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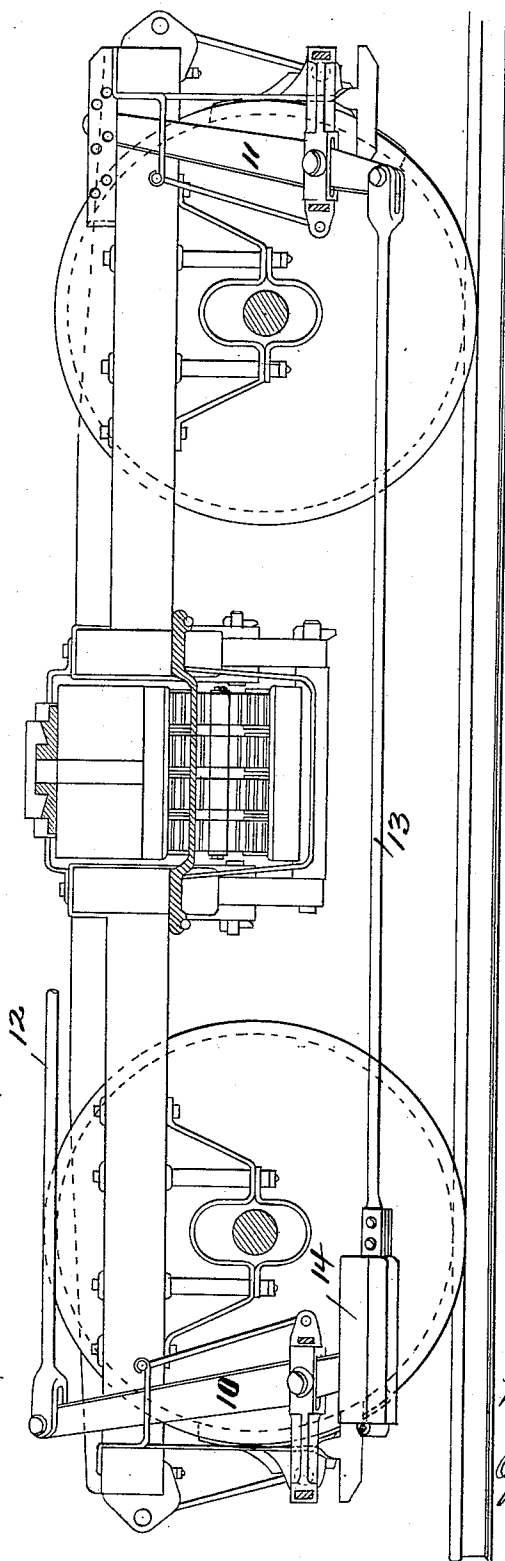
4 Sheets—Sheet 1.

W. H. MARSHALL.
SLACK ADJUSTER FOR CARS.

No. 484,858.

Patented Oct. 25, 1892.

Fig. 1.



