H. F. WOOD & J. GULLAGE.

AUTOMATIC SLACK ADJUSTER FOR BRAKES.

APPLICATION FILED JULY 29, 1914.

1,144,453.

Patented June 29, 1915.

2 SHEETS—SHEET 1.

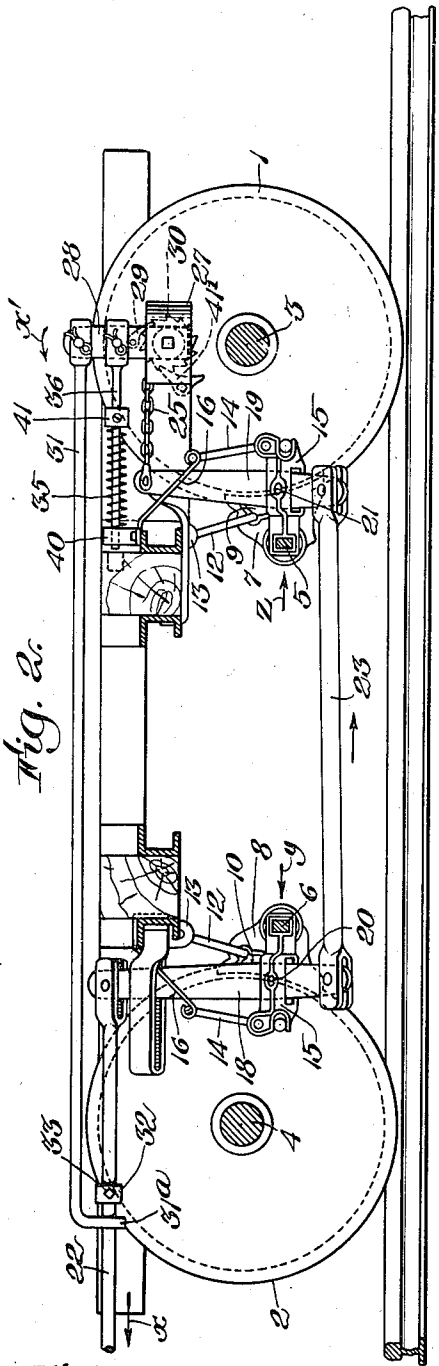


Fig. 2.

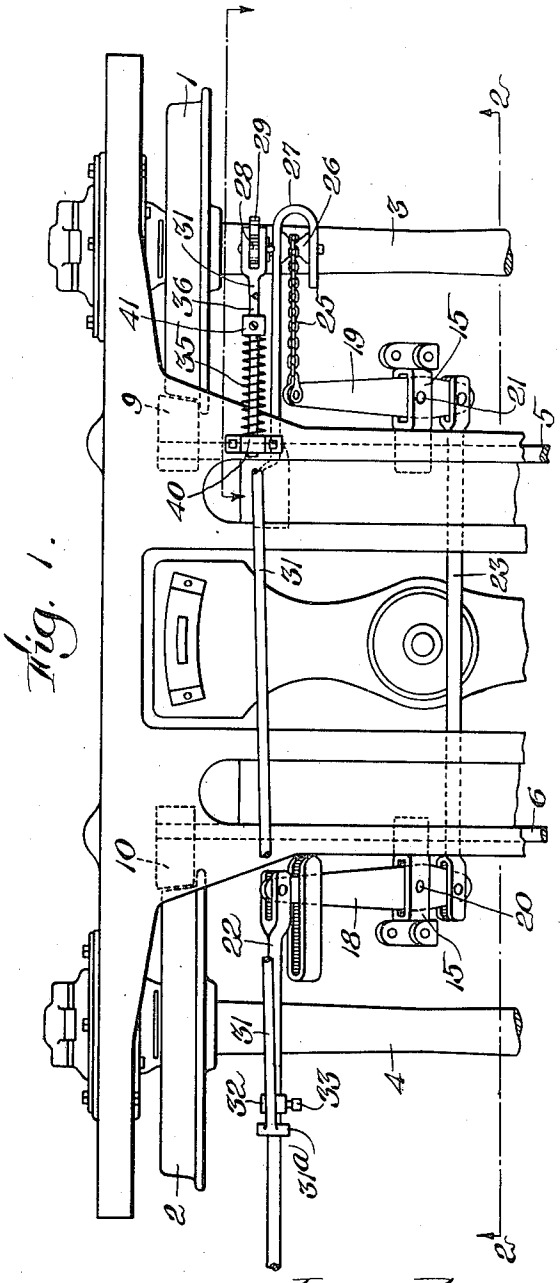


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 3.

