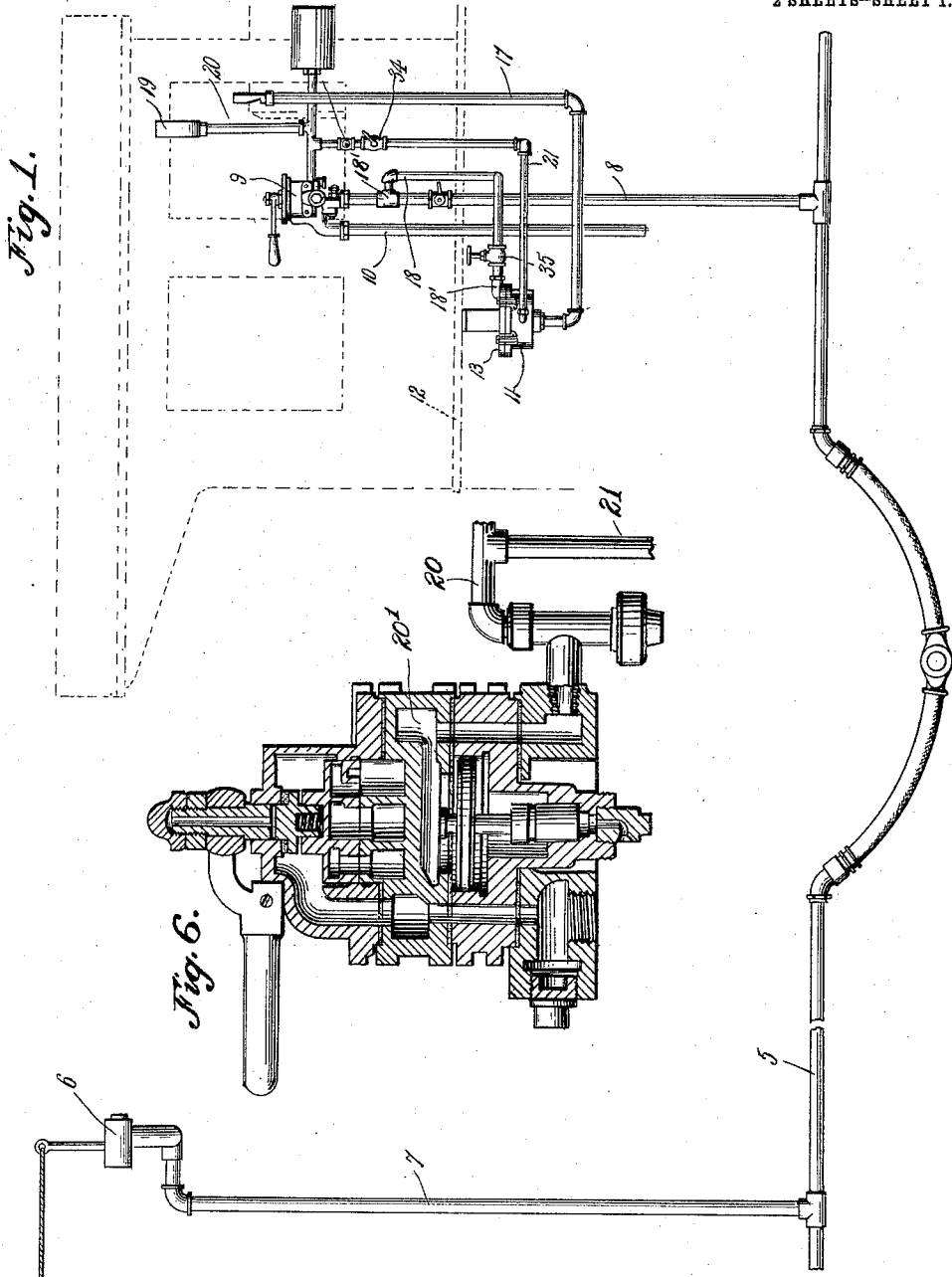


G. T. ROWTON.
PNEUMATIC SIGNALING SYSTEM.
APPLICATION FILED AUG. 2, 1909.

1,006,289.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 1.



