

F. A. PIERCE.
 AUTOMATIC BRAKE APPLYING MECHANISM.
 APPLICATION FILED OCT. 24, 1907.

931,798.

Patented Aug. 24, 1909.
 2 SHEETS—SHEET 1.

Fig. 1

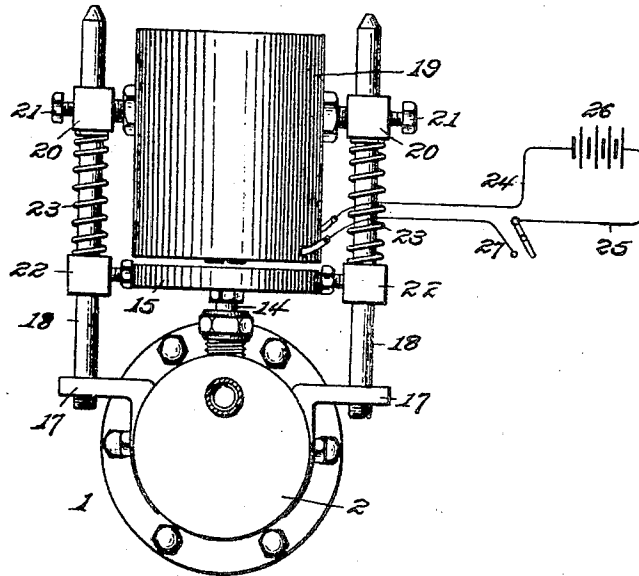
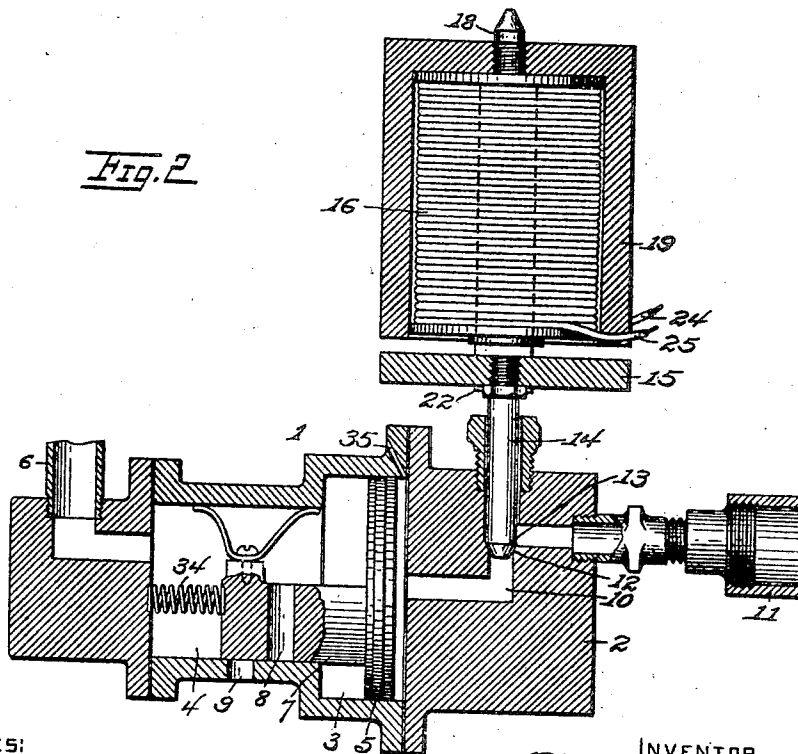


Fig. 2



WITNESSES:

