(No Model.)

2 Sheets—Sheet 1.

H. S. PARK.

ELECTRO MAGNETIC CAR BRAKE.

No. 353,880. Patented Dec. 7, 1886.

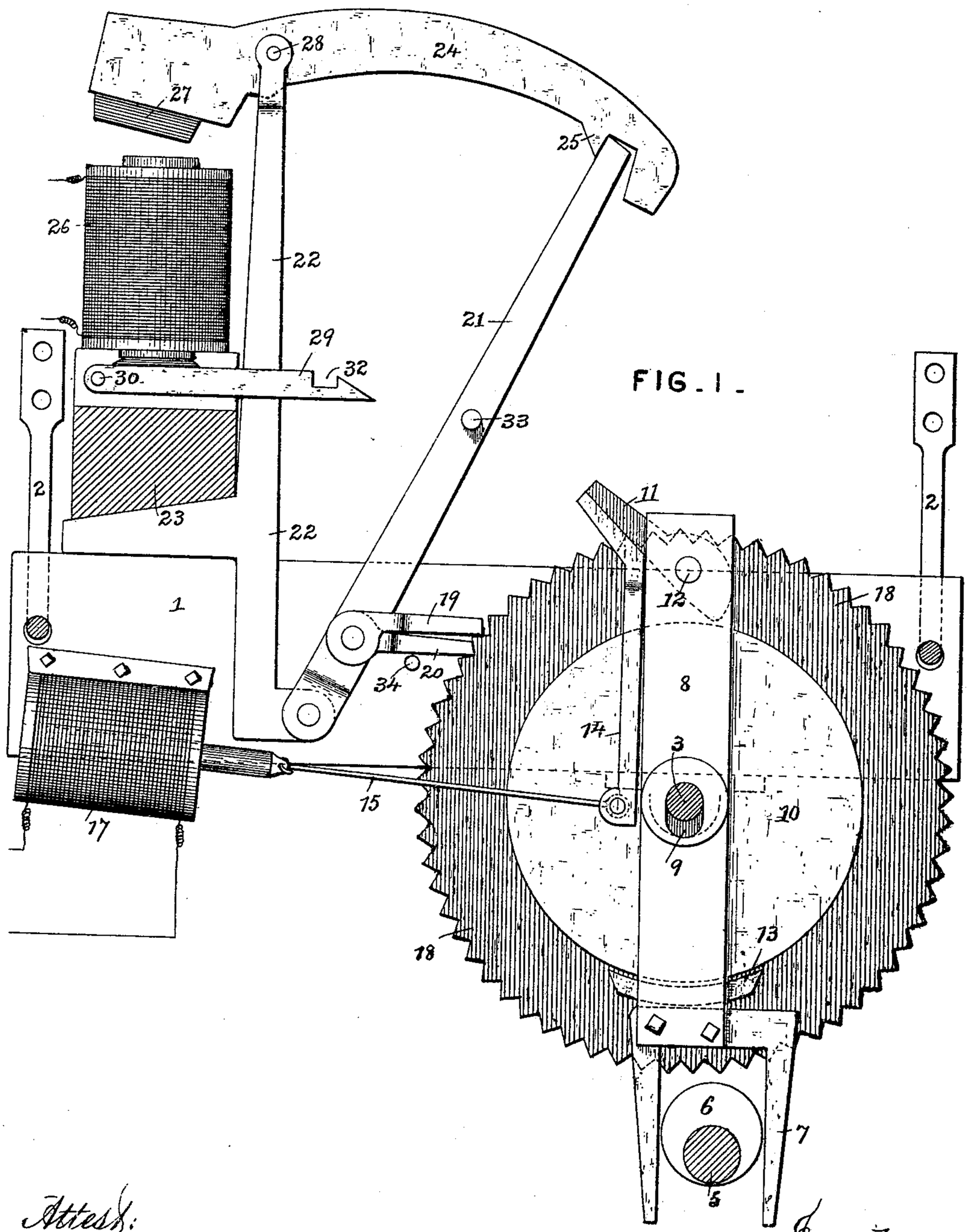

FIG. 1.

Attest:
Geo. T. Smallwood.
F. A. Hopkins.

Inventor:
Harvey S. Park
By Knight Bros.
Attys

(No Model.)

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FIG. II.