Witnesses
John H. Crawford
John A. Donegan.

By

Charles Canale

Inventor
George T. Rowton,

Attorneys

G. T. ROWTON.
PNEUMATIC SIGNALING SYSTEM.
APPLICATION FILED AUG. 2, 1909.

1,006,289.

Patented Oct. 17, 1911.

2 SHEETS—SHEET 2.

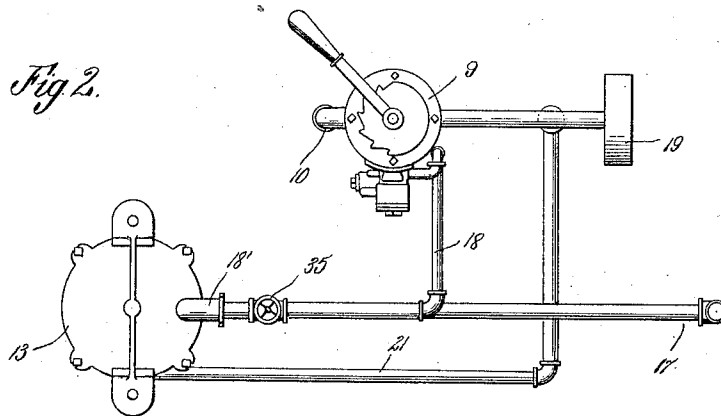


Fig. 3.

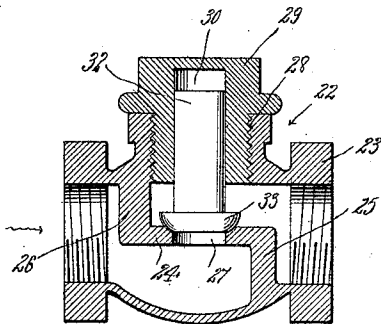


Fig. 4.

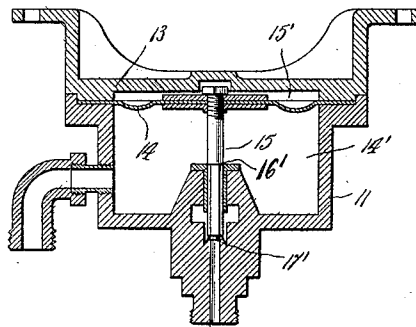
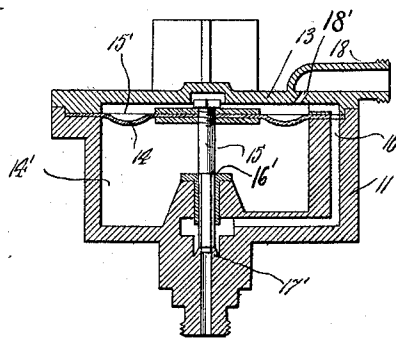


Fig. 5.



Inventor
George T. Rowton,

Witnesses
John H. Crawford
John A. Donagay,

By *Charles Chandler*

Attorneys

UNITED STATES PATENT OFFICE.

GEORGE T. ROWTON, OF JACKSON, MISSISSIPPI.

PNEUMATIC SIGNALING SYSTEM.

1,006,289.

Specification of Letters Patent.

Patented Oct. 17, 1911.

Application filed August 2, 1909. Serial No. 510,751.

To all whom it may concern:

Be it known that I, GEORGE T. ROWTON, a citizen of the United States, residing at Jackson, in the county of Hinds, State of Mississippi, have invented certain new and useful Improvements in Pneumatic Signaling Systems; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in signaling apparatus for use on railway trains and more particularly to that class of signaling apparatus operated by liquid pressure from the main reservoir.

