No. 754,603. PATENTED MAR. 15, 1904.

J. L. PEACOCK.

MECHANISM FOR OPERATING CAR BRAKES.

APPLICATION FILED SEPT. 3, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

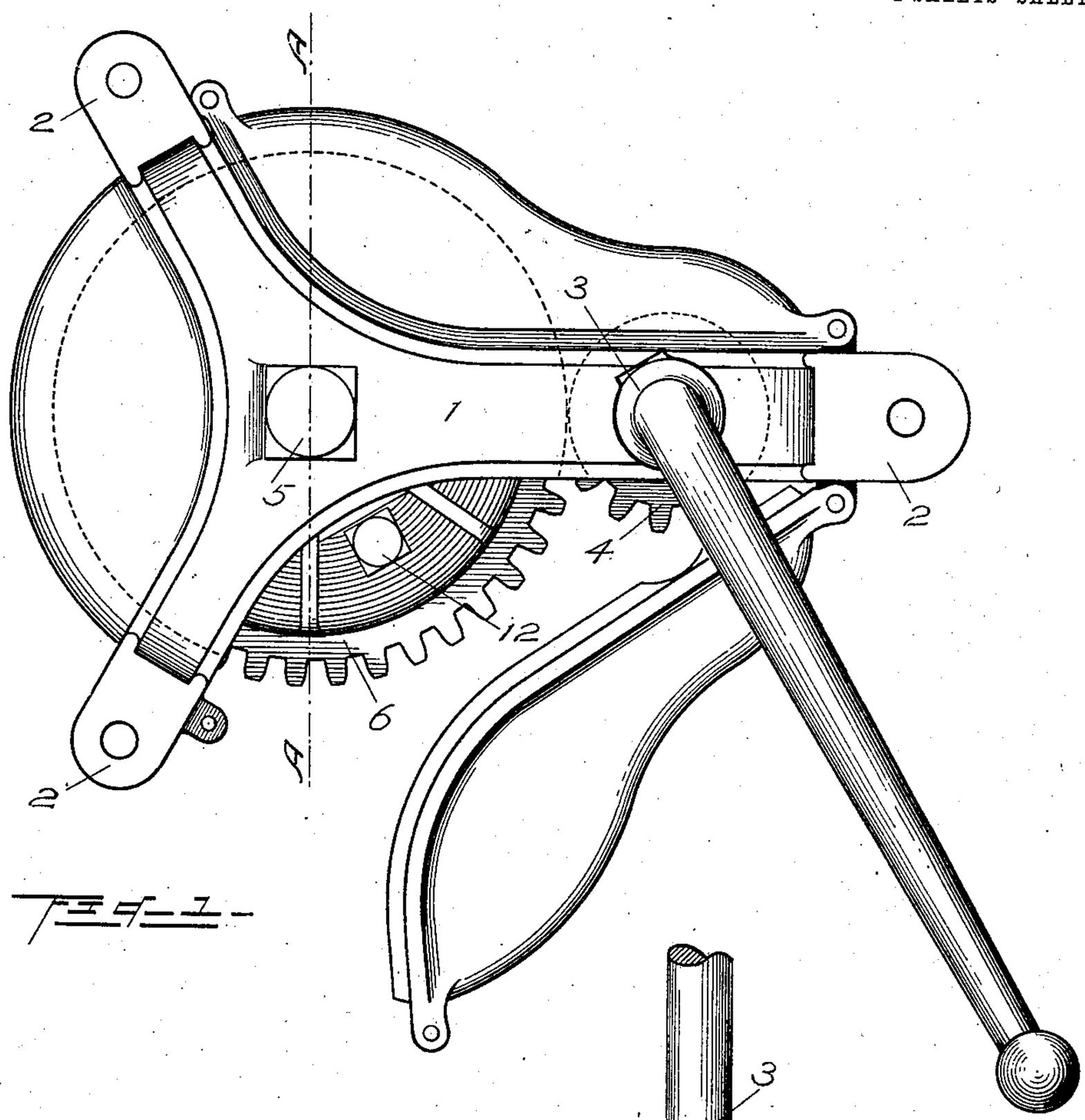

FIG. 1.

