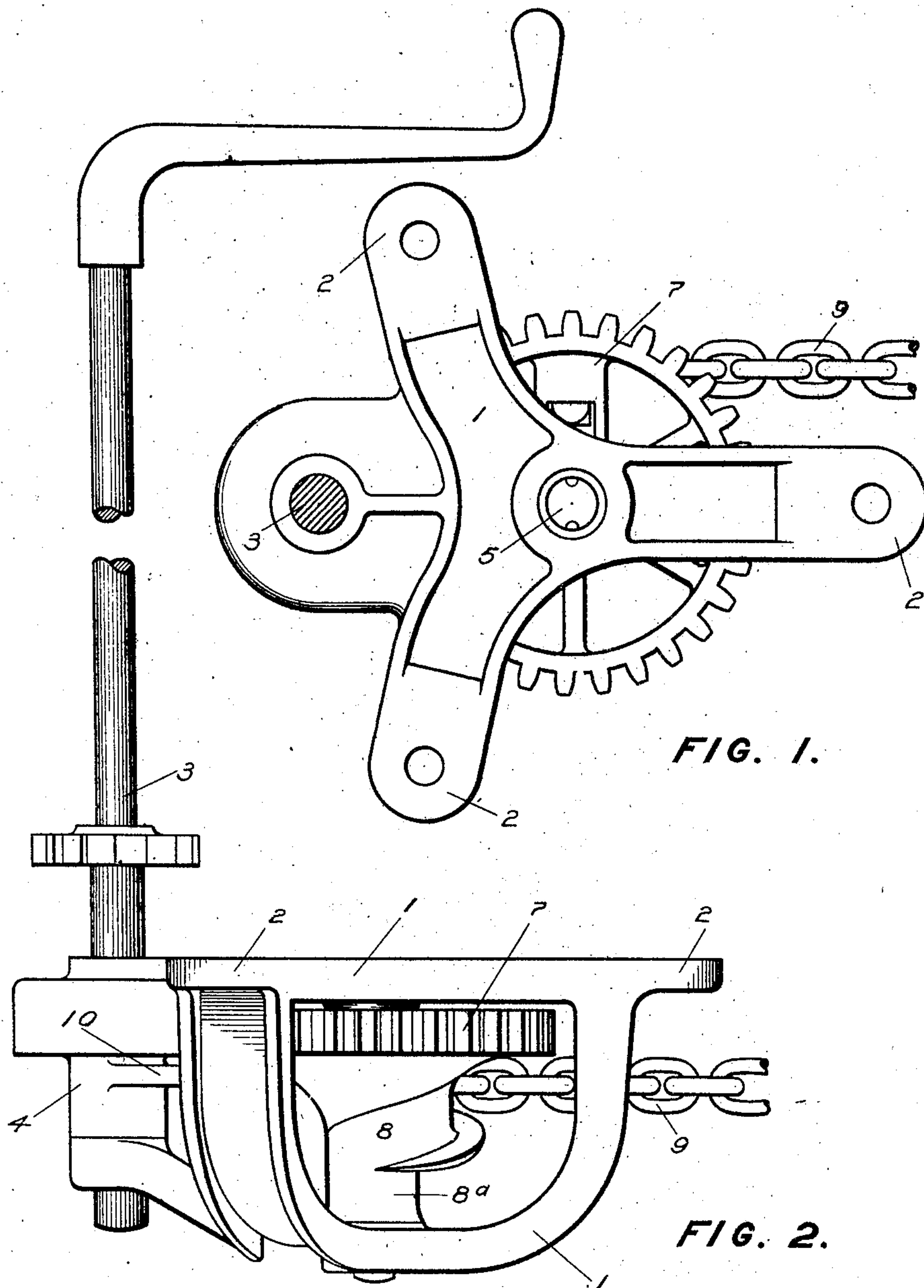


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MECHANISM FOR OPERATING CAR BRAKES.  
APPLICATION FILED JUNE 1, 1908.

925,466.