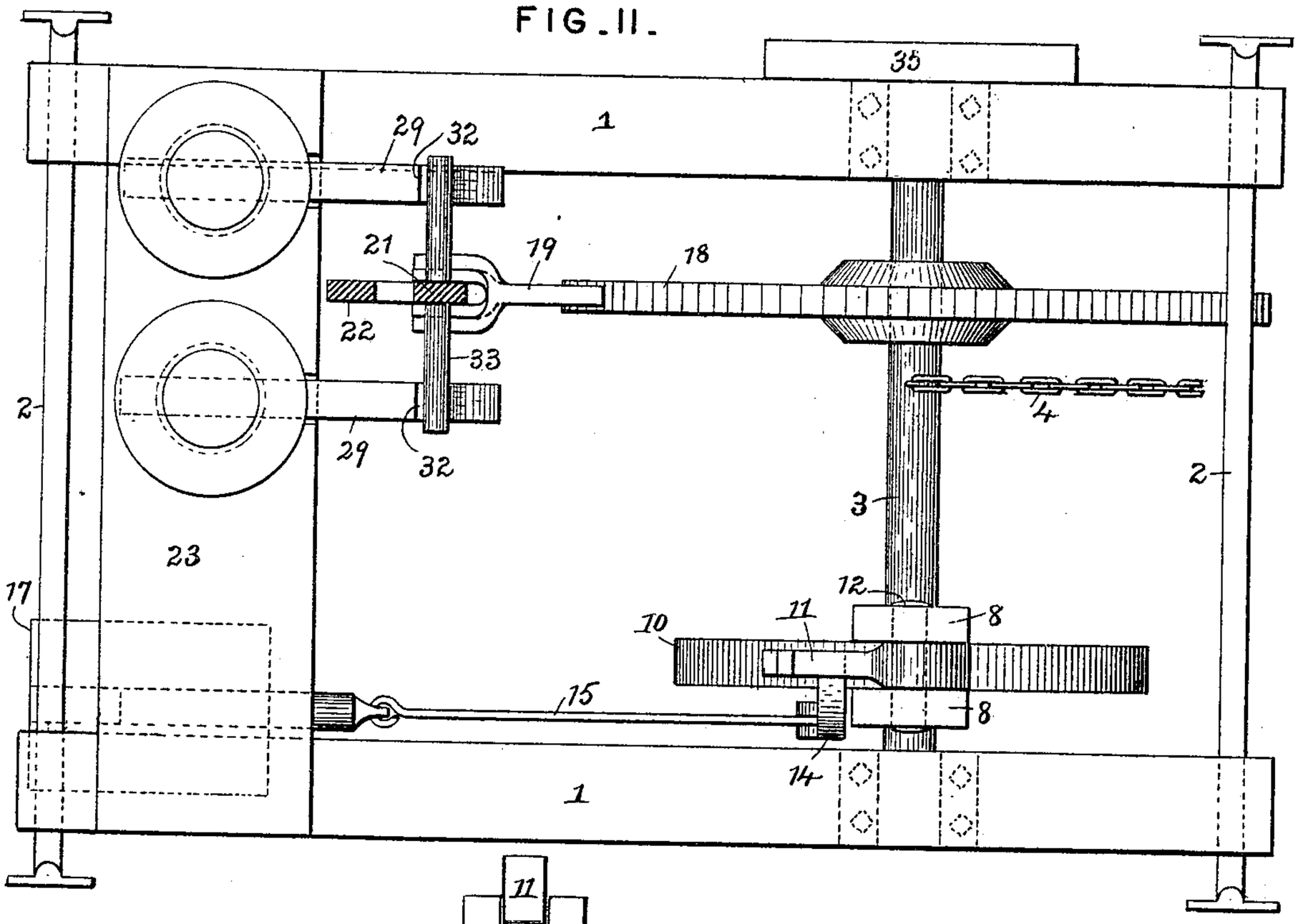


FIG. III.