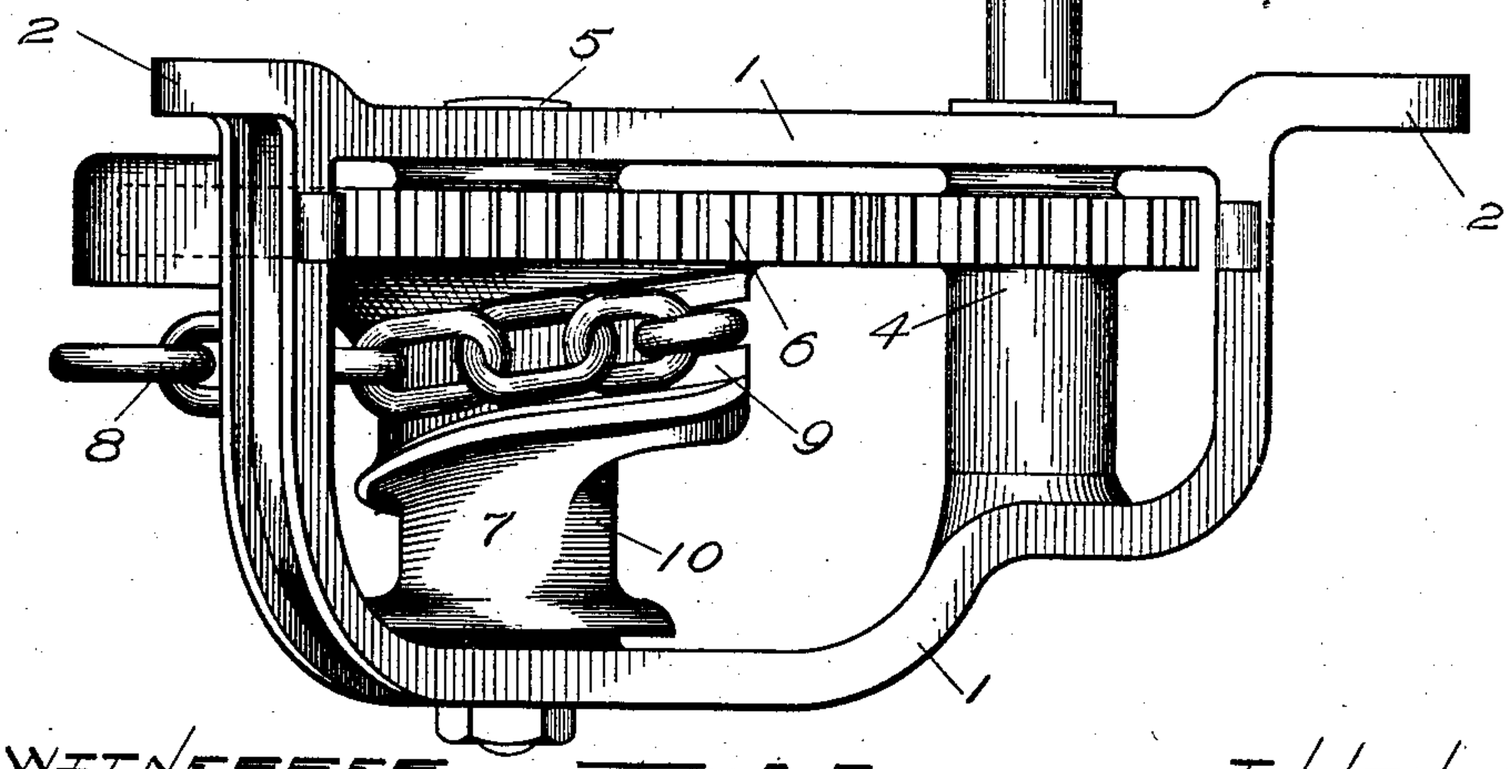

FIG. 2.