Patented June 22, 1909.  
2 SHEETS—SHEET 1.



WITNESSES

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INVENTOR

*Henry Dixon*  
By *H. Dixon*  
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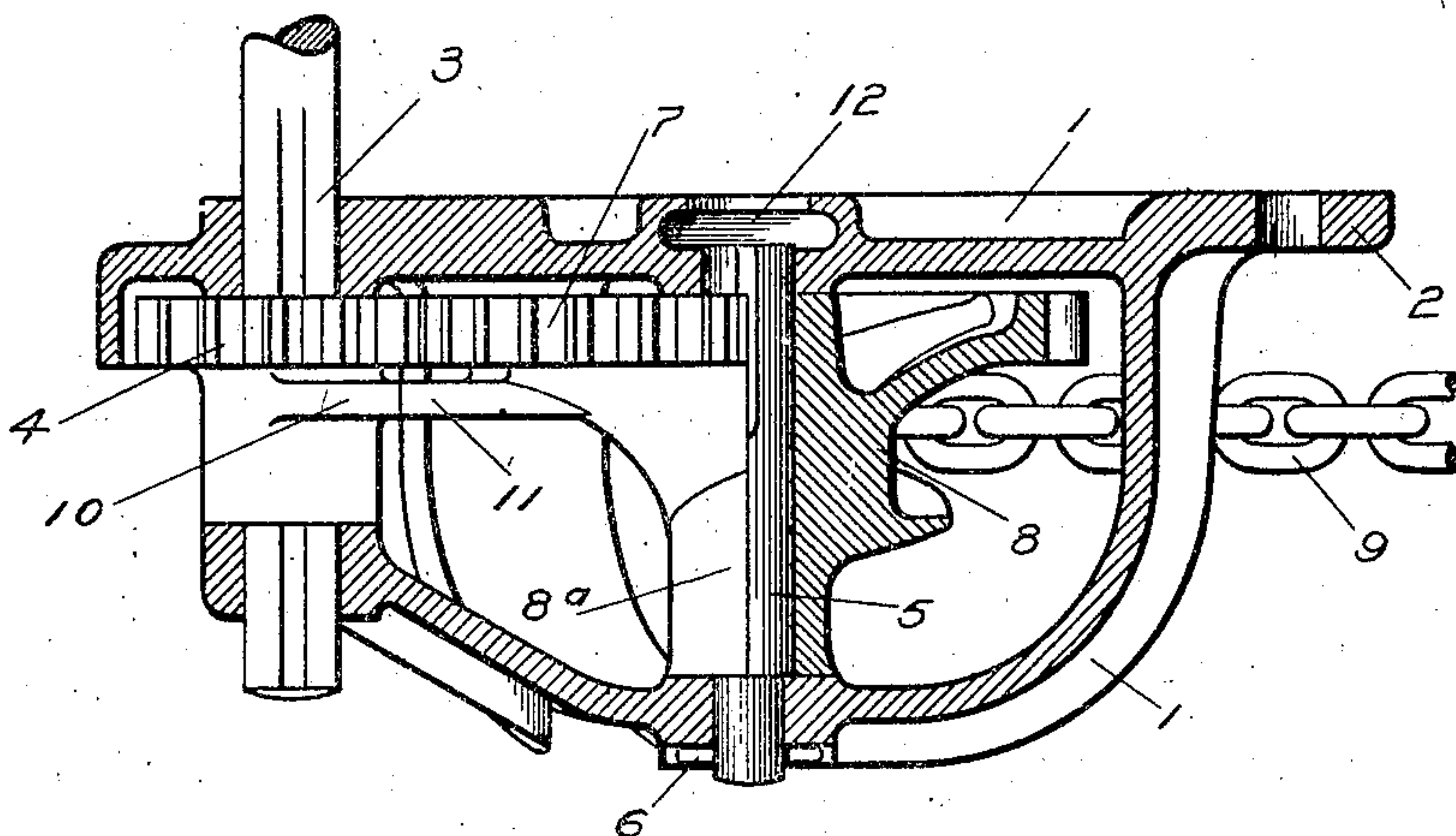


FIG. 3.

