motor armature, means for transmitting motion to said spindle or shaft to wind up the chain and actuate the equalizing brake mechanism for applying the brakes.

23. In an apparatus of the character described, a clutch and geared motor-power-driven brake-shaft or chain-winding drum ca-

pable of being rotated by motor-shaft when connected with actuating clutch-and-gear mechanism for applying the brakes.

24. In an apparatus of the character described, a motor-clutch-gear power-driven brake-shaft or chain-winding drum capable of being rotated when connected by actuating clutch-and-gear mechanism to the shaft of a revolving motor-armature for applying the brakes, and a handle mounted on said brake-shaft to rotate same.

25. In an apparatus of the character described, a hand-power and motor-gear power-driven chain-winding brake spindle or shaft, an electric motor, the spindle-shaft and the motor-shaft being connected by power-transmitting gears for applying or releasing the car-brakes and capable of being operated by hand-power or motor-power independent of each other, said motor capable of being rotated without rotating the spindle and hand-power mechanism of said spindle.

26. In an apparatus of the character described, a hand-power-driven brake-spindle provided with a handle capable of being loosely and independently revolved on said spindle, motor clutch members and gears capable of rotating said spindle for applying or releasing the brakes, and means in the chamber of said handle to allow the spindle to rotate therein.

27. In an apparatus of the character described, a revoluble chain-winding brake-spindle for applying or releasing the car-brakes, a revoluble continuous electric motor, extended journal-shafts on the armature of said motor, actuating clutch mechanism supported on the armature-shaft, gears interposed between said revoluble spindle and revoluble armature-shaft, the spindle-shaft and motor-shaft having independent shaft centers.

28. In an apparatus of the character described, a revoluble chain-winding brake-spindle provided with hand-power mechanism, a revoluble continuous electric motor, extended journal-shafts on the armature of said motor, actuating clutch mechanism supported on the armature-shaft, power-transmitting gears interposed between said revoluble spindle and revoluble armature-shaft, the spindle and motor-shaft having separate shaft centers.

29. In an apparatus of the character described, a revoluble power-driven brake-spindle, hand-power mechanism for said spindle, a source of power located below said hand-power mechanism and abreast of the spindle, and means for transmitting rotary motion from a revolving motor to rotate said spindle for applying the car-brakes.

30. In an apparatus of the character described, a chain-winding brake-shaft provided with a gear, an electric motor, the armature of said motor having extended shafts and provided with a fixed clutch member, a companion gear, a clutch member loosely mounted on

said extended shaft, the gear of the companion clutch member adapted to mesh with the gear of the brake-shaft and to rotate said shaft to wind up the chain and set the brakes, and a handle adapted to rotate said shaft to wind up said chain.

31. In an apparatus of the character described, a chain-winding brake-shaft adapted to be rotated by hand-power mechanism or motor mechanism, said hand-power mechanism and motor mechanism, being independent of each other, brake and motor shafts having separate alignment centers, and means for transmitting power interposed between said brake-shaft and said motor-shaft, the hand or motor power being capable of rotating brake-chain shaft to simultaneously wind or unwind chain to set or release car-brakes.

32. In an apparatus of the character described, a chain-winding brake-shaft for applying or releasing car-brakes, a motor provided with a shaft having a fixed clutch member, a companion clutch member loosely mounted on the motor-shaft, means for engaging the two clutch members, a gear fixed to the loose clutch member meshing with a gear fixed on the brake-shaft thereby rotating said brake-shaft, the upper end of said brake-shaft provided with a disengaging clutch-handle capable of being held in a fixed position to permit the brake-shaft to rotate in the chamber of said handle while the revolving motor is transmitting power to the spindle by the actuating clutch-and-gear mechanism for winding up chain and for holding by the handle when the handle-clutch is engaged with the spindle that which had been taken up while the motor-clutch is disengaged, thus cutting off the source of power from the revolving motor.

33. In an apparatus of the character described, a hand-power chain-winding-brake shaft adapted to wind up and let off the brake-chain, a brake-shaft geared to the motor-shaft, a source of power for rotating the motor-shaft and transmitting by the aid of gear mechanism a rotating motion to the brake-shaft, a handle mounted on said brake-shaft, and means on said brake-shaft and in the chamber of said handle to engage one another for the applying or releasing of car-brakes by hand-power.

34. In an apparatus of the character described, a chain-winding hand or power driven brake-shaft, a power-motor provided with a shaft, the brake-shaft and motor-shaft centers independent of one another in their alignment, a power clutch-and-gear mechanism interposed between the two shafts for transmitting power from the motor-shaft to the brake-shaft, a hand-power handle for said brake-shaft provided with means for engaging and disengaging the brake-shaft and capable of permitting the brake-shaft to rotate in the chamber of said handle when the handle is held in a fixed position.

