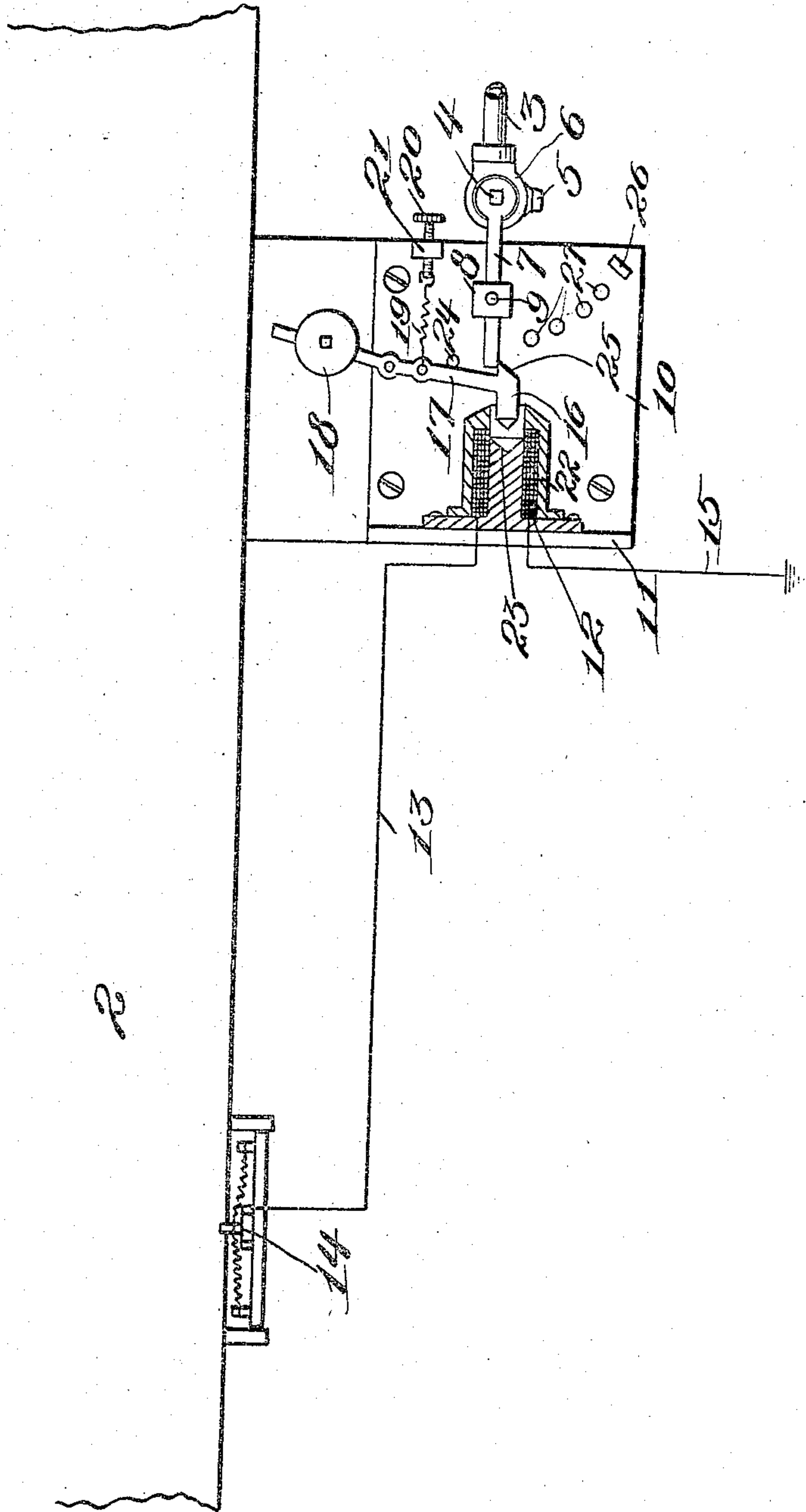


No. 891,780.

PATENTED JUNE 23, 1908.

H. B. MILLER.  
AIR BRAKE APPARATUS.  
APPLICATION FILED DEC. 16, 1907.



Witnesses:

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# UNITED STATES PATENT OFFICE.