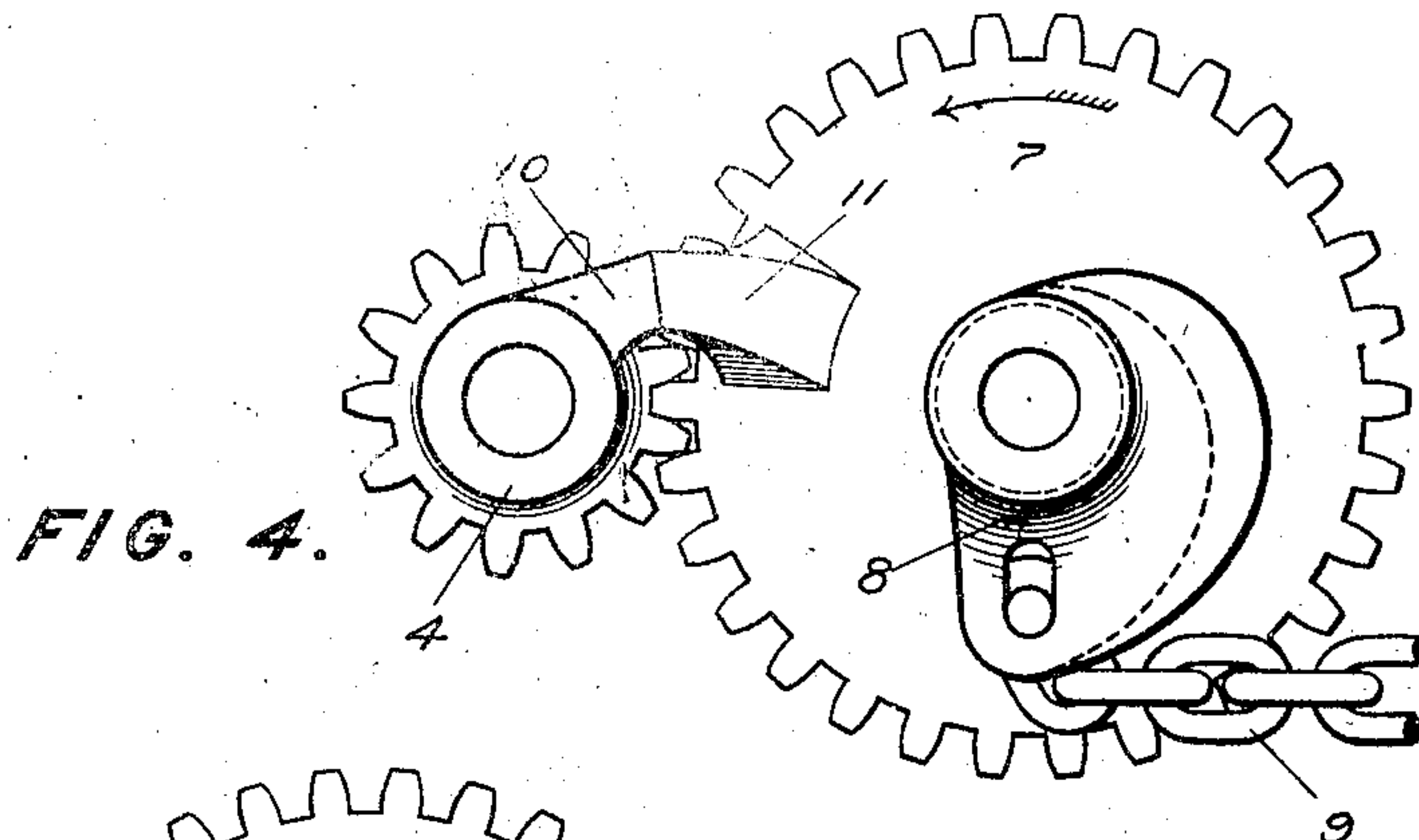


FIG. 4.