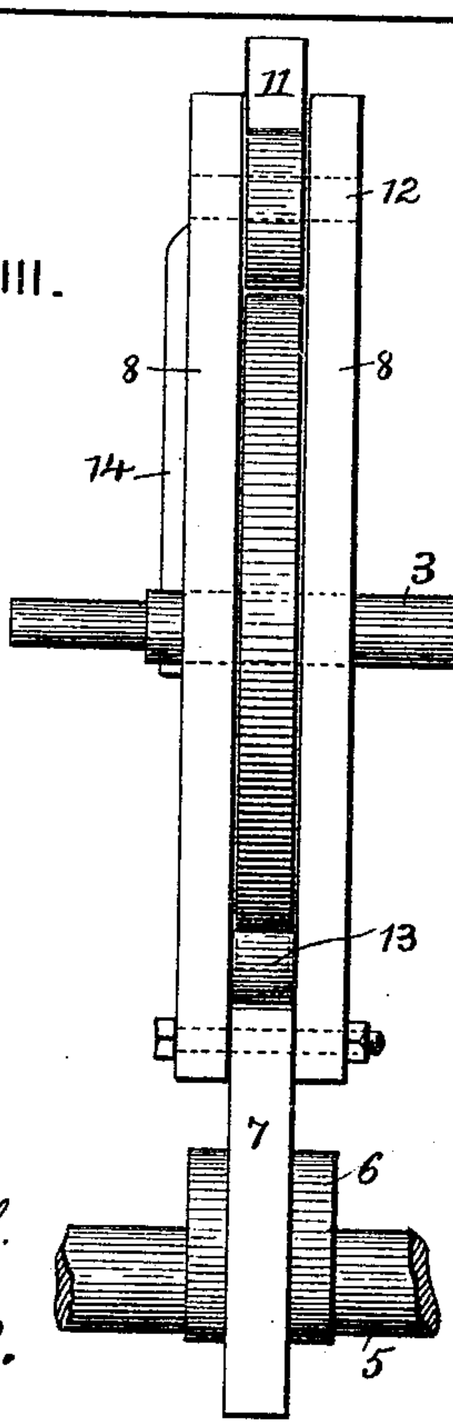
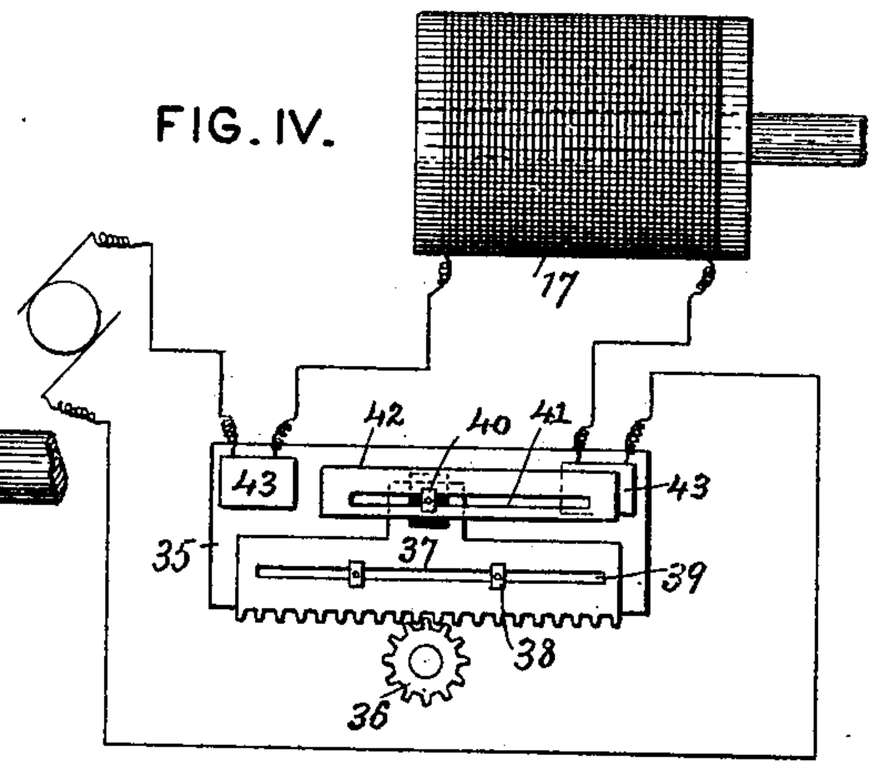


FIG. IV.



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UNITED STATES PATENT OFFICE.

HARVEY S. PARK, OF HENDERSON, KENTUCKY.

ELECTRO-MAGNETIC CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 353,880, dated December 7, 1886.

Application filed April 19, 1886. Serial No. 199,391. (No model.)

To all whom it may concern:

Be it known that I, HARVEY S. PARK, a citizen of the United States, residing at Henderson, in the county of Henderson and State of Kentucky, have invented certain new and useful Improvements in Electro-Magnetic Car-Brakes, of which the following is a specification.

My improvements relate to those car-brakes in which an electro-magnet, with its circuit and connecting devices, is employed for throwing in and out of gear connection between the brake-chain windlass and the car-wheel axle, whereby the latter is employed to effect the application of the brakes.