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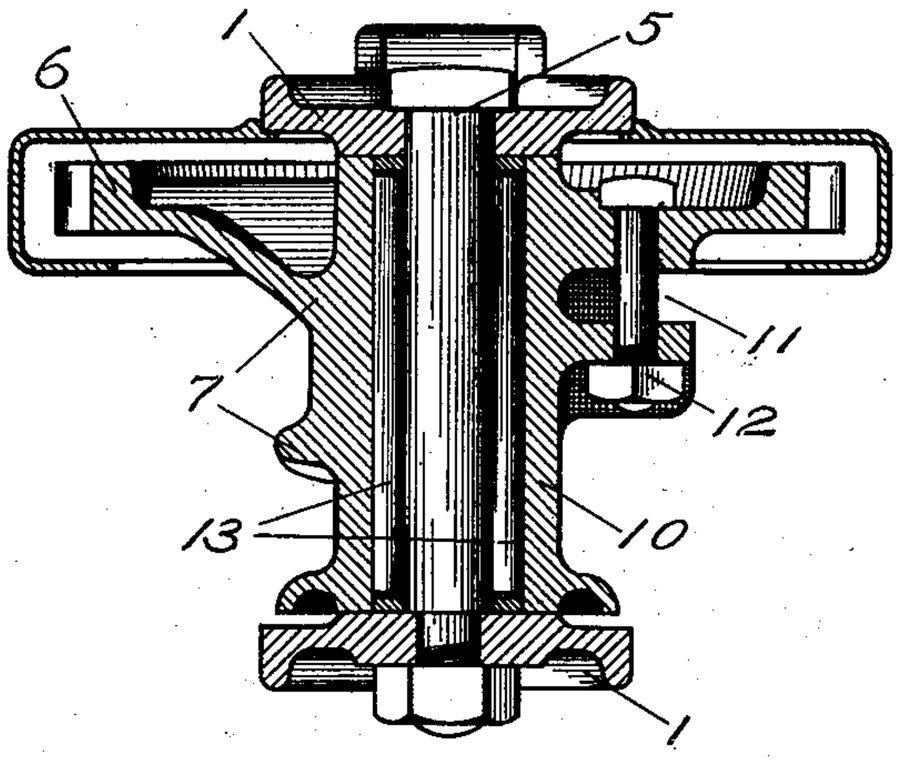

FIG. 3.

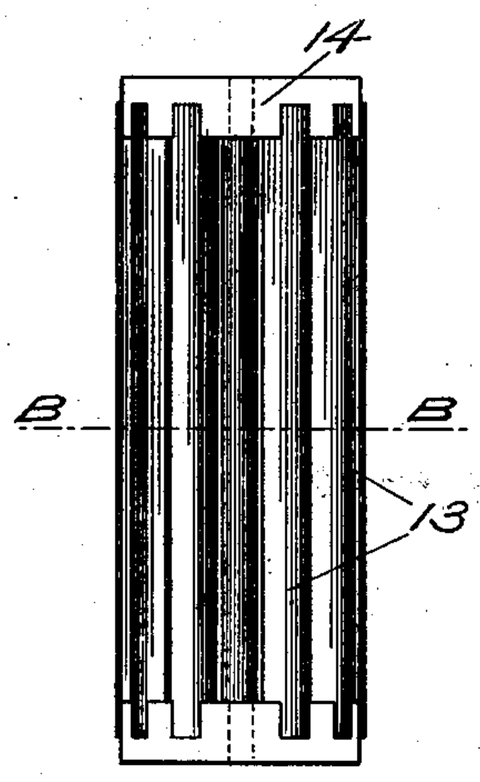

FIG. 4.

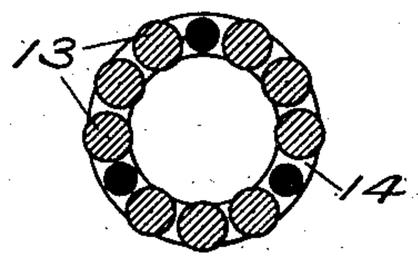

FIG. 5.

