Jan. 6, 1942. E. S. McGEE 2,268,953

LOCOMOTIVE BRAKE CONTROL ATTACHMENT

Filed March 29, 1941 2 Sheets-Sheet 1

Fig. 1

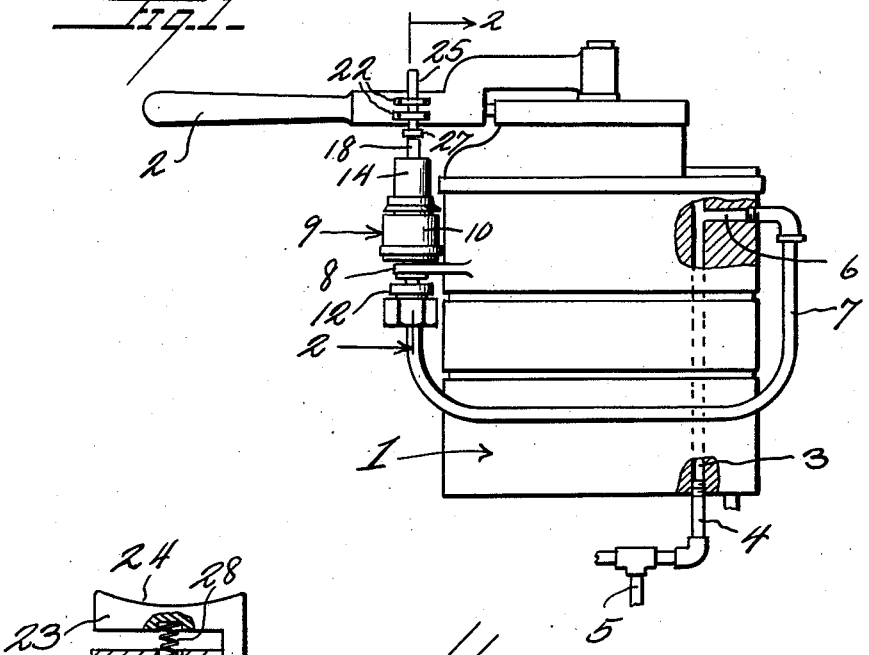
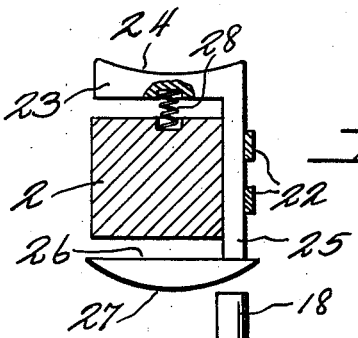


Fig. 2



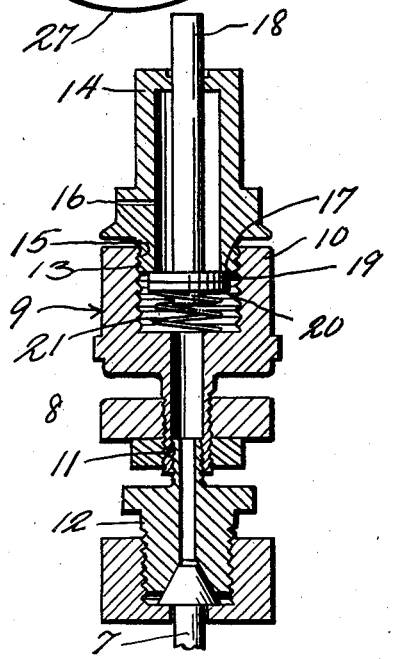
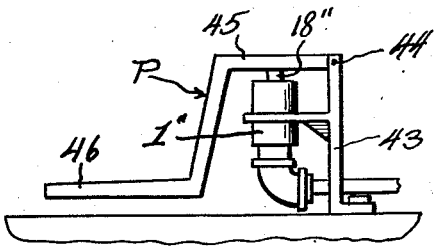


