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J. M. HAMMOND.  
AUTOMATIC SLACK ADJUSTER.  
APPLICATION FILED APR. 15, 1904.

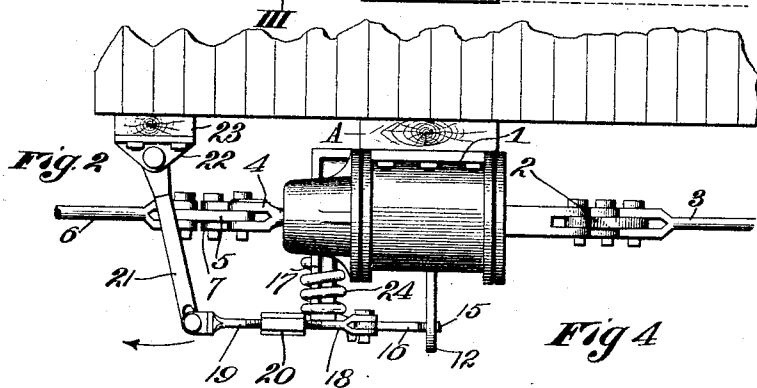
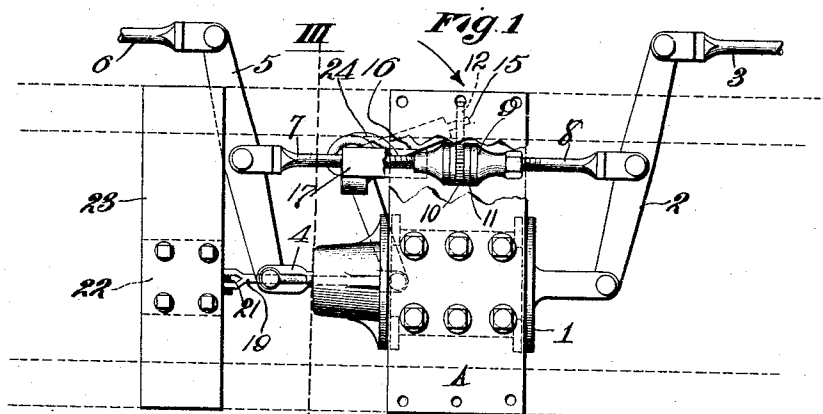


Fig. 3

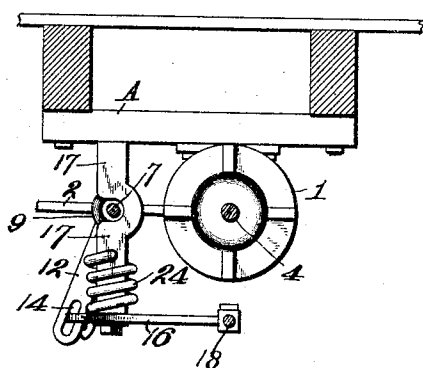
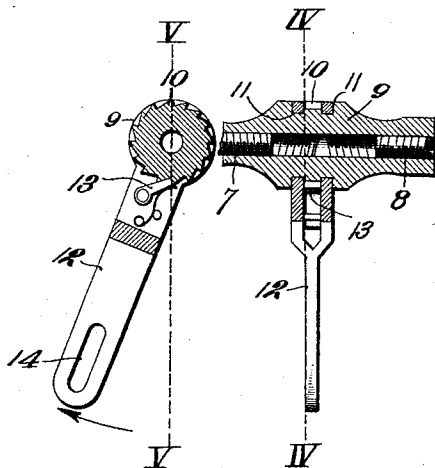


Fig. 4

Fig. 5



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC SLACK-ADJUSTER.

SPECIFICATION forming part of Letters Patent No. 782,848, dated February 21, 1905.

Application filed April 15, 1904. Serial No. 203,269.

*To all whom it may concern:*

Be it known that I, JAMES M. HAMMOND, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Automatic Slack-Adjusters, of which the following is a specification.

This invention relates to automatic slack-adjusters for air-brake systems, and has for its object to produce a mechanism of this character which operates efficiently and reliably and is of simple, strong, and durable construction.

With this object in view the invention consists in certain novel and peculiar features of construction and combinations of parts, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a top plan view of a part of an air-brake system equipped with my improvement, certain stringers at the bottom of the car being shown in dotted lines. Fig. 2 is a side view, said figure also showing a portion of the car. Fig. 3 is a cross-section on the line III III of Fig. 1. Fig. 4 is an enlarged section taken on the line IV IV of Fig. 5. Fig. 5 is a section taken on the line V V of Fig. 4. In the said drawings, A designates the cross-timber, from which the brake-cylinder 1 is suspended in the usual manner.