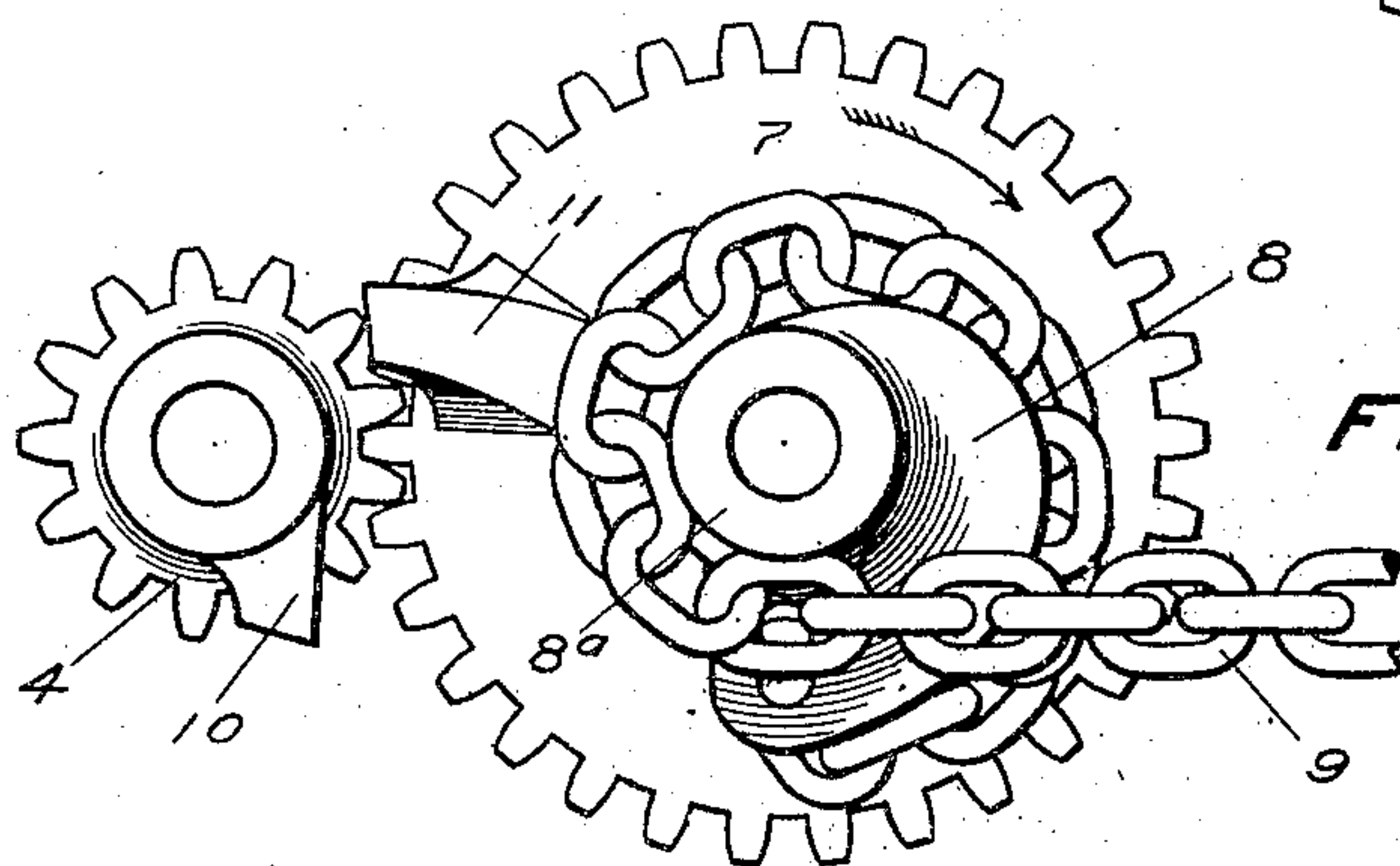


FIG. 5.

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# UNITED STATES PATENT OFFICE.