Fig. 6



Inventor

Edward S. McGee

By Watson E. Coleman

Attorney

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Fig. 4

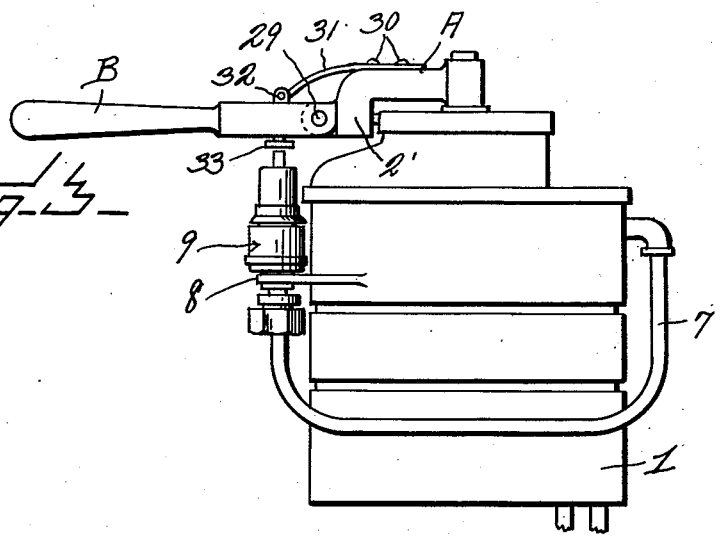


Fig. 5

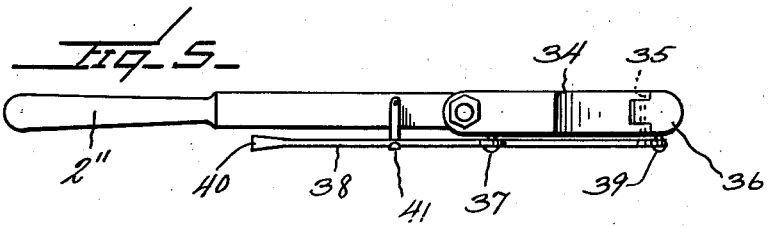
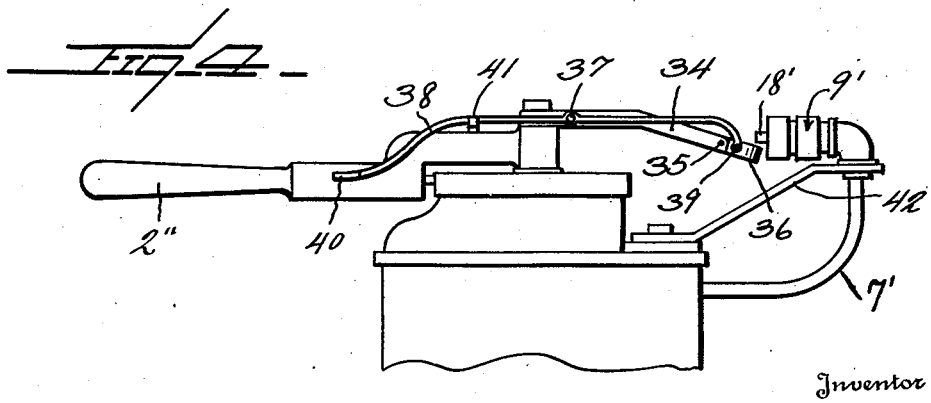


Fig. 6



Inventor

Edward S. McGee

By Watson E. Coleman

Attorney

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LOCOMOTIVE BRAKE CONTROL ATTACHMENT

Edward S. McGee, Atlanta, Ga.

Application March 29, 1941, Serial No. 385,946

10 Claims. (Cl. 303—40)

This invention relates generally to railway air brake equipment and pertains particularly to improvements in brake control valves.