2 is a lever pivoted to one end of the cylinder and connected at its opposite end to rod 3. 4 is the piston-stem of the cylinder; 5, the lever pivoted thereto and connected pivotally to rods 6. Ordinarily levers 2 and 5 are connected together by a non-extensible link. In this case the connecting-link is extensible and consists of the right and left hand threaded rods 7 and 8, connected by a correspondingly-threaded turnbuckle or nut 9, which may be turned by a wrench when desired. This turnbuckle is provided centrally with a circular series of ratchet-teeth 10, flanked by circular grooves 11, wherein is pivotally mounted the end of a bifurcated lever 12, said lever having a spring-actuated pawl 13, engaging said ratchet-wheel. The lower end of said lever, which is disposed to swing trans-

versely of the car, is provided with a longitudinal slot 14, and extending loosely through the same is the reduced portion 15 of a bell-crank lever 16, pivoted for operation in a horizontal plane to the lower end of a hanger 17, said hanger being preferably secured rigidly in any suitable manner to the timber A. The opposite end of the bell-crank is pivotally connected to the extensible link consisting of the oppositely-threaded rods 18 and 19, connected by a turnbuckle 20, rod 19 in turn being pivotally connected to a swinging link 21, pivoted at its upper end to the bracket 22, secured to the under side of a second cross-timber 23, said swinging link 21 being disposed in longitudinal alinement with the piston-stem and at a distance from the latter slightly in excess of its regular travel, a spring 24, secured by preference to hanger 17 and pressing against the bell-crank lever, serving to hold the latter and therefore the swinging link in the position desired.

In practice the ordinary application of the brake occurs without affecting the position of link 21, and consequently its connections. In case, however, there is an excessive slack in the brake mechanism and in consequence an excessive travel of the piston the stem of the latter strikes the swinging link and moves it in the direction indicated by the arrow, Fig. 2, this movement obviously overcoming the resistance of spring 24 and swinging the bell-crank in the direction indicated by the arrow, Fig. 1. As this movement occurs the lever 12 is thrown in the direction indicated by the arrow, Fig. 4, from the position shown in dotted lines to the position shown in full lines, Fig. 4, the pawl slipping inoperatively over the teeth of the ratchet in such movement. As the brakes are released and the brake-cylinder piston returns to its original position the coil-spring 24 reverses the operation of the bell-crank lever, and consequently of lever 12, which reverse action of said lever through the medium of the pawl-and-ratchet mechanism rotates the turnbuckle and moves the rods 7 and 8 toward each other, so as to shorten the extensible rod, and thus take up slack in the brake mechanism, the connection between the bell-crank lever and lever 21, at

the same time returning the latter to its original position, where it is again ready to be operated by an excess travel of the brake-cylinder piston. This automatic shortening of the  
 5 extensible rod takes up slack in the brake mechanism, and consequently insures a shorter stroke of the piston on its next action. If it travels too far on the next stroke, it immediately operates lever 21, and spring 24 in  
 10 returning the latter after the release of the brakes effects the further shortening of the extensible connection between levers 2 and 5, which action is repeated until the travel of the piston is confined within proper limits.

15 The mechanism embodying my improvement may of course be otherwise arranged and proportioned, it being necessary, however, irrespective of the particular arrangement, that the excessive travel of the piston  
 20 shall be the means whereby my improved mechanism shall be operated to take up slack.

When my improvement is first applied or when worn brake-shoes (not shown) are re-  
 25 placed by new ones, the repairer will extend or contract the extensible connection between levers 2 and 5 by turning turnbuckle 9 with a wrench.

From the above description it will be apparent that I have produced an automatic  
 30 slack-adjuster which embodies the features of advantage enumerated as desirable and which obviously is susceptible of modification in various particulars without departing  
 35 from the essential spirit and scope.

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

1. The combination in an air-brake mech-

anism, of a brake-cylinder mechanism; a lever; 40  
 a lever connected to the piston-stem of the cylinder; an extensible connection between said levers; a lever in the path of the piston-stem; a stationary support; a bell-  
 45 crank lever pivoted thereon and linked to the last-named lever; a pawl-and-ratchet mechanism for varying the length of the extensible connection, having a pin-and-slot connection with the bell-crank lever; and a spring  
 50 secured to said support and pressing against the bell-crank lever in opposition to the movement imparted by the piston-stem to the lever in its path.

2. The combination in an air-brake mechanism, of a brake-cylinder mechanism; a lever; 55  
 a lever connected to the piston-stem of the cylinder; an extensible rod consisting of two alined members oppositely threaded at their proximate ends, and a turnbuckle connecting such ends and provided with peripheral ratchet-teeth; a lever pivoted on the turn-  
 60 buckle and provided with a pawl held yieldingly in engagement with the ratchet-toothed portion of the turnbuckle; a bell-crank lever having a pin-and-slot connection with the  
 65 pawl-carrying lever; a lever in the path of advance movement of the piston-stem and pivotally linked to the bell-crank lever, and a spring to return the pawl-carrying lever to its original position after the brakes have been  
 70 released by the return movement of the piston-stem.

In testimony whereof I affix my signature in the presence of two witnesses.

JAMES M. HAMMOND.

Witnesses:

H. C. RODGERS,  
 G. Y. THORPE.