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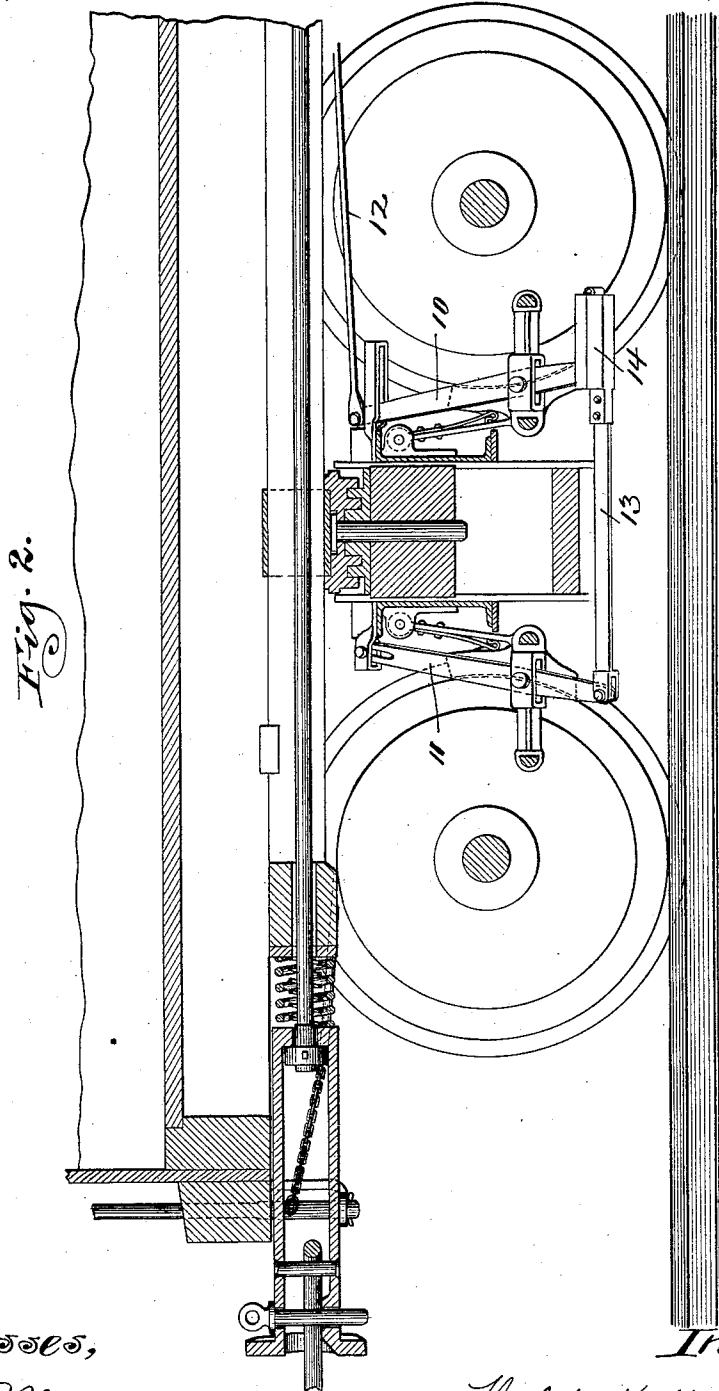
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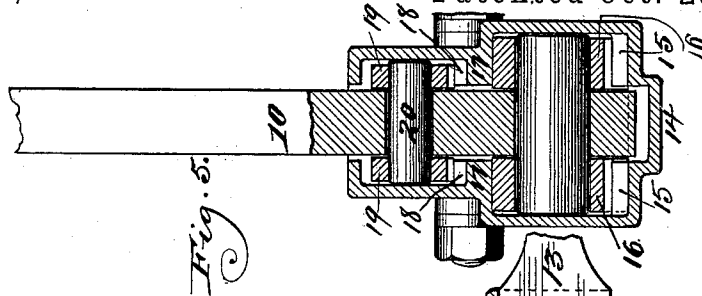


Fig. 5.

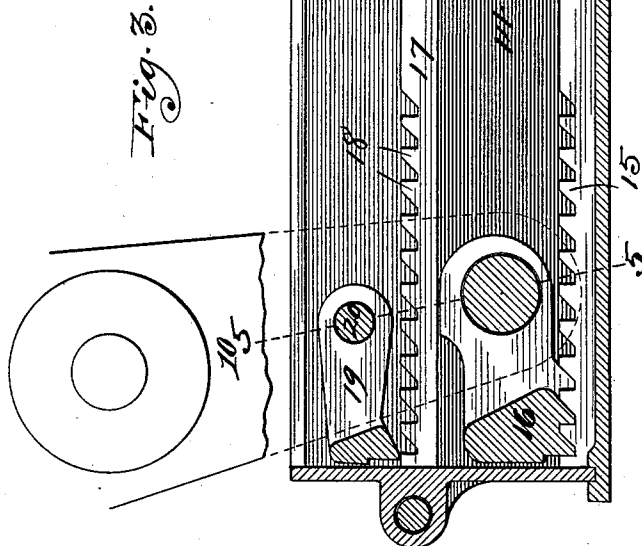


Fig. 3.