It is well known that a separate system of train pipe and hose connections exist between what is known as the "conductor's valve" and signal whistle located on the engine, in most railway trains. Various methods have been attempted to eliminate this extra system including extra coils of pipes and valves, and to some extent these efforts have been successful. For the most part however, special equipment was needed in order to successfully carry out the idea. This requirement alone rendered the adoption of these devices impossible for the reason that considerable expense was necessary for installation.

The present invention aims at the production of a device wherein the separate system before referred to is eliminated and at the same time no new parts will be necessary in order to produce this result with the bare exception of a simple pipe connection between the signal valve and main reservoir connection, whereby the cost to install the invention will be reduced to a minimum and at the same time the extra expense now necessary to equip with the above referred to separate system will be saved.

With the above and other objects in view as will more fully hereinafter appear, the present invention consists in certain novel details of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings and more particularly pointed out in the appended claims; it being understood that various changes in the form, proportion, size and minor details of the device may be made

without departing from the spirit or sacrificing any of the advantages of the invention. 55

In the accompanying drawings forming part of the specification:—Figure 1 is a diagrammatic view of a portion of a signal system constructed in accordance with my invention. Fig. 2 is a plan view showing the connections between the signal valve, engineer's valve, train pipe, whistle and main reservoir. Fig. 3 is a detailed vertical sectional view of the check valve employed in the connection between the main reservoir line and signal valve casing. Fig. 4 is a vertical sectional view of the signal valve casing showing where the connection embodying the spirit of this invention is made with one chamber of the signal valve casing. Fig. 5 is a view similar to Fig. 4 but taken through another portion of the signal valve casing to show the by-pass in the latter communicating with the whistle pipe. Fig. 6 is a sectional view of the engineer's brake valve showing the connection to the gage pipe through the equalizing reservoir side of the valve and the connection of the signal valve pipe to the gage pipe. 60

Similar numerals of reference are employed to designate corresponding parts throughout. 80

The train pipe line is designated by the numeral 5 and places in communication as usual the main and auxiliary reservoirs of the brake system. As before stated, a separate system is usually employed between the conductor's valve and whistle. In the present instance it will be observed that the conductor's valve 6, located in the usual manner at the forward upper end of the car, is connected with the train pipe by a pipe section 7. This pipe section 7 is on all passenger cars and usually communicates with the separate system leading to the whistle. If desired this section 7 may be tapped directly into the train pipe line or if desired after the separate system has been removed, with the exception of the pipe 7, a branch connection may be established between the pipe train line and pipe 7. Thus it will be seen with the construction thus far described, that absolutely nothing new or expensive will be necessary to establish communication between the conductor's valve and train pipe. The forward portion of the train pipe line 105

is connected to the train pipe 8 carried by the engine, this latter connecting through the engineer's valve 9 with a pipe 10 leading to the main reservoir. Thus it will be seen that the circuit between the main reservoir and pipe line is controlled entirely by the engineer's valve 9.

The signal valve casing is designated by the numeral 11 and as usual depends from the running board 12. The casing is provided with a head 13, which is bolted or otherwise secured to the upper edge of the casing and between the said head and casing the peripheral portion of a diaphragm 14 is interposed. The diaphragm is formed of the usual fibrous material and is centrally provided with a valve 15. The latter is an elongated body and its lower half is non-cylindrical in contour and extends through a bushing formed on the central portion of the lower end of the casing which constitutes a seat for the valve. With the employment of the diaphragm it is evident that the interior of the casing will be divided into two compartments 14' and 15' and communication between these compartments is established by means of a by-pass 16, and a leakage supply groove 16', formed in the wall of the casing and the non-cylindrical portion of the stem respectively. The lower end of the by-pass terminates in an annular chamber at the outer end of the bushing. A whistle pipe 17 has one end suitably secured to a boss on the central portion of the lower end of the casing and surrounding the opening through which the end of the valve 15 extends. This boss is centrally provided with a bore, the inner end of which is provided with a nipple 17' which receives the reduced lower end of the valve 15 so that when the valve 15 is in its normal position communication between the whistle and chamber 15' of the signal valve casing will be cut off. When the diaphragm is moved upwardly and carries with it the valve 15 the latter will move from the nipple 17', whereby communication will be established between the chamber 15' of the casing and whistle pipe 17.