HENRY DIXON, OF BALMY BEACH, ONTARIO, CANADA, ASSIGNOR TO JOHN LANGFORD  
PEACOCK, OF BUFFALO, NEW YORK.

## MECHANISM FOR OPERATING CAR-BRAKES.

No. 925,466.

Specification of Letters Patent.

Patented June 22, 1909.

Application filed June 1, 1908. Serial No. 435,914.

*To all whom it may concern:*

Be it known that I, HENRY DIXON, of Balmy Beach, in the county of York and Province of Ontario, Canada, have invented certain new and useful Improvements in Mechanism for Operating Car-Brakes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

The present invention relates to improvements in brake-operating mechanism for vehicles, and particularly to that class in which the brake-post or handle operates with a variable leverage through the medium of a compensating device, during the application of the brake; and the object of the invention is to make more efficient the present hand-brake system of electrically propelled or trolley cars, and to enable the operator to apply the brake with sufficient force to cause cessation of movement in a comparatively short distance, with a minimum expenditure of energy, and to eliminate the objectionable feature of additional turns of the brake-post over and above that found practical for rapid braking of cars.

Characteristic of the present invention is the embodiment of a stop-motion device, whereby the lost motion due to backlash is eliminated in the brake-operating mechanism and a fixed or positive stop provided, to limit the rotation of the operating elements in the direction of unwinding, while within the range of the capacity of the chain or cable drum its rotation in the direction of winding is unimpeded.

The invention consists in part of the incorporation of a brake-actuating spiral drum, constructed in such a manner as to set up a differential leverage of increasing magnitude relatively proportionate to the applied braking force, during the rotation of the initial power receiving brake-post, and certain details of construction, as hereinafter set forth and illustrated in the accompanying drawings, in which similar figures of reference refer to like parts throughout.

Figures 1 and 2 are views in top plan and side elevation, respectively, of the improved mechanism for operating car brakes. Fig. 3 is a vertical longitudinal sectional view of the device shown in Figs. 1 and 2, with a portion of the actuating elements shown in elevation; and Figs. 4 and 5 are inverted plan views of

the pinion and gear showing the relative positions of the contact arms of the stop-motion device.

The frame or bracket 1 is preferably cast in one piece and provided with a series of lateral lugs 2, three of which are sufficient and found to be advantageous in insuring at all times a true and rigid support. In some instances, it is found essential to journal the primal actuating medium or brake-post on the outside of the dash, and with this end in view, provision is made in the construction of the frame to admit of its projecting beyond the front of the dash when bolted or otherwise secured to the underside of the platform of the car. The present brake-post and its appurtenances can be employed with but a slight modification of its lower extremity. Within the frame 1 are pivotally mounted the actuating elements of the brake-operating device.

The lower extremity of the brake-post 3 is journaled in the upper and lower portions of the frame and serves as the spindle for the pinion 4, carried fast thereon. In alignment with and parallel of the spindle or brake-post 3 is a vertically disposed stud 5, terminally fixed in the upper and lower portions of the frame and secured in a manner to insure against its displacement, for which purpose there is formed a shoulder on the lower end of the stud, and below said shoulder and subjacent to the frame provision is made for the reception of the cotter pin 6, as shown.

Pivoted upon the stud 5 and adapted to revolve freely thereon is a spur-gear 7, in mesh with the aforesaid pinion 4 and integral with the spiral brake-chain drum 8, also revolving thereon. The ratio of the spur-gear 7 and pinion 4 is relatively proportionate to the capacity of the drum and the leverage desired during the angular movement of the brake-post 3. Directly above the stud 5 the upper portion of the frame surrounding the same is recessed to form a chamber 12, which serves as a reservoir for lubricant for the parts which rotate upon the aforesaid stud. The drum 8 upon which the brake-chain 9 is wound is a tapering spiral adapted to merge into a cylindrical portion 8<sup>a</sup>, as shown.