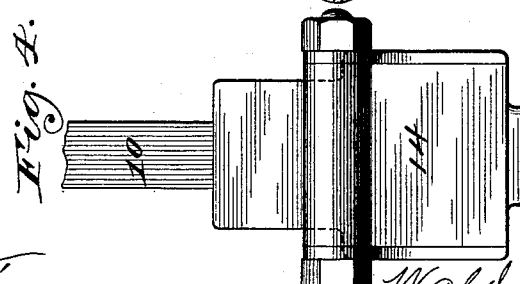


Fig. 4.

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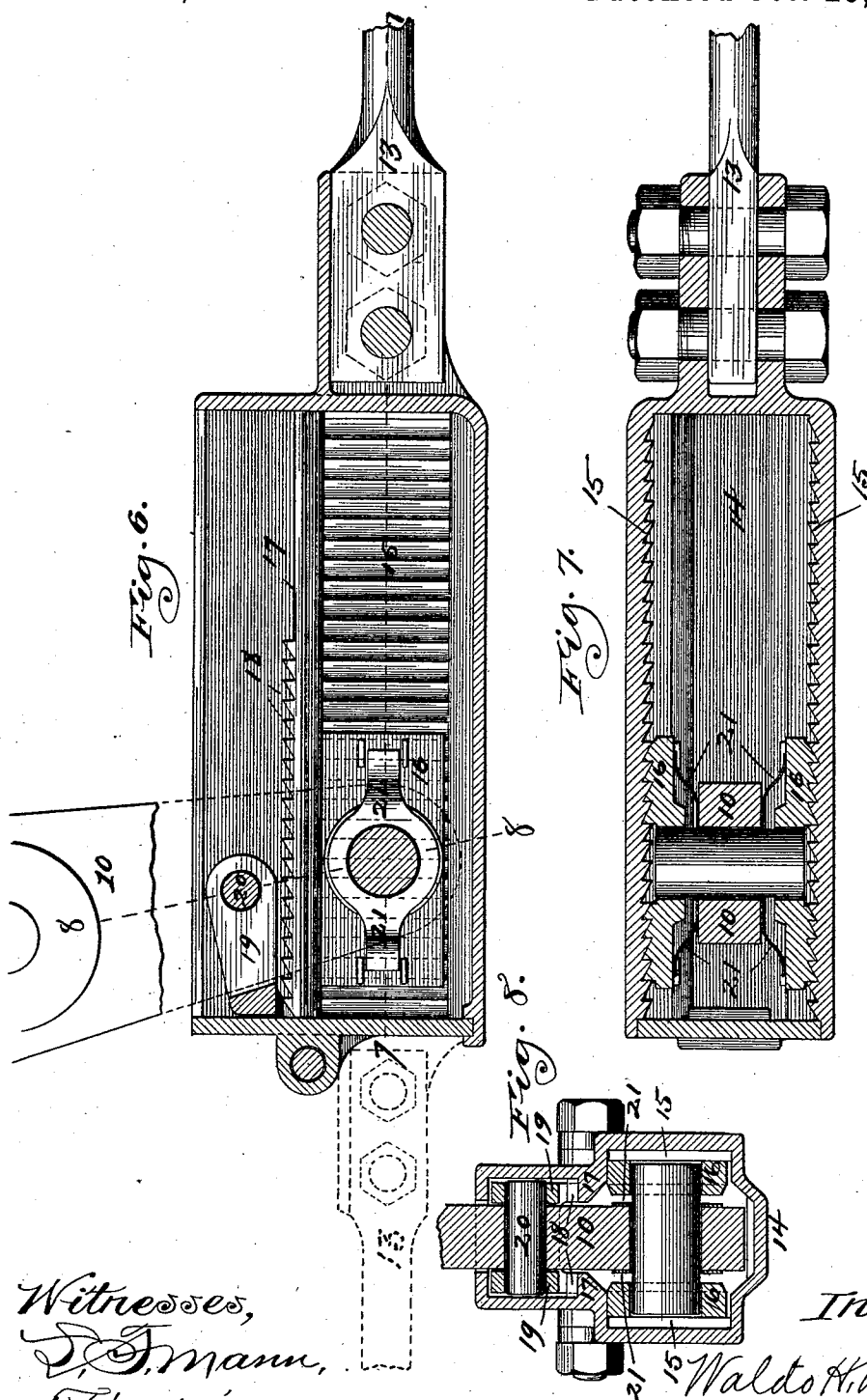
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UNITED STATES PATENT OFFICE.