Communication between the train pipe 8 and the head 13 of the signal valve casing is established by means of a pipe section 18. The lower end of this pipe section 18 surrounds a bore 18' formed in the head 13 which communicates with the upper chamber 15' in the signal valve casing while the upper end of the pipe section 18 communicates, through the T 18', with the train pipe section 8.

The pressure gage is shown at 19, being connected to the equalizing reservoir side of the engineer's valve by means of a pipe section 20 which communicates with the chamber 20' of the valve as shown in Fig. 6.

The above referred to parts are of well

known structure and arrangement and while a detailed description of certain of these parts is given the sole purpose of this is merely to elucidate the operation and construction of what will presently appear.

By referring now to Fig. 1 it will be seen that communication between the pipe section 20 carrying the gage 19 and chamber 14' of the signal valve casing opposite to the chamber 15' in communication with the train-line, is established by means of what will subsequently be termed a gage pipe 21. The essence of this invention resides in this construction since with its provision the functions before referred to will be successfully accomplished. The lower end of the gage-pipe 21 is tapped into a portion of the wall of the signal valve casing remote from the by-pass 16 and the upper end, as shown in Fig. 1, is connected with the pipe 20 carrying the gage 19 or if desired this upper end may be tapped directly into the equalizing reservoir side of the engineer's valve. With this construction it is obvious when the system is charged with the ordinary pressure that the pressure on the opposite sides of the diaphragm will be equalized through the leakage groove 16', and the valve 15 will, by its own weight, be held on its seat and bear on the nipple 17'. With this in mind it is obvious that a reduction of pressure in the train pipe caused by the conductor's valve 6 will, through the connection 18, create a corresponding reduction in the chamber 15' of the signal valve casing, therefore the pressure in the opposite chamber will be slightly greater and this excess pressure bearing on the diaphragm 14 will move the latter sufficiently far to draw the valve 15 from its seat, whereby the air from the chamber 15' will pass through the by-pass 16 and into the whistle pipe 17 and sound the whistle. This reduction of pressure will not be sufficient to set the brakes since the quantity of air exhausted through the conductor's valve will be comparatively small and practice has demonstrated that this quantity will not be sufficient to move the brakes.

From the foregoing it is evident that the whistle can be sounded through the train pipe or in other words, operated in the same circuit with the brakes and it will be further observed when the brakes are to be applied by operating the engineer's valve 9 that a reduction of pressure will be first created in the chamber 14' by reason of the fact that this chamber is in communication through the pipe 21 with the equalizing reservoir, in which the first reduction of pressure is made in making a service application of the brake, whereby the valve stem 15 will be held to its seat by the excess pressure in the chamber 15'; as the application continues, air will be taken from the

chamber 15' and when the pressure in both chambers is equalized the valve 15 will, by its own weight, be held seated. When the application has been made and the pressure again brought to normal it is evident that the air entering the chamber 15' in the signal valve casing will bear on the diaphragm and tend to hold the rod 15 more firmly in its seat.