The efficiency of a device of this nature is in a great measure dependent upon the provision made therein for taking up the slack of the brake-actuating mechanism of the car with the lowest practical turning moment



per unit length of chain; but in order to attain the highest efficiency it is essential to eliminate the lost-motion due to backlash in the brake-operating device, in part the characteristic feature set forth in the preamble of this specification.

By referring to Figs. 4 and 5 it will be seen that, commencing at the greatest radius of the drum 8, at which point the chain 9 is made fast, the slack of the brake-chain is rapidly taken up by the major portion of the drum gradually diminishing with an increasing purchase, the maximum being attained when that portion of the drum 8<sup>a</sup> is reached wherein the diameter ceases to decrease. Upon the latter or cylindrical part of the drum may be wound additional chain while retaining the maximum leverage and without further increasing the turning moment per unit length of chain. Subjacent to the plane of the train of gears are radial arms 10 and 11, which project sufficiently beyond the pitch circles to cause their extremities to engage each other and serve as a limiting-stop to impede further movement of the aforesaid gears. These radial or contact arms 10 and 11 are integral with the pinion 4 and spur-gear 7, respectively, and are adapted to meet in a fixed position relatively to that of the drum 8, as shown in Fig. 4, and arrest further movement in the direction of unwinding when the chain ceases to lap the drum. In this position or point of rest the brake is fully released. Further movement in the direction indicated by arrow in Fig. 4, would yield unnecessary slack and materially affect in operation the efficiency of the device. Within the range of the proportions adaptable for the gears of this device, the ratio of their angular velocities is such that, from the point of rest and during the application of the brake, the drum may in the course of winding the chain thereon, be rotated (in the direction indicated by arrow in Fig. 5,) in excess of its capacity, before the radial arms again engage each other. In the present device, the usual or less expensive form of bearing is adapted; but should it be found desirable to reduce the friction of the operating elements to a minimum, and particularly the parts subjected to a forceful strain, it is only a mechanical expedient to substitute therefor a suitable form of roller-bearing. The latter form of bearing is preferable when the cost of construction is not an important consideration.

Having described my invention, what I claim as new and desire to secure by Letters-Patent, is:—

1. In a brake-actuating mechanism, the combination with a gear and its actuating pinion, of rotatable contact pieces interact-

ing with said gear and pinion to form a stop-motion device, a brake-actuating drum interacting with said gear, and a brake-post adapted to operate said gear through the medium of said pinion.

2. In a brake-actuating mechanism, the combination with a gear and its actuating pinion, of interacting contact arms rotatable with said gear and pinion to form a stop-motion device, a brake-chain drum interacting with said gear and adapted to operate with a variable leverage, and a brake-post adapted to operate said gear through the medium of said pinion.

3. In a brake-actuating mechanism, the combination with a gear and its actuating pinion, of rotatable contact arms interacting with said gear and pinion to form a stop-motion device, a brake-actuating spiral drum integral with said gear and adapted to operate with a variable leverage, and a brake-post interacting with said pinion, for the purpose hereinbefore set forth.

4. In a brake-actuating mechanism, the combination with a pinion having a contact arm, of a brake-actuating drum and gear having a like arm, said arms adapted to engage each other and limit the movement of the aforesaid drum in the direction of unwinding, and a brake-post adapted to operate said gear through the medium of said pinion.

5. In a brake-actuating mechanism, the combination with a brake-actuating drum and gear, of a radial arm an integral part of said drum and gear, a pinion in mesh with said gear and having a like radial arm, said arms adapted to engage each other and limit the movement of the aforesaid drum in the direction of unwinding, and a brake-post adapted to operate said gear through the medium of said pinion, for the purpose hereinbefore set forth.

6. In a brake-actuating mechanism, the combination with a pinion having a radial contact arm, of a brake-actuating spiral drum and gear having a like arm, said arms adapted to engage each other and form a stop-motion device, a brake-chain operating with a variable leverage from the spiral and concentric periphery of said drum, and a brake-post adapted to operate said gear through the medium of said pinion, substantially as shown and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY DIXON.

Witnesses:

S. R. EARLE,  
C. W. AVERY.