F. Arthur
E. H. Larrick

INVENTOR

Franklin A. Pierce

BY

H. O. Dunlap
 ATTORNEY.

F. A. PIERCE.
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Fig. 3

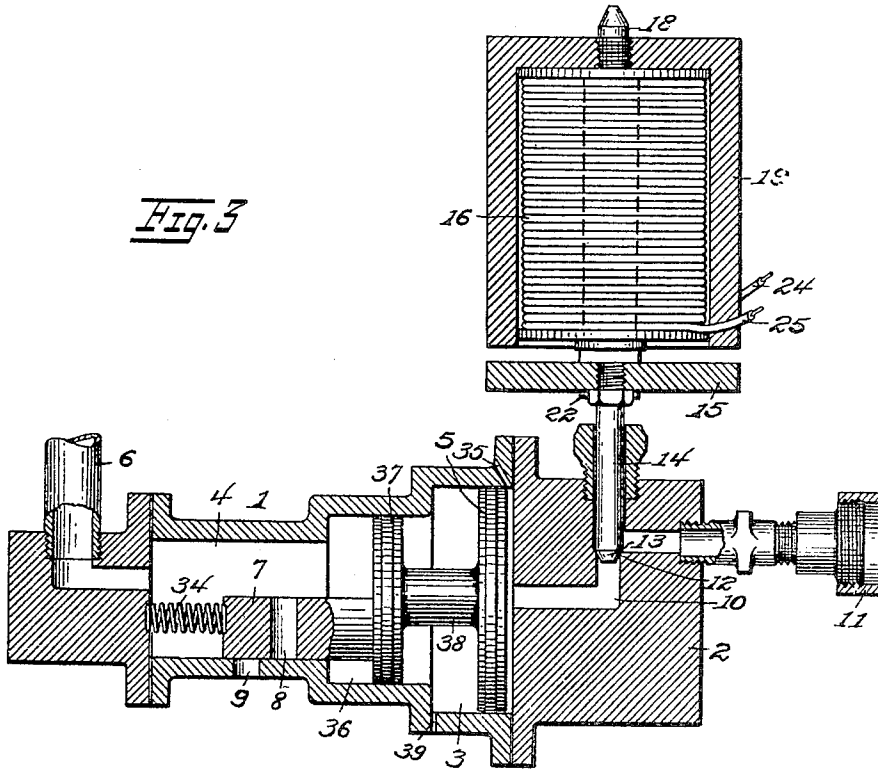


Fig. 4

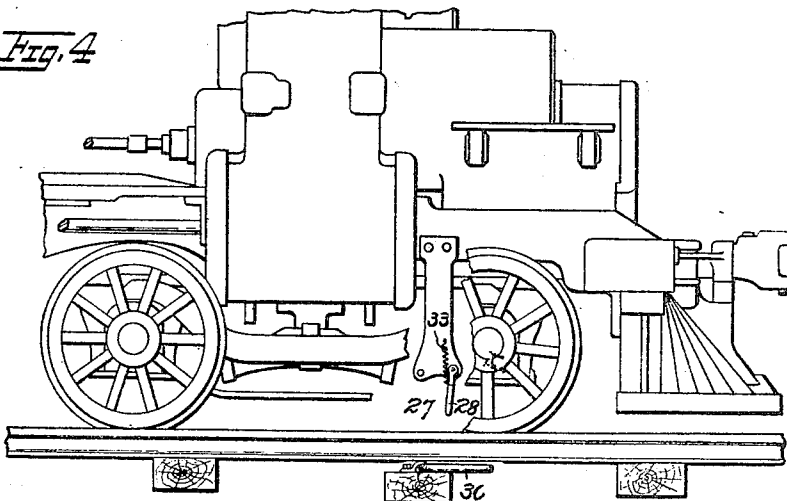
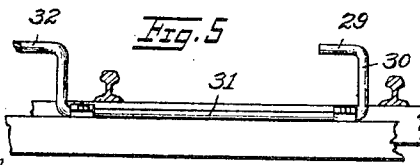


Fig. 5



WITNESSES:

J. C. Arthur,

E. J. Leonard.

INVENTOR

Franklin A. Pierce

By

H. E. Lunsell.

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANKLIN A. PIERCE, OF WHEELING, WEST VIRGINIA.

AUTOMATIC BRAKE-APPLYING MECHANISM.

931,798.

Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed October 24, 1907. Serial No. 398,886.

To all whom it may concern:

Be it known that I, FRANKLIN A. PIERCE, a citizen of the United States of America, and resident of Wheeling, county of Ohio, and State of West Virginia, have invented certain new and useful Improvements in Automatic Brake-Appling Mechanism, of which the following is a specification.

This invention relates to improvements in automatic brake-applying mechanism, and it has for its primary object to provide means whereby the air-brakes of a railway train are automatically applied when a warning semaphore or track-signal is unheededly approached or passed.

A further object is to provide, in connection with an ordinary air-brake system, a device which is adapted to be automatically actuated, by contact or engagement with a suitable mechanism connected with a semaphore or track-signal, to effect the setting of the brakes. And a still further object is to provide a device of the character mentioned wherein the necessity for electrical contact being made at the semaphore is dispensed with.

An example of mechanism of the general character named is found in my allowed application for Letters Patent, Serial No. 365,498, not yet issued; and the present invention is directed to the structural improvement thereof, the purpose being to simplify such mechanism.

The novelty of the invention resides in certain improvements, the exact nature of which will hereinafter appear, reference being had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a diagrammatic view of the invention, the release-valve being shown in rear-end elevation; Fig. 2 is a longitudinal section of said release-valve; Fig. 3 is a similar view illustrating a slight modification in the construction of the release-valve; Fig. 4 is a detail view of the switch, a portion of the locomotive being shown in side elevation; and—Fig. 5 is a detail view of the rocker.

Referring to said drawings, in which like designating characters distinguish like parts throughout the several views—1 indicates a release-valve which is adapted for mounting in any appropriate position on the engine, said valve consisting, in part, of a head 2, a piston-chamber 3 and a slide-valve chest 4, the latter being in open communication with the piston-chamber 3 in front of the piston 5

and having connection through a pipe 6 with the train line. Attached to the front face of the piston 5 is a slide-valve 7 having a port 8 therethrough which, at the end of the piston's forward stroke, registers with an exhaust port or vent 9 in the side of said slide-valve chest.