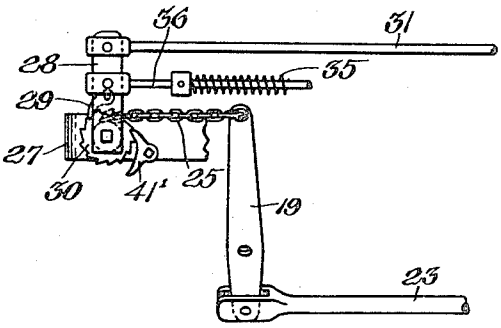


Fig. 4.

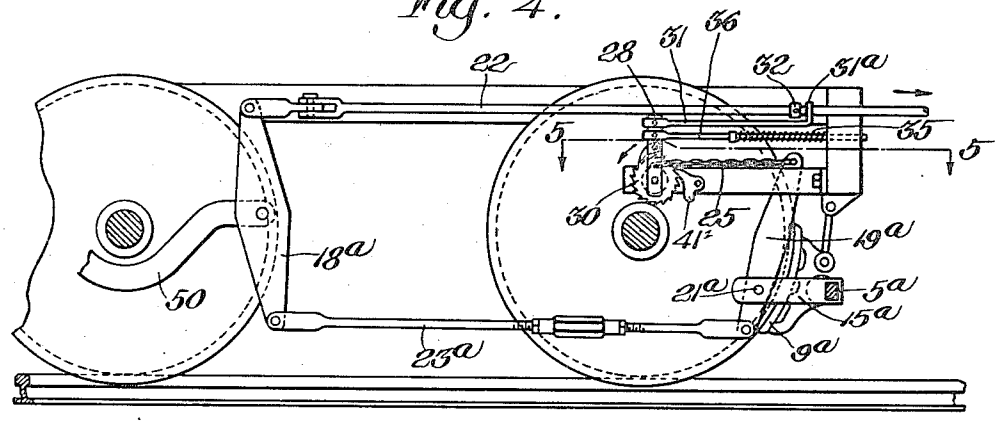
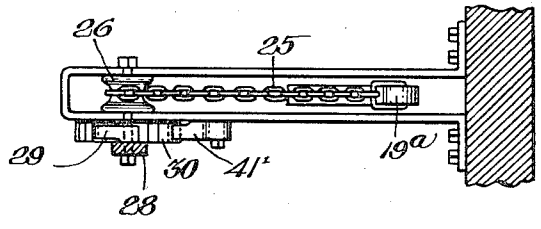


Fig. 5.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SLACK-ADJUSTER FOR BRAKES.

1,144,453. Specification of Letters Patent. Patented June 29, 1915.

Application filed July 29, 1914. Serial No. 853,966.

To all whom it may concern:

Be it known that we, HERBERT F. WOOD and JOSEPH GULLAGE, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Automatic Slack-Adjusters for Brakes, of which the following is a specification.

The object of the present invention is to provide simple and effective means by which the wear of brakes or brake shoes and other parts of a braking mechanism may be taken up as soon as the space between the brake and the wheel on which it acts becomes, when the brake is relaxed, more than a certain amount.

The invention has particular reference to the braking appliances of railway rolling stock, wherein the brakes are provided with metal shoes which are subject to great and rapid wear, and are retained in use until worn out before being discarded. Such shoes when new are given considerable thickness in order that their life may not be so short as to require constant renewal, and as a consequence, the amount of stock which may be removed before they are worn out is so great that relatively large spaces are finally left between the wheels and shoes in the relaxed position of the brakes, requiring correspondingly great motion of the brake-operating mechanism every time the brakes are applied to the wheels. It is desirable that this wear should be taken up in order to avoid the excessive motion of the operating mechanism caused thereby, and with this end in view we have devised an improved form of mechanism for shifting the fulcrum of one of the brake levers automatically as soon as excessive wear occurs and by amounts sufficient to take up such wear.