At the present time railway brake control equipment includes a pair of valves for manipulation by an engineer, one of such valves being the automatic brake valve and the other the independent valve. The automatic brake valve is designed so that the brakes of the locomotive and those upon the train coaches may be applied or released by its operation alone and the independent valve is connected with the automatic valve in such manner that it may be manipulated so as to release the engine brake while the train or coach brakes are applied or are being held through the medium of the automatic valve. Also the engineer may apply the train coach brakes independently of the locomotive brakes by the procedure of holding the independent valve in release position while applying the automatic valve, this procedure requiring the use of both of the engineer's hands. Thus it will be seen that with the present equipment, if the engineer of a train desires to apply the train brakes only and hold the locomotive brakes off or if he desires to release the locomotive brakes independently of the train brakes, it is necessary for him to use both hands to do so. As a result, the engineer is not able while using both hands in this manner, to perform certain other functions which are sometimes required such as the giving of a hand signal.

The present invention has for its primary object to provide a novel means associated with the automatic brake valve which will enable the engineer to control the locomotive brakes simultaneously with the controlling of the train brakes by the use of one hand only or by the use of one hand and one foot, thus enabling the engineer to apply and/or release the locomotive brakes while controlling the train brakes, by the use of only one hand so as to have the other hand free for the performance of other duties.

A further object of the invention is to provide an auxiliary independent valve upon or adjacent to the automatic brake valve which is coupled with the application cylinder pipe leading to the automatic brake valve with means arranged to be operated by the thumb or a finger of the hand grasping the operating handle for the automatic brake valve or by the foot of the engineer for opening and closing such auxiliary valve whereby to release air from the application cylinder pipe and cause the application of the locomotive brakes or their release, as may be desired, while leaving the other hand of the engineer free for other duties.

Another object of the invention is to provide an attachment of this character for the automatic brake valve and which may be installed and operated without changing any of the structural features of the valve as at present in use so that the manner of operating the automatic brake valve remains the same, thus making it possible to install the present invention on any of the various makes or types of automatic brake valves which are at present in use.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings, it being understood, however, that the invention is not to be considered as limited by the specific illustration or description but that such illustration and description constitutes a preferred embodiment of the invention.

In the drawings:

Fig. 1 is a view in elevation of an automatic valve, parts being in section, showing the preferred form of the device embodying the present invention connected therewith.

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a view illustrating a modified construction of the auxiliary independent valve and control means therefor.

Fig. 4 is a view in side elevation of another form of control means for the auxiliary valve.

Fig. 5 is a view in top plan of the structure shown in Fig. 4.

Fig. 6 is a detail view showing the foot control means for the auxiliary valve.

As previously stated, the device embodying the present invention is designed so that it may be operated by the hand grasping the control handle of the automatic brake valve or it may be operated by the foot of the engineer. Reference will first be made to the invention as operated by hand in conjunction with the operation of the valve handle and Fig. 1 illustrates the invention as applied to a standard automatic valve such as the *H*–6 Westinghouse automatic brake valve. Wherever in the following specification and claims the term "automatic valve" is employed, it will be understood that the automatic brake valve which is manipulated by the engineer for control of the locomotive and engine brakes, is meant. This valve is indicated as a whole by the numeral 1, the same having the usual control handle 2 by means of which the rotary slide valve, not shown, is manipulated.

The numeral 3 designates a port in the valve 1, with which is connected the application cylinder pipe 4, which is connected with the independent valve, not shown, and by a branch line 5, with the distributing valve, not shown.

In carrying out the present invention, the body of the valve 1 is provided with a lateral port 6 communicating with the application cylinder pipe port 3 and there is coupled with this lateral port 6 one end of an air pipe 7, as shown.

The numeral 8 designates a bracket secured to the body of the valve 1 and this bracket supports an auxiliary independent valve which is indicated generally by the numeral 9. This auxiliary valve comprises a lower housing 10 having a nipple 11 which is extended through and secured to the bracket 8 to which is connected a coupling 12 by means of which the other end of the air pipe line 7 is joined to the nipple of the lower housing of the auxiliary valve so that air may be passed upwardly through this lower housing.

The upper part of the lower housing 10 is provided with the threaded bore 13 into which the passage from the nipple 11 opens, and this threaded passage facilitates the attachment to the lower housing of the upper housing 14 which is in the form of a vertically disposed cylindrical body, the lower end of which is threaded for engagement in the bore 13, as illustrated and as indicated at 15. The wall of this hollow body 14 forming the upper housing of the auxiliary valve is provided with a bleed passage or hole 16 which communicates with the interior of the housing. The lower end of the housing portion 15 which extends partway into the bore 13, forms a valve seat 7, as hereinafter described.