Leading through the head 2 is a port 10 which admits of the passage of air from the main reservoir of the engine to the piston-chamber behind the piston, said port having communication at its outer end with a pipe 11 leading to said main reservoir. Said port 10 has a valve-seat 12 therein at a point intermediate its ends upon which is normally seated a vertically-movable valve 13, the purpose of which will presently be made apparent. The stem 14 of said valve 13 projects outward from said head 2 and is rigidly attached to the armature 15 of an electromagnet 16 which is supported above said head in any appropriate manner, the form of mounting herein shown being but one of various mountings which might be employed. In the present instance, said mounting consists of oppositely-disposed supporting lugs 17 carried by said head, vertical posts 18 carried by said lugs, a casing 19 within which said magnet is rigidly held, said casing being open at its bottom, vertically-apertured ears 20 carried by said casing, said ears being mounted upon and vertically-movable along said posts and carrying set-screws 21 which are adapted to impinge upon said posts for holding said magnet in adjusted position. The armature 15 is also provided with vertically-apertured ears 22 which are slidably mounted upon said posts. Spiral springs 23 intervene between the ears 20 and the ears 22 for normally maintaining the armature depressed and the valve 13 seated upon said seat 12, thus effectually closing communication between the main reservoir and the piston-chamber.

The electromagnet 16 is included in a circuit comprising wires 24 and 25, and a battery 26 carried on the engine. A switch 27, or other appropriate device, is provided in said circuit, said switch being located at a suitable point on the engine for being tripped or thrown to close the electrical circuit by contact of its lever or handle 28 with a suitable tripping device controlled by the movement of the movable portion of a semaphore. Said tripping device may be of any appropriate form for effecting the throwing of the

switch, the device herein shown consisting of a horizontal arm 29 carried upon the vertical portion 30 of a rocker 31 whose crank-arm 32 is connected in any suitable manner with said semaphore to be operated thereby for raising and lowering said arm 29. When the switch lever or handle 28 strikes against the up-raised arm 29, as when a moving train passes a semaphore whose signal-arm is set, indicating that the train is to stop, said lever or handle is thereby forced rearwardly, closing the circuit through the electromagnet. The excited magnet immediately attracts the armature 15, raising the latter and, consequently, withdrawing the valve 13 from its seat 12, allowing the main reservoir pressure to pass unobstructedly to the piston-chamber 3 behind the piston 5. This results in said piston moving forward until the port 8 of the slide-valve 7 registers with the exhaust-port 9, whereupon the train line is vented, producing an emergency application of the brakes.

Attached to the switch-lever 28 is one end of a coil spring 33 whose opposite end is attached to a suitable stationary part of the engine. This spring is so arranged that, when said lever stands in a position leaving the circuit open, it has but little, if any, effect upon said lever; but, when said lever is swung back into circuit-closing position, it exerts a tension upon said lever which results in holding the latter in the last mentioned position. To recharge the train line and effect the return of all the parts to their normal positions, the said lever must be moved back by hand to its original position. When said lever is so returned, the piston and slide-valve are gradually moved back to their normal positions by the returning pressure in the train line, being initially so moved by a coil spring 34 which is seated between the end wall of the slide-valve chamber and the front end of the slide-valve, said spring being compressed by the forward movement of said slide-valve. The air in the piston-chamber behind the piston exhausts to the atmosphere through a suitably - located port 35.

In Fig. 3, is illustrated a slight modification of the construction of the release-valve, the purpose of which is to provide against

the possible equalization of the train line and main reservoir pressures and the consequent failure of the piston to operate, or move forward. With this end in view, a second piston-chamber 36 of a relatively-smaller diameter than the piston-chamber 3 is provided between the latter and the slide-valve chamber, and a piston 37 connected to the piston 5 by a stem 38 is operatively mounted in said chamber 36, the slide-valve being attached to the front face of the piston 37 instead of to the piston 5. Since the face of the piston 37 has a smaller surface than that of the piston 5, this construction admits of the operation of the device even when said pressures are equalized. A small port 39 is provided in the front end of the piston-chamber 3 which admits of the exhaustion of any air which may leak into said chamber past the pistons.

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

In combination with the train line and the main reservoir of an air-brake system, and with a trip device, means arranged between said train line and said main reservoir actuated by the pressure from the main reservoir to effect the exhaust of the train line pressure, said means including a piston, means for controlling the admission of said main reservoir pressure to said piston, the last-mentioned means including a vertically movable valve, a magnet, an armature to which the stem of said valve is attached, springs for normally maintaining said armature depressed, holding the valve seated, an electrical circuit through said magnet, and a switch in said circuit, said switch being adapted to be thrown by contact with said trip device for closing said circuit through said magnet for raising said armature and effecting the unseating of said valve.

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

FRANKLIN A. PIERCE.

Witnesses:

E. A. LENKARD,
H. E. DUNLAP.