35. In an apparatus of the character described, a hand-power chain-winding brake-shaft adapted to be driven by power, an electric-power motor, the armature of said motor having extended shaft-journals, a driving clutch member for said extended shaft-journals, an idle companion clutch member provided with a gear and loosely mounted on the extended shaft, means for engaging the two clutch members, and a gear mounted on said brake-shaft for engaging the clutch-gear and by said means to rotate the brake-shaft to wind up or let off the brake-chain in applying or releasing the car-brakes.

36. In an apparatus of the character described, a hand or power chain-winding brake-shaft, a motor provided with a power-shaft, brake-shaft and motor-power shaft occupying independent alinement centers, actuating power clutch members mounted on the power-shaft and provided with a gear to mesh with the gear on the brake-shaft and said brake-shaft capable of being rotated by the power-shaft or hand-power handle to wind up chain to apply car-brakes.

37. In an apparatus of the character described, a motor provided with a power-shaft, brake-shaft and motor-shaft occupying independent alinement centers, and rotatable power-driven gears interposed between the brake-shaft and power-shaft for applying or releasing the car-brakes, the hand-power mechanism and motor-power mechanism being independent of each other, and the motor-shaft capable of being rotated without rotating the brake-shaft or hand-power mechanism.

38. In an apparatus of the character described, a combined hand or power rotating chain-winding brake-shaft, an electric motor provided with a rotating shaft, gears interposed between the brake-shaft and motor-shaft, a power-clutch provided to interlock the gears and to thereby rotate the chain-winding brake-shaft, the brake-shaft and hand-power mechanism independent of said motor mechanism, and motor mechanism independent of brake-shaft or hand-power mechanism, the shaft centers being independent of each other.

39. In an apparatus of the character described, a chain-winding brake-shaft capable of being rotated either by hand or motor power, a handle for said brake-shaft, a revolving electric motor provided with a revolving armature-shaft, rotating power-transmitting gears interposed between the brake-shaft and the armature-shaft for the rotating of said brake-shaft, handle for said spindle provided with clutch mechanism in the chamber of said handle for engaging the brake-shaft and capable of rotating same to wind up the brake-chain and set the brakes.

40. In an apparatus of the character described, a hand or power driven chain-winding brake-shaft capable of being rotated, a

handle mounted on said shaft, a revolving electric motor, an armature-shaft adapted to rotate said shaft by the aid of power clutch and gears interposed between the brake-shaft and armature-shaft, a loose revolving handle for said brake-shaft, clutch mechanism in the chamber of said handle to engage said brake-shaft in combination with equalizing brake mechanism for applying or releasing the brakes.

41. In an apparatus of the character described, a rotatable chain-winding brake-shaft for applying or releasing the car-brakes and provided with a combination loose and fixed hand-power mechanism and capable of being rotated by the revolving shaft of an electric motor, the shaft of said motor provided with a power-transmitting clutch, a gear fixed to said clutch and supported on and guided by the motor-shaft and meshing with a gear mounted on and fixed to the brake-shaft capable of being rotated by the motor-shaft through the clutch-and-gear mechanism.

42. In an apparatus of the character described, a rotatable chain-winding brake-shaft capable of being rotated by a revoluble continuous electric motor or by hand-power mechanism, the armature-shaft of said motor provided with extended journal-shaft, power-transmitting clutch-and-gear mechanism interposed between the brake-shaft and the motor-shaft and adapted to rotate the chain-winding brake-shaft, a handle capable of being held unrotating while the revolving motor transmits its rotatable power through the clutch-and-gear mechanism to the brake-shaft permitting the brake-shaft to rotate in the chamber of said handle while winding up the chain to set the brakes.

43. In an apparatus of the character described, a chain-winding brake-shaft supported by bearings in a frame mounted on a car and provided with a hand-power handle, said brake-shaft adapted to be rotated by motor-power, a motor provided with a revolving shaft held by guide-bearings supported by a frame mounted on a car, power-transmitting clutch and gears interposed between the brake-shaft and motor-shaft and adapted to rotate the brake-shaft to wind up the chain to apply the car-brakes.

44. In an apparatus of the character described, a chain-winding brake-shaft capable of being rotated by hand or motor power, a revoluble electric motor, the armature of said motor having extended shaft-journals, guide-bearings for said journals, clutch-and-gear mechanism supported on and guided by the armature-shaft, a gear mounted on the brake-shaft meshing with the gear on the armature-shaft and capable of being rotated, a hand-power handle capable of being held in a fixed unrevolving position while the revolving motor is transmitting its motion to the brake-shaft, said handle capable of holding through

the spindle the chain when the motor clutch members are disengaged and to allow the motor to run idly.