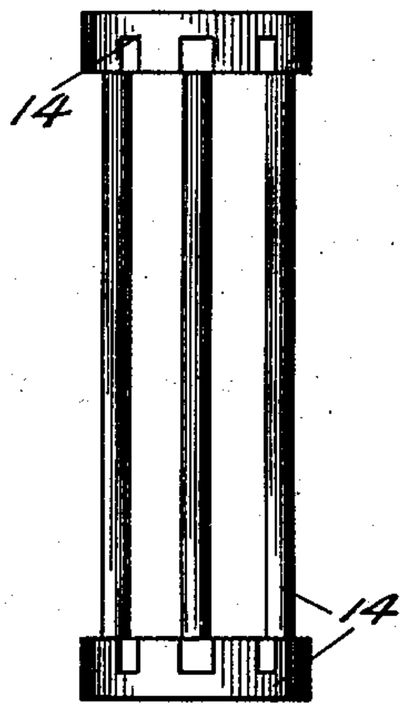

FIG. 6.

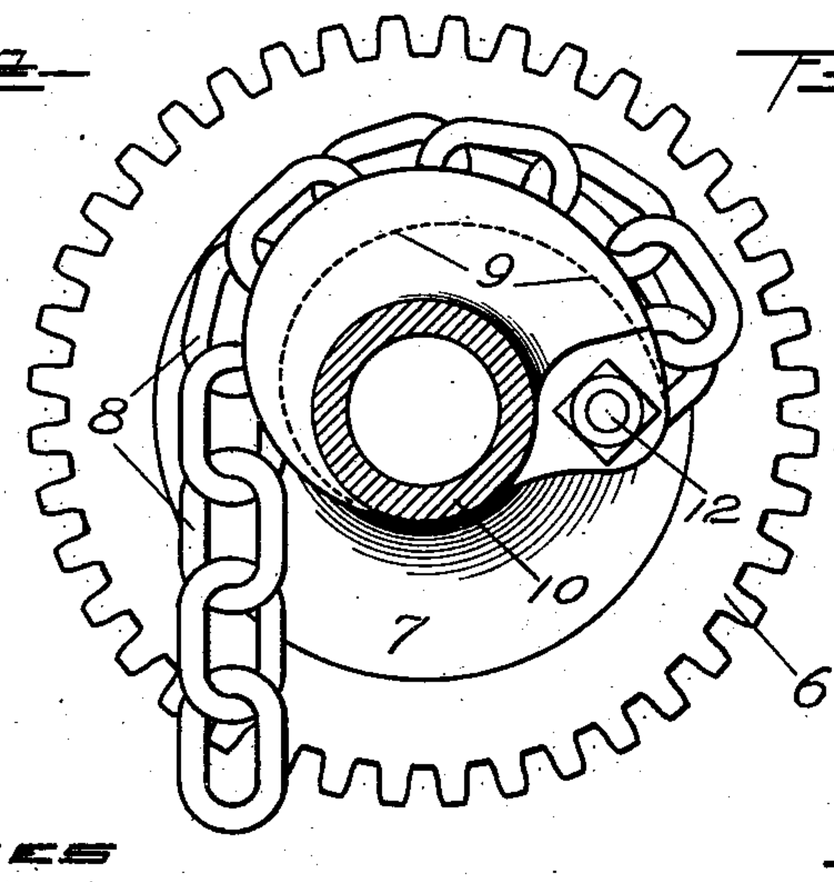

FIG. 7.

WITNESSES

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No. 754,603. Patented March 15, 1904.

UNITED STATES PATENT OFFICE.

JOHN LANGFORD PEACOCK, OF BUFFALO, NEW YORK.

MECHANISM FOR OPERATING CAR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 754,603, dated March 15, 1904.