HARVEY B. MILLER, OF STAUNTON, VIRGINIA, ASSIGNOR OF ONE-HALF TO JAMES A. BELL,  
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## AIR-BRAKE APPARATUS.

No. 891,780.

Specification of Letters Patent.

Patented June 23, 1908.

Original application filed October 10, 1907, Serial No. 396,807. Divided and this application filed December 16, 1907,  
Serial No. 406,748.

*To all whom it may concern:*

Be it known that I, HARVEY B. MILLER, a citizen of the United States, residing at Staunton, in the county of Augusta and State of Virginia, have invented new and useful Improvements in Air-Brake Apparatus, of which the following is a specification.

This invention relates to air brake apparatus.

Air brake apparatus involving my invention can be used on vehicles propelled by steam, electricity, or any other motive agent and may be used as a part of or in connection with a system such as that shown in my application for patent Serial No. 396,807, filed October 10, 1907, of which the present application is a division.

In connection with the train pipe I provide a valve which is adapted to be automatically opened to reduce the pressure in the train pipe to either stop or cause the slowing down of a train, or it may be a single vehicle. In the present case this valve is electrically controlled and, when it forms a part of or is an adjunct to the system mentioned, its automatic opening is caused when the train is in dangerous proximity to a second train. It is not necessary, however, that the valve-operating means form a part of the system to which I have referred, for said valve-operating means can be used with advantage in other connections. I provide valve mechanism of a simple and advantageous character, and, by "valve mechanism," I refer to the valve and the various parts which coact therewith to cause the opening of the valve for the purpose of reducing air pressure within the train pipe.

In the drawing accompanying and forming a part of this specification I represent fully one form of embodiment of the invention which, to enable those skilled in the art to practice the same, will be set forth in detail in the following description, while the novelty of the invention will be included in the claims succeeding said description.

In said drawing the apparatus is represented in sectional elevation and as mounted upon a vehicle as 2. This vehicle may be the locomotive of a train or it may be an electric car. The vehicle is equipped with a train pipe 3 common in air brake apparatus, and said train pipe is provided with a suit-

able valve as 4 by opening which the pressure of air in the train pipe 3 can be reduced or exhausted to atmosphere by way of the nipple 5 depending from the valve casing 6. By a partial opening of the valve 4 the vehicle 2 may be caused to slow down. By a further opening of the valve the vehicle may be caused to stop.

I have shown as fastened to the stem of the valve 4 an arm 7 provided with an adjustable weight 8 adapted to be maintained in its different adjusted positions along the arm 7 by a screw as 9 tapped through the weight and adapted to engage the arm 7. The weighted arm constitutes a suitable and convenient valve-opening device and, in the present instance, when it is horizontal, the valve 4 will be closed so as to prevent the escape of air from the pipe 3 to the atmosphere by way of the nipple 5.

I have shown as fastened to the vehicle 2 a board or plate 10 represented as furnished at one end with a flange as 11 to which the electro-magnet 12 is suitably fastened. To one pole of the magnet 12 the wire 13 is connected and leads from the contact device 14 to which it is electrically connected. From the other pole of the magnet a wire as 15 leads to ground. When therefore the contact device 14 engages against an energized part such as one of the contact rails in the said application 396,807, the magnet 12 will be energized for the purpose of attracting its armature 16. The part 16, in addition to serving as an armature, also constitutes a detent or latch for normally holding the weighted arm 7 against shifting movement, and it is represented as carried at the lower end of the lever 17 shown as fulcrumed between its ends to the board or plate 10. The lever 17 is provided on its upper and short branch with an adjustable weight as 18 which is of a mass to cause the balancing of the two arms or branches of the lever; that is to say, the lever is a balanced one and it has in itself no tendency to swing about its axis. Should, however, it be from any accidental cause slightly off balance, the difficulty can be easily remedied by the adjustment of the weight 18. The armature 16 constitutes a transverse foot for the lever and, if desired, the two parts may be integral. When the magnet 12 is deenergized the armature-detent 16 is under the free end



of the weighted arm 7 so as to prevent said weighted arm from descending in a direction to open the valve 4. This relation in the present case is maintained in a positive manner, for example, by the spring 19 connected with the lower arm of the lever 17 and also with one end of a screw as 20 tapped through a projection or lug as 21 on the board or plate 10. By the operation of the screw 20 the tension of the spring 19 can be regulated. This spring holds the armature-detent 16 in its operative position and moves it to such position when the magnet 12 is deenergized. It will be assumed that the magnet is energized. When this occurs the armature-detent 16 is attracted and moved from under the arm 7, whereby said arm can swing downward to open the valve 4.