WALDO H. MARSHALL, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE CONSOLIDATED BRAKE ADJUSTER COMPANY, OF SAME PLACE.

SLACK-ADJUSTER FOR CARS.

SPECIFICATION forming part of Letters Patent No. 484,858, dated October 25, 1892.

Application filed November 16, 1891. Serial No. 412,066. (No model.)

To all whom it may concern:

Be it known that I, WALDO H. MARSHALL, of Chicago, Illinois, have invented certain new and useful Improvements in Slack-Adjusters for Car-Brakes, of which the following is a specification.

My invention relates to certain improvements in means for automatically taking up the slack of car-brakes, so as to compensate for wear of the brake-shoes; and my invention consists in certain devices and combinations of devices for the efficient accomplishment of these ends, as hereinafter described, but more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a car-truck having the brake applied to the outside of the wheels. Fig. 2 is a sectional elevation showing the invention applied to an inside brake. Fig. 3 is a longitudinal sectional elevation through a box or casing containing the take-up device. Fig. 4 is a front end elevation thereof. Fig. 5 is a transverse sectional elevation on the line 5 5 of Fig. 3. Fig. 6 is a longitudinal sectional elevation showing a modification of the slack-adjusting devices. Fig. 7 is a horizontal section thereof on the line 7 7 of Fig. 6, and Fig. 8 is a transverse sectional elevation taken on the line 8 8 of Fig. 6.

Numerous devices for automatically taking up the slack to compensate for the wear of brake-shoes have been patented, and some of such devices have gone into use.

It is my object to simplify the construction of such devices so far as consistent with efficient operation. In carrying out this invention I preferably apply the take-up devices at or about the pivotal connection of the live-lever and the lower brake-rod of the truck, and such take-up devices include, generally stated, a box or casing connected with or formed upon the end of said lower brake-rod and having therein rack-teeth and a gravity locking-pawl pivotally connected with the lower end of the brake-lever, which is projected into the box or casing and by the engagement of which pawl with the rack-teeth the brakes are applied. Combined with these parts is the take-up pawl, which is pivotally connected, also, upon the brake-lever above

the first-mentioned pawl and engages separate rack-teeth formed within or upon the casing.

In operation the rocking of the brake-lever over its pivot applies the brake through the locking of the lower end of said lever with the lower brake-rod by means of the locking-pawl. In this movement the adjusting-pawl plays freely or loosely upon its teeth; but when the brake-shoes are so worn as to permit sufficient movement of the adjusting-pawl it will ride up and eventually drop over a new tooth. Upon the release of the brake-lever the adjusting-pawl will temporarily form the fulcrum for the lever, and in the backward movement of the lower end thereof the locking-pawl will slide back and engage a new tooth, thus virtually shortening the lower brake-rod and taking up the slack.

In the drawings, 10 represents the live-lever and 11 the dead-lever of the brake-gear.

12 represents the upper brake-rod, and 13 the lower brake-rod, which latter is pivotally connected at one end to the dead-lever, and at its opposite end it is preferably bolted to a box or casing 14. Said box is longitudinally slotted through its top wall for the admission of the lower end of the lever 10 and in the construction shown in Figs. 3, 4, and 5 has formed upon its bottom the rack-teeth 15, preferably arranged near the side walls of the box, as shown in Fig. 5. Pivotaly connected to the lower end of the brake-lever within this casing is the locking-pawl 16, which has teeth adapted to engage the rack-teeth 15, said pawl being bifurcated in the preferred construction. The casing has upon its side walls the lateral flanges 17, upon the upper surfaces of which are formed the rack-teeth 18, which are adapted to be engaged by the members of the bifurcated adjusting-pawl 19, pivotally connected to the lever 10 by the pin 20.