Application filed September 3, 1903. Serial No. 171,837. (No model.)

To all whom it may concern:

Be it known that I, JOHN LANGFORD PEACOCK, of the city of Buffalo, in the county of Erie and State of New York, 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 an improved brake-operating mechanism general in its application, and particularly a valuable adjunct to the present hand-brake of electrically-propelled or trolley cars.

The characteristic feature of the present invention is to embody in a compensating device a spiral form of chain or cable drum operatively connected with the primal operating medium, and has for its object to take up rapidly the slack of the brake mechanism of the car with a minimum angular movement of the brake-handle, to utilize with advantage the saving thus made, to more effectually apply with a gradually-increasing force the brake-shoe to the wheels by a relatively proportionate increase of the angular movement of the brake-handle, and to maintain a maximum braking force for any desirable degree of the major portion of the said angular movement of the brake-handle. By this means the augmented braking force is sufficient to cause cessation of movement in a comparatively short distance with a minimum expenditure of manual energy and without incurring the objectionable feature of additional turns of the brake-handle over and above that found practical for rapid braking of cars. Appliances have been devised with a similar object in view to make more perfect the hand-brake mechanism; but the means employed, particularly the eccentrically-pivoted chain or cable drum, will not permit of an excess in more than half a revolution without curtailing the advantage derived from the eccentric or analogous device. It must be borne in mind that perfection in a brake device permits of a variation in the length of chain wound upon the drum in operating the brake, while maintaining a uniform braking force. Owing to the constant wearing away of the brake-shoes and the intermittent variation of the mechanism due to climatic changes, the length of chain wound upon the drum is a variable quantity, and the maximum braking force cannot be maintained without recourse to an auxiliary adjustment, which is is not a desideratum.

The invention consists in part of the application of roller-bearings, particularly in the instance of the chain or cable drum, and certain details of construction, as hereinafter more fully described, reference being had to the accompanying drawings, forming part thereof, in which similar figures of reference refer to like parts throughout.

Figure 1 is a top plan view of the improved brake-operating mechanism with a portion of the casing removed to more clearly show the operating elements. Fig. 2 is a side elevation of Fig. 1 with the detachable portions of the casing entirely removed. Fig. 3 is a cross-sectional view on the line A to A of Fig. 1. Fig. 4 is a view in detail of the roller-bearing. Fig. 5 is a cross-sectional view on the line B to B of Fig. 4. Fig. 6 is a detail view of the roller-bearing, showing the cage with the rolls removed; and Fig. 7 is an inverted plan view of the spiral drum, showing the contour of the same and the integral gear forming part thereof.

The actuating elements of the brake-operating device are carried in a substantial frame and inclosed, in as far as is practical, by a casing, a portion of which is detachable, as shown. The frame 1 is of the skeleton type and preferably cast in one piece and provided with lateral lugs 2, three of which are found most desirable. The advantages derived from supporting the device at three points is obvious, insuring at all times a true and rigid support without producing any undue strain in the frame of the device when bolted or otherwise secured to the under side of the platform. The present brake post or spindle and its appurtenances can be employed with but few changes and serve as the actuating medium for the brake-operating device.

The lower extremity of the brake-post 3

passes downwardly through the upper and lower portions of the frame 1 and is journaled therein and serves as the spindle for the pinion 4, carried fast thereon by a key or feather, preferably the latter, allowing the brake-post to be readily withdrawn or inserted.

In alinement with and parallel of the aforesaid spindle 3 is a vertically-disposed stud 5, terminally fixed in the upper and lower portions of the frame 1 and secured in a manner to insure against its displacement, for which purpose the enlarged head of said stud is on the upper side of said frame, as shown.

Carried upon the stud 5 and adapted to revolve freely thereon is a spur-gear 6, in mesh with the aforesaid pinion 4 and integral with the brake-chain drum 7, also carried thereon. The ratio of the spur-gear 6 and pinion 4 is relatively proportionate to the length of chain wound upon the drum 7 in operating the brake.