Extending longitudinally through the upper housing 14 is a valve stem 18 upon the lower end of which a rubber valve washer 19 is supported for engagement against the seat 17. This valve washer is supported by a collar or flange 20 and there is interposed between the collar and the bottom of the bore 13, the expansion spring 21 which, in the assembled auxilary valve, constantly urges the valve washer 19 against its seat.

The stem 18 of the auxiliary valve which extends through the top of the upper valve housing 14 is vertically arranged as shown, and the automatic valve handle moves over or across the upper end of this stem as the handle is moved for the purpose of moving the valve slide to lap or surface positions.

Upon one side of the handle there are located the vertically spaced guides 22 and these guides function to maintain in operative position on the handle, a thumb trigger 23 which comprises the top or thumb rest portion 24, the vertical slide portion 25 and the lower foot portion 26 which is relatively long and extends transversely of the under side of the handle and has a longitudinally arcuate or downwardly convexed sole 27. The arrangement of this trigger 23 on the handle is such that as the handle is moved, the foot will swing in an arcuate path to move over and in contact with the upper end of the stem 18 when the trigger is pressed down, but if the trigger is not depressed, then the foot will move over and free from contact with the upper end of the valve stem. A spring 28 is interposed between the thumb rest and the handle to constantly urge movement of the trigger upwardly so that it is necessary for the engineer, if he desires to open the auxiliary independent valve, to press the trigger down against the tension of the spring 28.

The auxiliary valve is so placed and the sole 27 of the trigger is so designed that the sole of the trigger is over the end of the valve stem 18 from lap to service positions and if pressed down will open the auxiliary valve allowing application air to escape to the atmosphere and preventing application air from building up in the application chamber and keeping the locomotive brakes from applying.

With the mechanism thus described, it will be readily seen that the engineer may operate the automatic valve in the usual manner to bring about application of the train and locomotive brakes. If, however, he desires to apply only the train brakes or if, after the train and locomotive brakes have been applied through actuation of the automatic valve, he desires to release the locomotive brakes, he depresses the thumb trigger 23 so as to force the foot 26 down on the auxiliary valve stem 18, thus opening the auxiliary valve and bleeding air from the application cylinder pipe 4 to effect release of the locomotive brakes. This action can be accomplished after the automatic valve handle has been set in service position, so as to release the brakes of the locomotive or if the thumb trigger is depressed before the automatic valve handle is moved to service position, then the locomotive brakes will not be applied but only the train brakes will be applied.

It is, of course, understood by those versed in the art that the regular independent valve can be used to apply the locomotive brakes only, if desired, as, for example, when the locomotive is being run alone or unattached to cars.

The arrangement which has been illustrated and described for controlling the auxiliary independent valve is preferred, however, other arrangements might be employed for controlling this independent valve in such manner as to permit the engineer to have one hand free for other uses. For example, in Fig. 3, there is illustrated an automatic valve handle 2' which is divided into the inner and outer portions A and B. These portions are pivoted together for oscillation on the horizontal pivot axis 29 so that the outer portion of the handle may be moved up and down while the handle is being turned for the oscillation of the disk slide valve.

Attached to the top of the inner portion A in any suitable manner as by stud bolts 30 is an outwardly extending flat spring 31, the outer end of which is attached to the outer portion B of the handle near the pivot 29, as indicated at 32. Beneath this attaching means 32 is supported the longitudinally arcuate presser foot 33 in position for engagement with the upper end of the auxiliary valve stem 18 when the outer portion B of the handle is depressed and the handle is turned to service position. It will be apparent from this that if the handle is turned without swinging the outer portion down, then the presser foot 32 will pass over the stem 18 of the auxiliary valve and both the locomotive and train brakes will be applied in the customary manner but if the handle is pressed down and the foot depresses the valve stem 18, then, of course, the locomotive brakes will not be applied but application will be made of the train brakes only. This foot 32, like the foot 26, is constructed to be over the valve stem from the lap to the service position of the automatic valve handle.