The magnet is provided with a casing or housing as 22 the outer end of which has an opening in which the armature-detent 16 is located at all times, the opening constituting a guiding means for the armature-detent. The core of the magnet is provided with a tapered seat as 23 which receives the correspondingly shaped end of the armature-detent 16 when the said magnet is energized.

When used with a system such as that illustrated in application 396,807 the magnet 12 is energized as soon as the contact device 14 strikes a contact rail, the result being that the armature-detent 16 is attracted by the magnet and is moved from under the free end of the arm 7 for releasing said arm. As soon as the magnet is deenergized the spring 19, by acting against the lever 17, returns the armature-detent 16 to its original or operative position at which time the said lever bears against a stop as 24 which may consist of a pin on the board or plate 10. The outer end of the armature-detent 16 has a beveled face 25 engageable by the weighted arm 7 as the latter is returned to its normal position by hand or otherwise. When the said weighted arm 7 is nearly horizontal it engages and then rides along the beveled face 25 so as to swing the armature-detent 16 to the left, the motion continuing until the said arm 7 passes free of said beveled face 25, at which point the spring 19 swings the armature-detent under the arm.

I provide means, as will now appear, for adjusting the length of movement of the arm 7 and, although the means may be of any desirable character, it comprises a stop or pin as 26 adapted to be placed in any one of the series of perforations or holes 27 formed in the board or plate 10 in an arc concentric with the axis of motion of the arm 7. The pin 26 is removably fitted in the lowermost perforation or hole 27 and the motion of the arm 7, when the same is released, will be continued until the arm strikes the pin 26. To reduce the motion of the arm 7 to the lowest possible extent the pin 26 will be removed

from the lowermost perforation or seat and will be placed in the uppermost perforation or seat.

What I claim is:

1. The combination of a train pipe, a valve for controlling the discharge of air from said train pipe, a weighted arm connected with said valve, a magnet having an armature constituting a detent for engaging and normally holding said weighted arm against movement when the magnet is deenergized, and a swinging lever to which said armature or detent is connected for movement therewith.

2. The combination of a train pipe, a valve for controlling the discharge of air from said train pipe, automatically-operable means for opening said valve, a detent for normally holding said automatically-operable means against movement, electrically-operable means for actuating the detent to effect the release of said automatically-operable means to cause the opening of the valve, and means for varying the amount of opening movement of the valve.

3. The combination of a train pipe, a valve for controlling the discharge of air from said train pipe, automatically-operable means for opening the valve, a balanced lever, a detent movable with said lever and adapted to hold the automatically-operable means against motion, an electrically-operable device for actuating said detent in a direction to release said automatically operable means, and means for normally holding the detent in its effective position.

4. The combination of a train pipe, a valve for controlling the discharge of air from said train pipe, automatically-operable means for opening said valve, a balanced lever provided with a detent for holding the automatically-operable means against movement, a spring acting against the lever to maintain the detent normally in its operative position, and electrically-operable means for moving the detent away from the automatically-operable means.

5. The combination of a train pipe, a valve for controlling the discharge of air from the train pipe, an automatically-swinging arm for opening the valve, a part having a series of seats arranged on an arc concentric with the axis of motion of said arm, a pin to removably fit said seats to control the amount of motion of the arm, a detent for normally holding the arm against movement, and means for operating said detent.

6. The combination of a train pipe, a valve for controlling the discharge of air from the train pipe, automatically-operable means for causing the opening of the valve, a lever provided with a detent for normally holding the said automatically-operable means against action, a spring acting against the lever to hold the detent normally in op-



erative position, and an electrically-operable device for causing the detent to free said automatically-operable means.

7. The combination of a train pipe, a valve for controlling the discharge of air from said train pipe, automatically operable means for opening said valve, and a lever provided with a detent to directly engage said automatically operable means and to

hold the same against operation, said detent 10 constituting an armature for said magnet.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HARVEY B. MILLER.

Witnesses:

C. A. CROWELL,

JOHN E. STODDARD.