By referring to Fig. 7 it will be seen that, broadly speaking, the drum 7 has a spiral periphery, upon which the brake-chain 8 is wound; but owing to the prevailing conditions regulating the operation of a device of this nature it is essential for to obtain the highest efficiency to modify the spiral form of drum in such a manner that the contour of the major portion 9 resembles a parabola merging in the minor or cylindrical portion 10. Commencing at the greatest radius of the drum, at which point the chain or cable 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 the cylindrical portion of the drum is reached. The minor or cylindrical portion of the drum remains to take up any additional chain without further increasing the turning moment per unit length of chain, in part the advantages alluded to in the preamble of this specification.

The manner of attaching the brake-chain to the drum is simple and efficient, permitting readily the attaching and detaching of the chain. At the greatest radius of the drum is formed in the periphery a pocket or recess 11 to receive the terminal link of the brake-chain 8, through which passes the bolt 12, as shown.

By the adaptation of roller-bearings, particularly in the instance of the brake-chain drum, the portion of the device subjected to a forceful strain, the friction is reduced to a minimum. Any well-known form of roller-bearing that will fulfil the requirements in this instance can be employed. Illustrated by Figs. 4, 5, and 6 is a simple and efficient roller-bearing comprising a series of cylindrical rolls 13, retained by a cage 14, consisting of two annular collars supported apart by studs, as shown, and provided with recesses for the reception of the rolls.

Although advantageous, the adaptation of roller-bearings is not an indispensable feature of this invention. Any other form of bearing may be substituted without departing from the spirit of the invention.

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

1. In a brake-actuating device, the combination with the brake-post, of a pinion on the lower end of said post, a gear in mesh with said pinion and integral with a spiral brake-chain drum adapted to operate with a variable leverage, said spiral tapering downward to a cylindrical part and being in its broadest portion of parabolic curve, substantially as set forth.

2. In a brake-actuating device, the combination of roller-bearings with the brake-post, a pinion on the lower end of said post, a brake-actuating drum comprising an integral spiral and concentric periphery, a gear in mesh with said pinion and operating said drum, and a brake-chain attached to said drum and adapted to operate with a variable leverage, substantially as and for the purpose set forth.

3. In a brake-actuating device, the combination of roller-bearings with the brake-actuating drum and gear, an integral spiral and concentric periphery, a brake-chain attached to said drum and adapted to operate from the said spiral and concentric periphery with a variable leverage, and a pinion in mesh with said gear, and actuated by the brake-post, substantially as and for the purpose set forth.

4. In a brake-actuating device, the combination with a brake-actuating spiral drum and gear, of a recess formed in the periphery at the greatest diameter of said drum to receive the terminal link of the brake-chain, and a bolt adapted to pass through said link and fasten it to said spiral drum, substantially as shown and for the purpose set forth.

5. In a brake-actuating device, the combination with roller-bearings, of a brake-actuating spiral drum and gear, a pinion in mesh with said gear and carried on the lower end of the brake-post, and a brake-chain operating with a variable leverage from the spiral and concentric periphery of said drum, substantially as shown and for the purpose set forth.

6. In a brake-operating device, the combination of a brake-actuating spiral drum and gear with means for turning the said gear and a brake-chain operating with variable leverage from the said spiral and cylindrical parts of the drum; the said spiral part diminishing in diameter from the said gear and being of parabolic curve in its largest part, substantially as set forth.

7. In brake-actuating mechanism, a single piece, consisting of a gear-wheel, a parabolic spiral part, tapering therefrom, and a cylin-

drical part at the end of the latter, in combination with a chain, winding from the broadest portion of said spiral part, and a pinion, carried by the brake-post, which meshes with the said gear-wheel, to turn the same substantially as set forth.

In testimony whereof I sign this specification, in the presence of two witnesses, this 26th day of August, 1903.

JOHN LANGFORD PEACOCK.

Witnesses:
CHARLES L. LAWRIE,
H. DIXON.