Up to this point so far as known no provision has been made for preventing the whistle to sound during the time the system is being brought to normal pressure, without the employment of expensive additions such as specific forms of whistle valves or signal valve casings and the like. The present invention therefore aims to remedy this defect by providing a check valve designated by the numeral 22. This member is located in the connection between the pipe 20 carrying the gage 19 and signal valve casing, and is arranged to open in one direction only. In Fig. 3 a detailed vertical sectional view of this check valve is given the casing of which is designated by the numeral 23. The casing is interiorly provided with a wall or partition. This partition or wall has a portion 24 parallel with the axis of the casing and formed on the opposite ends of the portion 24 are opposite extending extensions 25 and 26. These extensions 25 and 26 are secured to opposite sides of the casing 23 and the portion 24 is medially provided with an opening 27, whereby connection is established between the opposite sides of the casing. The casing is provided with a laterally interior threaded opening 28, which receives a threaded plug 29. The latter is centrally provided with an opening 30, in which is slidably fitted a plunger rod 32, one end of which is provided with a head 33 to enter and seal the opening 27 in the portion 24 of the wall. The rod 32 is of a length to permit the head 33 to be moved from engagement with the edge of the opening 27. Thus it will be seen when air enters the casing 23 in the direction of the arrow shown in Fig. 3 that it will pass beneath the portion 24 of the wall and lift the valve 33 and emerge from the opposite end of the casing. It is evident however, when air passes through the last-named end of the casing that it will be prevented from passing through the opposite end by virtue of the head 33 being forced into its seat. This check valve is so positioned that air may flow from the chamber 14' through the pipe 21 and thence out through the chamber 20' in the brake valve as previously described, but will be prevented from passing in the reverse direction, or in other words the pressure in the chamber 14' may be reduced through the engineer's valve to prevent the whistle sounding during service application but the pressure in this chamber may only be raised

through the by-pass 16 and through the leakage groove 16'. It will thus be seen that the diaphragm may be actuated only by a train-line reduction unaccompanied by an equalizing reservoir reduction, since under all other conditions the pressure in the chamber 14' will remain less than or equal to that in the chamber 15'.

A cut-off valve 34 is located in the by-pass 21 and serves as a means for breaking the circuit when any part of the whistle valve is to be repaired. A similar cut-off valve 35 is located in the pipe 18 leading to the chamber 15' of the signal valve and this valve may be closed when two engines are coupled together and the whistle in one of said engines is to be used.

From the foregoing it can be seen that I have provided a device which is comparatively simple in structure and inexpensive to manufacture, embodying few parts and these so arranged that the danger of derangement will be reduced to a minimum.

What is claimed as new, is:—

1. In a pneumatic signaling system, a pneumatically operated signal, a controlling valve for said signal, a train-line, an equalizing reservoir, and means operatively connected with said controlling valve whereby reduction in the train-line pressure unaccompanied by reduction of the equalizing reservoir pressure will operate said controlling valve to admit train-line air to said signal.

2. In a pneumatic signaling system, a pneumatically operated signal, a train-line, a conduit connecting said train-line with said signal, a valve interposed in said conduit, a plurality of pressure chambers, a movable partition separating said chambers, means for operatively connecting said partition and said valve, an equalizing reservoir, a conduit connecting one of said pressure chambers with the equalizing reservoir, and a conduit connecting the other of said pressure chambers with the train line.

3. In a pneumatic signaling system, a pneumatically operated signal, a train-line, a conduit connecting said train-line with said signal, a valve interposed in said conduit, a plurality of pressure chambers, a movable partition separating said chambers, means for operatively connecting said partition and said valve, a leakage connection between said chambers for effecting a relatively slow equalization of pressures therein, a conduit connecting one of said pressure chambers with the equalizing reservoir, a check valve interposed in said conduit, and a conduit connecting the other of said pressure chambers with the train-line.

4. In a pneumatic signaling system, a pneumatically operated signal, a train-line, a conduit connecting said train-line with said signal, a valve interposed in said con-

duit, a plurality of pressure chambers a diaphragm secured to the stem of said valve and separating said chambers, a leakage connection between said chambers for effecting
5 a relatively slow equalization of pressure therein, a conduit connecting one of said pressure chambers with the equalizing reservoir, a check valve interposed in said conduit and adapted to prevent the flow of air

from said reservoir to said chamber, and a 10 conduit connecting the other of said pressure chambers with the train-line.

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

GEORGE T. ROWTON.

Witnesses:

L. N. GILLIS,
Jos. GREGORY.

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