45. In an apparatus of the character described, a chain-winding brake-shaft for applying or releasing the car-brakes capable of being driven by hand or motor power, a rotatable hand-power handle for said brake-shaft, a motor provided with a revoluble shaft and capable of rotating the brake-shaft by power-transmitting clutch-and-gear mechanism interposed between the brake-shaft and the motor-shaft for rotating said shaft winding up chain thereby applying the brakes.

46. In an apparatus of the character described, a frame mounted on a car supporting a chain-winding brake-shaft for applying or releasing the car-brakes, an operating-handle mounted on said shaft, a revolving electric-motor armature-shaft supported by a frame, the brake-shaft capable of being rotated by the motor-shaft through the aid of rotating transmitting power-clutch, and power-transmitting gears interposed between the shafts, the brake-shafts and motor-shaft occupying separate alinement shaft centers.

47. In an apparatus of the character described, a chain-winding brake-shaft for applying or releasing the car-brakes provided with an operating-handle and supported in guide-bearings mounted in a frame, a revolving motor-shaft mounted in a frame, and means interposed between the shafts to rotate the brake-shaft to wind up chain by the revolving motor-shaft, the brake-shaft and the motor-shaft occupying different shaft-centers.

48. In an apparatus of the character described, a chain-winding brake-shaft for applying or releasing car-brakes and capable of being driven by hand or motor power, an operating-handle mounted on said brake-shaft, a rotating motor located adjacent to the brake-shaft, the brake-shaft and motor-shaft supported in a frame mounted on a car, the brake-shaft adapted to be rotated by the motor-shaft transmitting its power through actuating power clutch-and-gear mechanism, a clutch-lever, and a current-closing contact part on said lever.

49. In an apparatus of the character described, a hand or power driven chain-winding brake-shaft, a handle for said brake-shaft, a motor provided with a revoluble shaft, power-transmitting gear attached to the brake-shaft, a clutch member fixed to the motor-shaft, a combined companion clutch member and gear loosely mounted on the motor-shaft and capable of rotating the brake-shaft when the clutch members are engaged, a ratchet-wheel fitted to spindle, and a pivoted pawl for engaging the ratchet-wheel for holding the wound-up chain when the clutch members are disengaged from the source of power, all supported in a frame mounted on a car.

50. In an apparatus of the character de-

scribed, a revoluble electric motor having extended motor-shafts supported in a frame mounted on a car, the extended shafts of the revolving motor fitted with a power-transmitting clutch capable of rotating intermittently by mechanical means, a chain-winding brake-shaft supported by a frame mounted on a car for the applying or releasing of car-brakes, and means for holding the brake-shaft when the brakes are applied independently of the revolving motor-shaft.

51. In an apparatus of the character described, a revoluble electric motor having extended shafts supported in a frame mounted on a car, the extended shafts of the revolving motor fitted with a power-transmitting clutch capable of rotating intermittently by mechanical means, a hand-power chain-winding brake-shaft for the applying or releasing of car-brakes, and means for holding the brake-shaft when the brakes are applied independently of the revolving motor-shaft, the brake-shaft and motor-shaft having separate alinement centers.

52. In an apparatus of the character described, a hand or power chain-winding brake-shaft geared to a member of a power-transmitting clutch and capable of being rotated when clutch members are engaged by a revolving motor-shaft, the brake-shaft and motor-shaft having separate alinement centers, a handle for said brake-shaft, and means in the chamber of said handle for locking same to the brake-shaft and capable of being unlocked from the brake-shaft to permit the rotating of the brake-shaft in the chamber of handle when rotated by power to wind up chain to apply the brakes.

53. In an apparatus of the character described, a chain-winding brake-shaft for the applying or releasing of car-brakes and capable of being rotated by hand or motor power, a brake-shaft geared to a member of a power-transmitting clutch mounted on a loosely-revoluble motor-shaft, a companion clutch member fixed to the revoluble motor-shaft, means for engaging the clutch members and adapted when the clutch members are engaged to rotate the brake-shaft to wind up the brake-chain in applying the car-brakes, a handle for said brake-shaft capable of rotating to apply or release the car-brakes, the brake-shaft and motor-shaft occupying separate alinement centers.

54. In an apparatus of the character described, a chain-winding brake-shaft for applying or releasing car-brakes adapted to be rotated by hand or motor power, an operating-handle mounted on said brake-shaft, a motor provided with a revoluble motor-shaft, said shaft fitted with a power-transmitting clutch, a gear fixed to one part of the power-clutch, and a power foot-lever for engaging the clutch members to rotate the gear for transmitting its motion to a gear fixed on a brake-shaft

thereby rotating same to wind up chain to apply brakes.