Figs. 4 and 5 show still another means for controlling the auxiliary independent valve by a finger of the hand grasping the automatic valve

handle. In this arrangement there is secured to the automatic valve handle 2'', from the pivoted end thereof, the radially extending arm 34 upon the outer end of which is pivotally supported upon a transverse axis 35, a nose 36 which is movable into or out of a position where it will engage and actuate the stem of the auxiliary independent valve when the handle is turned.

Extending lengthwise of the arm 34 and pivoted to one side thereof, as indicated at 37, is a control lever 38, the forward end of which is pivotally attached to a side of the nose, as indicated at 39, while the rear end terminates inwardly of the free end of the handle 2'' and at one side thereof and is flattened or otherwise formed, as indicated at 40, to be engaged by the thumb or a finger of the hand grasping the automatic valve handle.

A spring 41 is carried by the automatic valve handle and engages beneath the lever 38 rearwardly of the pivot 37 so as to normally oscillate the lever in a direction to depress the independent valve actuating nose 36.

The auxiliary independent valve is indicated generally in connection with this control arrangement by the numeral 9' and is supported horizontally on a bracket 42, as shown in such position that the stem 18' may be engaged and depressed by the nose 36 when the latter is raised through the medium of the lever 38. In this arrangement it will be seen that if the lever 38 is allowed to remain in normal position, the nose 36 will move past the auxiliary valve stem 18' without actuating the same so that the automatic valve when its handle is moved to service position, will set the brakes upon the locomotive and the train, but by raising the nose 36, the auxiliary valve stem will be actuated and, therefore, the locomotive brakes will not be set but only the brakes of the train.

Fig. 6 illustrates still another control method by which the auxiliary independent valve can be actuated by the foot of the engineer. In this arrangement it will be seen that there is provided a floor supported bracket 43 which is disposed vertically and which supports the auxiliary independent valve, here indicated by the numeral 1'', in vertical position. The air pipe 7' passes upwardly from the auxiliary independent valve to the automatic valve where it connects with the application port of this unit. The stem of the independent valve is directed vertically, as indicated at 18''.

Pivotally supported at 44 from the top of the bracket 43 is an arm 45 which extends across the top of and rests on the valve stem 18'' and is then connected with a dependent portion P which joins, at its lower end, a foot pedal 46. From this arrangement it will be readily apparent that the engineer by placing his foot on the pedal 46 and pressing it, will open the application cylinder pipe and thus prevent application of the locomotive brakes when he turns the automatic valve handle to service position. Removal of pressure from the foot pedal will permit the spring which controls the valve stem 18'' to raise the pedal and thus maintain the auxiliary valve closed.

From the foregoing, it will be readily seen that the device herein disclosed may be readily incorporated in the structure of any automatic brake valve at present in use without making any material changes in such valve construction except to form a small bore through a portion thereof for communication with the application port. It will also be seen that the present device in any one of its several forms does not change in any respect the mode of operation of the automatic brake valve so that after it has been applied, the engineer will not be required to learn any new method of manipulating the automatic valve or the independent valve. At the same time, by the use of any of the forms of the present invention, the engineer is not required to keep both hands in use for controlling the brake valves but can readily control both valves with one hand, thus leaving the other hand free for other duties.

In the illustration and description of the present invention, the control device, referred to as the auxiliary independent valve, has been shown connected with a port formed in the body of the automatic brake valve, which port communicates with the application cylinder pipe leading to this valve. However, it will be readily apparent to those versed in the art that such connection does not have to be made in this manner but may be made anywhere in the pipes 4 and 5, if desired, or in any other suitable manner which will establish the necessary connection with the application line, which would facilitate the reduction of pressure therein upon operation of the control.

It will also be recognized by those familiar with the art that the control will function as a graduated release for the locomotive brakes.

While it has been set forth in the forepart of the specification that the present invention has been shown as applied to a particular type of Westinghouse automatic brake valve, it is to be understood, and will be readily recognized by those versed in the art, that the invention may be readily coupled with other types of valves such, for example, as the New York air brake wherein substantially the same method is followed for controlling the locomotive brakes and the train brakes.

