





# UNITED STATES PATENT OFFICE.

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## AIR-BRAKE CONTROLLER.

No. 795,401.

Specification of Letters Patent.

Patented July 25, 1905.

Application filed March 24, 1904. Serial No. 199,808.

*To all whom it may concern:*

Be it known that I, EDWARD B. LEIGH, a citizen of the United States, residing at Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Air-Brake Controllers, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of my improved air-brake controller. Fig. 2 is a side elevational view. Fig. 3 is a sectional view on the line 3 3 of Fig. 1, and Fig. 4 is a sectional view on the line 4 4 of Fig. 1.

This invention relates to a new and useful improvement in air-brake controllers, the objects being to simplify the construction of such devices and to insure the full benefit of the excessive stroke of the piston being utilized in taking up the wear of the brake-shoes. As is well known in devices of this character, the primary function of an air-brake controller is to compensate for the wear of the brake-shoes or other inequalities arising in the system after the parts thereof are initially adjusted. The piston in ordinary practice is designed to move a predetermined distance at each stroke in setting the brakes, and if by reason of the wear of the shoes the piston is forced to travel a greater distance such excess movement is objectionable, it being desirable to restrict the effective stroke of the piston within the original limits for reasons that are obvious.

Heretofore in devices of the type shown in the accompanying drawings it has been proposed to shorten the tie-rod between the piston and cylinder levers by resorting to a turn-buckle construction operated by a ratchet-and-pawl mechanism, the pawl being actuated by a bell-crank lever pivoted to the under-frame of the car and having a projection in the path of the piston-rod.

In my construction the bell-crank lever is arranged on the pivotal connection between the tie-rod and piston-lever, and consequently is in a position at all times to give the full benefit of its stroke to the pawl-carrier.

In the drawings, 1 indicates the cylinder; 2, the piston-rod thereof; 3, a casting secured to the end of the piston-rod and providing a striker-plate; 4, the piston-lever pivotally connected to the piston-rod, and 5 the cylin-

der-lever pivotally connected to a post extending rearwardly from the cylinder. To the levers 4 and 5 are pivoted the threaded clevises 6, which receive the ends of the threaded tie-rod 7, said clevises practically forming part of said tie-rod. On the tie-rod 7 is fixed a ratchet-wheel 8, (see Fig. 4,) while loosely mounted on the tie-rod in juxtaposition to said ratchet-wheel is a housing 9, forming a pawl-carrier, in which housing is arranged a spring-actuated pawl 10, coöperating with the ratchet-wheel. This housing has a finger-like extension 11, which is received in the slotted end of a bell-crank lever 12. This bell-crank lever is provided with suitable depending stops 13 (see Fig. 3) for limiting its throw. The bell-crank lever 12 is fulcrumed on the pivotal connection between the clevis 6 and the piston-lever; but it is obvious that this pivotal connection could be on the clevis. The inner end 14 of the bell-crank lever is preferably bifurcated and provided with rounded contact edges, the bifurcated end receiving the cross-piece of the casting 3, while the rounded edges coöperate with the end walls of said casting.

In operation, assuming that the brake-shoes and the parts of the system are properly adjusted, the stroke of the piston necessary to set the brakes is ordinarily for freight-cylinders about eight inches. During this movement of the piston the bell-crank lever is not operated actively, and consequently the controller is ineffective. However, when the shoes become worn or for other reasons the piston exceeds its normal travel the inner end wall 3<sup>a</sup> of the casting 3 will contact with the member 14 of the bell-crank lever and cause said bell-crank lever to move on its axis of rotation from right to left in the positions of the parts shown in Fig. 4. This movement, if sufficient, will enable the pawl 10 to take a new bite on the ratchet in readiness to turn the tie-rod 7 and shorten the same when the brakes are released and the piston returns to normal position. The returning movement of the piston will cause the end wall 3<sup>b</sup> to contact with the end 14 of the bell-crank lever and positively move said bell-crank lever in such direction that the finger-like projection 11 will be restored, moving from left to right, the pawl forcing the ratchet to partially rotate. A succession of these movements will result in effectively shortening the tie-rod, and consequently the wear of the brake-shoes



or other inequalities in the system will be taken up automatically as the brakes are successively applied and released.

I am aware of United States Patent, granted to Jacobson August 11, 1903, No. 735,981, in which there is shown a bell-crank lever pivoted on the framing of the car, which bell-crank lever is designed to be struck by the piston-rod for the purpose of rocking the pawl-carrier to accomplish the shortening of the tie-rod. I do not, therefore, broadly claim this feature as new; but

What I do claim is—

1. In an air-brake controller, the combination with cylinder and piston levers, a tie-rod whose length is capable of being adjusted, and a bell-crank lever pivoted substantially in coincident with the pivotal point of the piston-lever and having movement independent thereof for cooperating with the tie-rod to shorten the same; substantially as described.

2. In an air-brake controller, the combination with cylinder and piston levers, of a striker-plate carried by the piston-rod, a bell-crank lever pivotally mounted on said piston-lever and having movement relative thereto, a tie-rod in which is included a turnbuckle, a ratchet, and a pawl whose carrier is in engagement with said bell-crank lever; substantially as described.

3. In an air-brake controller, the combination with piston and cylinder levers, of threaded clevises carried thereon, a tie-rod threaded in said clevises, a ratchet on said tie-rod, a pawl engaging said ratchet, a pawl-carrier, a bell-crank lever pivotally carried by an element of the air-brake system remote from the brake-cylinder and having a depending end, and means movable with the piston to positively move the bell-crank lever in different directions; substantially as described.

4. In an air-brake controller, the combination with a piston-lever and piston, of a striker-plate, a bell-crank lever pivotally mounted on the bolt which connects the piston-lever and tie-rod and movable independently of said piston-lever, a tie-rod including a rotatable element in its construction, whereby said tie-rod is extensible, and means actuated by the bell-

crank lever for adjusting the length of the tie-rod; substantially as described.

5. The herein-described striker-plate comprising a connecting member and end walls, in combination with a lever for actuating an air-brake controller, said lever having a bifurcated end embracing said connecting-plate and rounded edges for cooperating with said end walls; substantially as described.

6. The herein-described actuating-lever for air-brake controllers, the same having depending projections for limiting the movement of said lever; substantially as described.

7. The herein-described lever for actuating air-brake controllers, the same having means for limiting its movement, and a slotted end for receiving a rocking member of the controlling mechanism; substantially as described.

8. The herein-described extensible tie-rod for use in connection with air-brake controllers, the same having threaded ends engaging socketed connecting members, in combination with a ratchet-wheel fixed to said tie-rod, a housing inclosing said ratchet-wheel and supporting a pawl in engagement with said ratchet-wheel, a spring for holding said pawl in engagement with the ratchet-wheel, and a finger-like extension extending from the housing; substantially as described.

9. In an air-brake controller, the combination with cylinder and piston levers, a tie-rod whose length is capable of being adjusted, and a bell-crank lever carried by the piston-lever and independently movable with respect thereto, for cooperating with the tie-rod to shorten the same; substantially as described.

10. In an air-brake controller, the combination with cylinder and piston levers, of a striker-plate carried by the piston-rod, and a bell-crank lever pivotally mounted on said piston-rod; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 10th day of March, 1904.

EDWARD B. LEIGH.

Witnesses:

E. T. WALKER,

C. F. HUNTOON.