55. In an apparatus of the character described, a chain-winding brake-shaft capable of being rotated by hand or motor power, the upper end of the brake-shaft fitted with a brake-handle for rotating said shaft, means in said handle to loosely rotate same on said shaft, a motor provided with a revoluble motor-shaft, and a gear mounted on the brake-shaft meshing with a gear loosely mounted on the motor-shaft and fixed to part of a power-clutch adapted to receive rotating power from the motor-shaft for transmitting same to the brake-shaft to wind up chain and set brakes.

56. In an apparatus of the character described, a rotatable chain-winding brake-shaft for applying or releasing car-brakes and capable of being rotated by hand or motor power, a revoluble electric motor provided with an armature-shaft having extended journal-shafts, brake-shaft and armature-shaft occupying independent and separate shaft centers, and an armature-shaft capable of rotating the brake-shaft by the aid of clutch-and-gear mechanism interposed between shafts to wind up or let off chain in applying or releasing the car-brake mechanism.

57. In an apparatus of the character described, a combined hand or motor power rotatable chain-winding brake-shaft, and a motor provided with a revoluble motor-shaft capable of rotating the brake-shaft by power-transmitting mechanism, the brake-shaft and motor-shaft occupying separate alinement centers, and the said brake-shaft capable of being rotated by hand-power handle for the winding up or letting off of chain for the applying or releasing of car-brake mechanism.

58. In an apparatus of the character described, a combined hand or motor power rotatable chain-winding brake-shaft, and a motor with a revoluble motor-shaft capable of rotating intermittently by mechanical means, the brake-shaft through power-transmitting mechanism, the brake-shaft and motor-shaft occupying separate alinement centers, and the brake-shaft capable of being rotated by hand-power handle for the winding up or letting off of chain for the applying or releasing of car-brake mechanism.

59. In an apparatus of the character described, a rotatable chain-winding brake-shaft capable of being operated by hand or motor power, the brake-shaft adapted to be rotated simultaneously by a rotatable electric-motor shaft or by hand-power mechanism independent of each other, the brake-shaft and the motor-shaft occupying independent shaft centers all supported by a frame mounted on a car.

60. In an apparatus of the character described, a combined hand or motor power chain-winding brake-shaft, and a motor with a revoluble motor-shaft capable of rotating

the brake-shaft through clutch-and-gear mechanism without rotating the hand-power mechanism when winding up or letting off chain to apply or release the car-brakes, the brake-shaft and motor-shaft occupying separate alinement centers and supported by a frame mounted on a car.

61. In an apparatus of the character described, a chain-winding brake-shaft capable of being rotated by hand or motor power, a motor provided with a motor-shaft, clutch-and-gear mechanism interposed between the brake-shaft and the motor-shaft and capable of transmitting power from the motor-shaft to the brake-shaft when applying the car-brakes.

62. In an apparatus of the character described, a hand-power-driven chain-winding brake-shaft capable of being rotated by power, a motor located adjacent to the brake-shaft and provided with a revoluble shaft, lever-actuating clutch mechanism interposed between the brake-shaft and the motor-shaft, and means for transmitting rotating power from the clutch mechanism to the gear fixed on the brake-shaft for the rotating of same to wind up chain when applying the car-brakes.

63. In an apparatus of the character described, a hand-power chain-winding brake-shaft capable of being rotated by power, a motor provided with a rotatable shaft and adapted to supply intermittently-rotating power through clutch-and-gear mechanism to the brake-shaft, and a hand-power handle for the brake-shaft capable of holding the chain during intermissions that which had been taken up when the clutch mechanism had been applied intermittently and capable of being released by disengaging the mechanism in the handle from the brake-shaft.

64. In an apparatus of the character described, a hand or power rotatable chain-winding brake-shaft adapted to wind up or let off brake-chain or to hold what has been taken up, a revoluble hand-power handle mounted on the brake-shaft, an electric motor with extended shaft-journals located adjacent to the brake-shaft, gears interposed between the brake-shaft and the motor-shaft, and clutch mechanism when engaged arranged to rotate the gears interposed between the motor-shaft and the brake-shaft thereby rotating the brake-shaft to wind up chain and set brakes, the motor-shaft and the brake-shaft having separate alinement centers and supported in a frame mounted on a car.

65. In an apparatus of the character described, a power-g geared brake-shaft for applying or releasing the car-brakes capable of being driven by hand-power mechanism, a handle mounted on the brake-shaft, and a motor provided with a revoluble shaft fitted with clutch members and gear mechanism, said gear meshing with a gear on the brake-

shaft to rotate the same when the clutch members are engaged and receiving rotating power from the revolving motor-shaft, the brake-shaft and motor-shaft occupying separate alinement centers and supported by a frame mounted on a car.

In testimony whereof I have signed my name

to this specification, in the presence of two subscribing witnesses, this 9th day of July, A. D. 1904.

LOUIS PFINGST.

Witnesses:

A. L. MESSER,
E. L. HARLOW.