What is claimed is:

1. In an air brake system having an automatic brake valve and an application release line, a control valve, means connecting said control valve with the application release line, and means facilitating the actuation of said control valve for releasing air from the application release line coincident with the application of the automatic brake valve to service position.

2. In an air brake system having an automatic brake valve and an application release line, a control valve, means connecting the control valve with the application release line, and means facilitating the opening and closing of the control valve for the release of air from the application release line coincident with the application of the automatic brake valve to service position, said means being arranged to be actuated by a finger of the hand grasping the handle of the automatic brake valve.

3. In an air brake system including an automatic valve and an independent valve coupled in the customary manner with the automatic valve, a normally closed auxiliary valve, a coupling between said auxiliary valve and the application cylinder pipe line between the automatic and independent valves, and means for controlling said auxiliary valve for bleeding said application line.

4. The combination with an automatic brake valve of an air brake system, having a control handle and a port connected with the application cylinder pipe of the system, of a normally closed control valve in communication with said port, and means connected with the handle of

the automatic brake valve for facilitating the control of the auxiliary valve simultaneously with the movement of the automatic valve brake handle to service position.

5. The combination with an automatic brake valve of an air brake system, having a control handle and a port connected with the application cylinder pipe of the system, of a normally closed valve connected with said port, and means connected with the handle of the automatic valve for facilitating the control of the auxiliary valve simultaneously with the movement of the automatic valve handle to service position, said means comprising a movable member connected with said handle and adapted to be operated by a finger of the hand grasping the same and functioning when moved to one position to effect the opening of the auxiliary valve simultaneously with the movement of the handle to service position or while the handle is in service position.

6. The combination with an automatic brake valve of an air brake system, having a port connected with the application cylinder pipe of the system and a control handle, of a normally closed valve connected with said port, said second-mentioned valve having a reciprocable stem, a member movably supported upon the handle of the automatic valve and adapted to be shifted from a non-working position to a working position, and means carried by said member and arranged for engagement with said stem to effect the opening of the second-mentioned valve when the automatic valve handle is moved to service position.

7. The combination with an automatic brake valve of an air brake system having a port connected with the application cylinder pipe of the system and a control handle, of a normally closed auxiliary valve coupled with said port, said auxiliary valve having a reciprocable valve stem, said stem being vertically disposed in a plane beneath said handle, a vertically shiftable trigger member supported upon the handle, a foot forming a part of said trigger arranged to pass over the upper end of said stem upon turning the handle to service position, and resilient means normally maintaining the trigger and foot raised with respect to said stem, said foot, upon depression of the trigger and turning of the handle to service position engaging and shifting the stem to open the auxiliary valve.

8. The combination with an automatic brake valve of an air brake system having a port connected with the application cylinder pipe of the system and a handle, of a normally closed auxiliary valve supported adjacent the automatic valve and having a valve stem, an arm attached to said handle and movable therewith across the end of said stem, a nose pivotally attached to the arm and having a working position thereon in which it engages and actuates the stem to open the auxiliary valve when the handle is turned to service position, a lever pivotally supported upon the arm and having one end pivotally connected with said nose and having its other end disposed relative to the handle for engagement by a finger of the hand grasping the handle, and resilient means normally urging oscillation of the lever to a position to shift said nose to an inoperative position with respect to the auxiliary stem.

9. In an air brake system, having an automatic brake valve and an application release line, a normally closed control valve, means coupling the control valve with the application release line whereby the opening of the control valve will bleed said line, and a foot control operatively coupled with the control valve to facilitate the opening of the latter.

10. In an air brake system having an automatic brake valve and an application release line, a normally closed control valve, means coupling the control valve with the application release line whereby the opening of the control valve will bleed said line, said control valve having a reciprocable stem, a lever having a fulcrum support and operatively coupled with said stem, and a foot treadle connected with the lever for actuating the same to effect the movement of the stem to control valve open position.

EDWARD S. McGEE.