My improvements particularly consist in certain devices whereby when one electro-magnet is energized a disk on the brake-chain windlass will be alternately clamped, carried forward by the rotation of the car-wheel axle, and released; in the combination of such mechanism with means for holding the windlass to any position to which it has been driven by its connection with the car-wheel axle; in means for releasing the locking mechanism by electro-magnetic action when the brakes are to be released, and in means for automatically short-circuiting the braking-magnet when a desired maximum tension of brake application is reached.

In the accompanying drawings, Figure I is a side elevation of the improved electro-magnetic brake mechanism. Fig. II is a plan view of the brake-chain windlass, its associate mechanism, and the supporting-frame therefor. Fig. III is a rear elevation of the clamping mechanism, portions of the brake-chain windlass and car-wheel axle being shown in position. Fig. IV is a detail elevation of the automatic short-circuiting device.

1 1 are beams arranged longitudinally of the draft-timbers of the car, and supported from said draft-timbers by rods 2 2, which pass transversely through the beams 1. The brake-chain windlass 3 is journaled in the beams 1 at each end, and is connected to one end of the chain 4, whose other end operates the customary brake-lever.

5 is a car-wheel axle mounted in a truck in customary manner and carrying a cam, 6, which engages in a yoke, 7, bolted to plates or rods 8. Said plates or rods 8 have elongated bearing 9, through which passes the brake-chain windlass 3.

10 is a friction-disk keyed to the windlass 3 between the plates or rods 8.

11 is a dog pivoted on the bolt 12, which unites the plates 8 at top.

13 is a plate fixed between the plates or rods 8, and having a curve corresponding to that of the friction-disk 10.

It will now be seen that if the dog 11 be forced down on the upper edge of the disk 10 the plates 8 will rise until the said disk is firmly clamped upon the dog 11 and the curved plate 13; and when in this position each oscillation of said plates or rods 8, by means of the rotation of the cam 6 within the yoke 7, will carry the disk 10 round a slight distance, release it, and, returning, again seize it to carry it forward once more. The brake-chain is thus wound upon the windlass 3 and the brakes applied. The drawing down of the dog 11 against the edge of the friction-disk for accomplishing this purpose is effected by lever 14, connected by rod 15 to the core 16 of a hollow magnet or solenoid, 17. Said magnet or solenoid is mounted upon the beam 1 of the frame in the represented or any other suitable manner.

The following mechanism is employed for retaining the brakes to any desired tension of application, and as soon as they are applied by the mechanism just described.

18 is a ratchet-wheel keyed to the windlass 3.

19 20 are pawls pivoted on a lever, 21, which is itself pivoted at bottom to a bracket, 22, rigidly bolted to the cross-beam 23 of the frame. The pawls 19 20 are held against the surface of the ratchet-wheel 18 while the brakes are applied, or when the mechanism is in readiness for the application of the brakes, by means of a latch, 24, against a shoulder, 25, on which the lever 21 abuts at its upper end. When the brakes are to be released, the latch 24 is lifted from the end of lever 21. This is effected by means of magnets 26 and armatures 27, the latter carried by the latch 24. Between the armatures 27 and the shoulder 25 the latch 24 is supported upon a pivot, 28, carried by the bracket 22. Under the magnets 26 the cross-beam 23 is hollowed out to receive latches 29. These are pivoted at 30,

carry armatures 31, and are notched near their outer ends, as shown at 32, to receive pins or studs 33, projecting from the lever 21.

It will be seen that when the lever 21 is released by the latch 24, on the throwing of a current into magnets 26, the armatures 31 will be attracted by said magnets, and thus the latches 29 will be raised, so as to receive and retain pins or studs 33, thus holding the lever 21 in upright position and preventing the pawls 19 20 from engaging with the ratchet-wheel 18.

A pin, 34, projecting from the beam 1 under pawls 19 20, holds up said pawls when the latter are not in engagement with said ratchet-wheel 18, so that they are brought forward to the proper position for engagement with said ratchet-wheel as soon as the lever 21 is released by the latches 29 and allowed to fall forward by gravity. The latches 29 release the lever 21 as soon as the circuit through the magnets 26 is broken, and at the same time the latch 24, being released by the de-energizing of said magnets, it will fall in position to engage the upper end of the lever 21, and hold it in the position shown in Fig. I, thus retaining the pawls 19 20 in the position for locking the ratchet-wheel 18 should the brakes be again applied.