Referring to the drawings, Figure 1 represents a partial plan view of a railway truck with a slack adjuster embodying the invention applied thereto; Fig. 2 is a longitudinal sectional view on line 2—2 of Fig. 1; Fig. 3 is an elevation of a portion of the mechanism shown by Fig. 2, looking from the opposite side; Fig. 4 is a view similar to Fig. 1, showing a different embodiment of the invention; Fig. 5 is a detail sectional view on line 5—5 of Fig. 4.

The same reference characters indicate the same parts in all the figures.

Referring first to the embodiment of the invention shown by Figs. 1, 2 and 3 of the drawings, the characters 1 and 2 represent the wheels on one side of the truck, such wheels being mounted upon axles 3 and 4 respectively. The truck represented is one of the common or standard four-wheel trucks in which there are two sets of brakes, one set for each pair of wheels arranged at respectively opposite sides of the wheels. At the ends of the truck are brake beams 5 and 6 carrying on their ends the brake heads 7 and 8, which are provided with detachable brake shoes 9 and 10 arranged to bear directly against the rims of the several wheels. The brake beams are hung in the manner usual in this type of truck and are held yieldingly away from the wheels preferably by gravity.

As here shown, the brake heads are loosely supported by oscillatory links 12 pivoted at their lower ends to said heads and at their upper ends to fixed supports such as ears 13 on the truck frame.

The brake beams are loosely supported by links 14 pivoted at their lower ends to arms 15 attached to the brake beams, and at their upper ends to fixed supports such as brackets 16 on the truck frame. The arrangement is such that when the brake shoes are relaxed they tend to swing away from the peripheries of the wheels by gravity.

The brake beam arms 15 are preferably slotted to receive levers 18, 19, which are connected with said arms by fulcrum pins 20, 21, each lever having a shorter and a longer arm. A brake rod 22 is connected to the longer arm of the lever 18 and may be operated, as usual, either by compressed air of the air brake system, or by a hand-braking apparatus. The shorter arms of the levers 18 and 19 are connected by a rod 23, which transmits motion from one lever to the other.

The brake rod 22 is moved in the direction of the arrow x (Fig. 2) to set the brakes, and first acts through the lever 18 and its connections with the shoe 10 to move the said shoe in the direction of arrow y, thus applying said shoe to the wheel 2 and rendering the fulcrum 20 stationary, and then acts through the rod 23, lever 19, and the connections between said lever and the brake shoe 9, to move said shoe in the direction of arrow z and apply it to the wheel 1.

The longer arm of the lever 19 is connected with the truck frame by a tether 25,

which is preferably a short chain attached at one end to the lever 19 and at the other end to a wheel or pulley 26 journaled in fixed bearings on the truck frame, said bearings being preferably formed in a bracket 27 attached to the truck frame.

Mounted to oscillate on the shaft of the pulley 26 is an arm 28 carrying a pawl 29 engaging a ratchet 30 attached to said shaft. A rod 31 connected with the outer end of the arm 28 has a bent end 31^a having an orifice through which the brake rod 22 passes loosely. The brake rod has an adjustable collar or projection 32 secured to it by a set screw 33, and adapted to abut against the bent end 31^a and move the rod 31 in the direction of the arrow x, and the arm 28 in the direction of arrow x', when the brake rod is moved to set the brakes. The arrangement of the teeth of the ratchet 30 and of the pawl 29 is such that the described movement of the arm 28 moves the pawl backwardly on the ratchet.