In the application of the brake with the construction described the pawl 16 locks the brake-rod 13 and the live-lever together, thus resulting in the simultaneous application of the brake-shoes to both pairs of wheels of the truck. When the shoes are properly adjusted to the wheels, the angular movement of the lever necessary to apply the brakes is not

so great as to permit the adjusting-pawl to ride over and engage a new tooth; but when the shoes have so worn that the slack is sufficient to permit the adjusting-pawl 19 to ride
 5 over and engage a new tooth in the application of the brake upon the release of the lever the fulcrum will be the pin 20 and the locking-pawl 16 will ride over and also engage a new tooth, thus effecting the taking up of the
 10 slack. The pitch of the teeth will be such as to permit the taking up of the slack at such intervals as will keep the piston travel practically uniform.

In the form of construction shown in Figs.
 15 6, 7, and 8 the rack-teeth 15 are formed upon the side walls instead of the bottom wall of the box or casing 14, and the pawl 16, instead of being bifurcated, as in the previously-described construction, consists of two separate
 20 members, and these members are held in engagement with the rack-teeth by the outwardly-forcing springs 21. One advantage of this last-described construction is that it enables the use of longer rack-teeth and the
 25 placing of said rack-teeth in such position that the strain shall be in line with the brake-rod; but it is not so reliable in constructions of this kind as the gravity-pawl shown in the previously-described construction.

30 In applying this adjuster to an inside brake, as shown in Fig. 2, the same devices are employed, except that the connection of the lower brake rod is at the opposite end of the casing from that shown in the several figures,
 35 as indicated in dotted lines in Fig. 6, and the take-up operates to lengthen instead of to shorten the lower brake-rod.

My invention provides an efficient slack-adjuster having few parts and those of simple construction. The device is compact and
 40 the operative parts are inclosed, except for the narrow slot at the top of the casing, and are thus protected against accidental displacement and such interference with their working as would result from an accumulation
 45 of dust or ice in the rack-teeth.

It is evident that the invention may be readily applied to car-brakes already in use
 50 by disconnecting the lower brake-rod from the brake-levers and connecting one end thereof to the casing and by drilling a hole in the lever for the adjusting-pawl.

It is obvious that my invention may be applied to other parts of the brake-gear than the connection between the lower end of the
 55 live-lever and the lower brake-rod—as, for example, it might be applied to the upper end of the live-lever and used to shorten the upper brake-rod, so as to adjust the slack—and it may also be applied to any other lever of the
 60 brake-gear which has sufficient movement to insure the taking up of the slack—as, for example, it might be adapted to the cylinder-levers or to the floating levers of the brake-gear.
 65

I claim—

1. In a slack-adjuster for car-brakes, the combination, with a brake-rod and a lever forming part of the brake-gear, of a casing secured to the brake-rod and having rack-
 70 teeth thereon, a locking-pawl carried by the lever and adapted to engage the rack-teeth, and an adjusting-pawl also connected with the lever and adapted to engage rack-teeth within or upon the casing, substantially as
 75 described.

2. In a slack-adjuster for car-brakes, the combination, with the live-lever and brake-rod, of a casing connected to the brake-rod and apertured for the reception of the lower
 80 end of the brake-lever, said casing having rack-teeth, a locking-pawl carried by the lower end of the brake-lever and adapted to engage the teeth of the casing, and an adjusting-pawl pivotally connected to the brake-
 85 lever and adapted to engage rack-teeth upon the casing, substantially as described.

3. In a slack-adjuster for car-brakes, the combination, with the live-lever and brake-rod, of a casing connected to the brake-rod
 90 and apertured for the reception of the lower end of the brake-lever, said casing having rack-teeth upon its vertical walls at each side of the aperture, pawls or detents carried by said lever and normally thrust therefrom
 95 by the action of suitable outwardly-forcing springs, and an adjusting-pawl pivoted to the brake-lever and adapted to engage rack-teeth upon the casing, substantially as described.

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