It will be seen that if at any time while the brakes are being applied current be diverted by the conductor or engineer from the magnet 17 the winding up of the brake-chain will cease and the brakes will be held at the tension already attained by the lever 21 and pawls 19 20, acting on the ratchet-wheel 18. In addition, however, to rendering the braking mechanism controllable at the will of the engineer or conductor, I have provided means for automatically short-circuiting the magnet 17 when any set degree of tension of the brakes is reached. The mechanism for this purpose is shown in Figs. II and IV, and is contained within a case, 35, fixed to one of the beams 1 of the frame. 36 is a pinion carried by the end of the windlass 3 and engaging a rack, 37. Said rack is guided by pins 38 and slot 39, and has connected to it by a similar pin, 40, and slot 41, a metallic bridge-piece, 42. The bridge 42 is insulated from and may be fixed at any point desired relatively to the rack 37 by adjusting the pin 40 in the slot 41. 43 43 are contact-plates fixed to the side of the case 35, and at such distance apart as to be capable of being united by the bridge 42. The circuit to the magnet 17 passes through one of the plates 43, thence through the magnet, thence through the other plate 43, and back to the generator, as shown in Fig. IV. It will now be seen that if the pinion 36 be rotated by the windlass 3 it will carry forward the rack 37 until the bridge 42 unites the contact-plates 43, and at that instant the magnet 17 will be short-circuited and the increase of tension on the brakes will cease, the brakes, however, being locked at the tension already attained.

The position of the parts shown in Fig. IV is for convenience of representation only, the proper relation of the parts being gained from Fig. II.

Having thus described my invention, the following is what I claim as new therein, and desire to secure by Letters Patent:

1. In an electro-magnetic car-brake, in combination with a car-wheel axle, brake-chain and windlass therefor, a disk fixed to said windlass, clamping members arranged to engage with said disk, an operating-rod and armature connected to said clamping members, an electro-magnet or solenoid, a circuit including said magnet or solenoid, a ratchet-wheel, also connected to said windlass, and locking-pawls adapted to engage with said ratchet-wheel, substantially as and for the purpose set forth.

2. The mechanism for operating a brake-chain windlass from a car-wheel axle, consisting of the following elements: an eccentric on the axle, plates or rods having a yoke occupied by said eccentric, a disk on the brake-chain windlass, a fixed clamping member and a pivoted clamping member on opposite sides of said disk and carried by said plates or rods, slotted bearings in said plates or rods for receiving the windlass, a hollow electro-magnet or solenoid, and a core or armature therefor having connection with said pivoted clamping member, substantially as and for the purpose set forth.

3. In combination with a brake-chain and windlass, a ratchet-wheel connected to said windlass, pawls engaging with said ratchet-wheel, a lever whereto said pawls are pivoted, a latch having means of engagement with said lever and carrying an armature or core, and an electro-magnet or solenoid and circuit, said magnet or solenoid being arranged in proximity to said armature or core, substantially as and for the purpose set forth.

4. In combination with a brake-chain and windlass, a ratchet-wheel connected with said windlass, locking-pawls adapted to engage with said ratchet-wheel, a lever whereto said pawls are pivoted, latches adapted to engage said lever when in position away from said ratchet-wheel, armatures or cores on said latches, and electro-magnets or solenoids and circuit arranged in proximity to said armatures or cores, substantially as and for the purpose set forth.

5. In combination with brake-chain-winding mechanism and a lever for locking the same in desired position, latches respectively adapted to hold said lever at its two extreme positions, armatures or cores on said latches, and electro-magnets or solenoids and circuit arranged in proximity to said armatures or cores for operating said latches simultaneously, substantially as and for the purpose set forth.

6. In an electro-magnetic car-brake, in combination with a brake-chain and windlass, an electro-magnet or solenoid and circuit, a core

or armature for said magnet or solenoid, a car-wheel axle, and means operated by said electro-magnet or solenoid and armature or core for connecting said car-wheel axle and brake-chain windlass, a pinion on said windlass, a rack-bar actuated by said pinion, a metallic bridge connected with said rack-bar, and contact-plates arranged in the path of said bridge and in circuit with the generator and braking-magnet, substantially as and for the purpose set forth.

7. In an electro-magnetic car-brake, in combination with a magnet or solenoid and circuit for operating the connection between the car-wheel axle and the brake-chain windlass, contact-plates in said circuit on opposite sides of the electro-magnet, and a bridge operated by the brake-chain windlass and adjustable in relation thereto, substantially as and for the purpose set forth.

HARVEY S. PARK.

Witnesses:
E. A. PARK,
JAMES MCLAUGHLIN.