When the brake shoes are new and unworn the collar 32 is adjusted so that it will not be brought into contact with the bent end 31^a by the brake-setting movement of the rod 22. The amplitude of the brake-setting movement of the rod 22 is gradually increased by wear of the brake shoes until it is sufficient to cause the collar 32 to impart the described movement to the arm 28 and pawl 29. When said movement becomes sufficient to move the pawl a distance slightly greater than the length of one tooth of the ratchet 30, the pawl takes a new hold of the ratchet so that when the brake rod 22 is released a spring 35 acts on a rod 36 connected with the arm 28, to move said arm in the direction opposite that indicated by arrow x'. The pawl is thus caused to rotate the ratchet 30 and pulley 26 step by step in the direction required to take up or shorten the tether 25 and move the levers 19 and 18 and the brake shoes, through the described connections, in the directions required to locate the shoes nearer the peripheries of the wheels, and thus compensate for the wear of the shoes.

The spring 35 abuts at one end on a fixed guide 40, in which the rod 36 is movable, and at the other end on a collar 41 attached to said rod. The brake-setting movement of the brake rod compresses the spring 35 and sets it for action, the spring acting automatically when the brake rod is released.

A stop pawl 41′ engaging the ratchet 30 limits the movement imparted to the take-up pulley 26 by the pawl 29.

Figs. 4 and 5 show a different embodiment of the invention adapted to a six-wheeled truck, although only two of the three wheels at one side of the truck are shown. The brake head and beam associated with the third wheel (not shown) may be connected by a rod 50 with a lever 18^a having arms of equal length. One of the arms of the lever 18^a is connected with the brake rod 22 having the collar 32. The other arm of said lever is connected by a rod 23^a with the shorter arm of a lever 19^a corresponding to the lever 19 and fulcrumed at 21^a on an arm 15^a which is attached to the brake beam 5^a. The longer arm of the lever 19^a is connected with the tether 25.

The brake-setting movement of the brake rod 22 first applies the brake shoe (not shown) connected with the rod 50, and then applies the brake shoe 9^a connected with the lever 19^a. The wear of the shoe 9^a is compensated for by the means already described in connection with Figs. 1, 2 and 3.

In each embodiment of our invention the lever 19 or 19^a constitutes a brake lever having a fulcrum which is shiftable by the shortening of the tether to compensate for wear of the brake shoes.

Having described our invention, we claim:

1. In a slack adjuster for brakes, a take-up wheel and a ratchet wheel and a pawl-carrying actuating lever therefor all in axial alinement, said take-up wheel and said ratchet wheel being fixed with relation to each other, a rod one end of which is pivoted to said lever and the other end of which is arranged to slide on the brake rod, said slidable rod being actuatable by setting movement of the brake rod to carry said lever to potential take-up position, and a spring-pressed rod substantially parallel with said slidable rod and pivoted to said lever and arranged to move said lever to cause take-up movement of said ratchet and take-up wheel upon release of the brakes.

2. In a slack adjuster for brakes, a take-up wheel and a ratchet wheel and a pawl-carrying actuating lever therefor all in axial alinement, said take-up wheel and said ratchet wheel being fixed with relation to each other, a rod one end of which is pivoted to said lever and the other end of which is arranged to slide on the brake rod, said slidable rod being actuatable by setting movement of the brake rod to carry said lever to potential take-up position, a second rod pivoted to said lever and disposed substantially parallel with said slidable rod and operable by a compression spring to move said lever to cause take-up movement of said ratchet and take-up wheel upon release of the brakes, and means for adjusting the pressure of said compression spring.

3. In a slack adjuster for brakes, the combination with the brake rod and an adjustable member thereon, of a take-up wheel and a ratchet wheel and a pawl-carrying actuating lever therefor all in axial alinement, said take-up wheel and said ratchet wheel being fixed with relation to each

other, a rod one end of which is pivoted to said lever and the other end of which is arranged to slide on the brake rod, said slidable rod being actuatable by said adjustable member upon setting movement of the brake rod to carry said lever to potential take-up position, and a spring-pressed rod pivoted to said lever and disposed substantially parallel with said slidable rod and operable by a compression spring to move said lever to cause take-up movement of said ratchet and take-up wheel upon release of the brakes.

In testimony whereof we have affixed our signatures, in presence of two witnesses.

HERBERT F. WOOD.
JOSEPH GULLAGE.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."