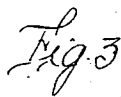
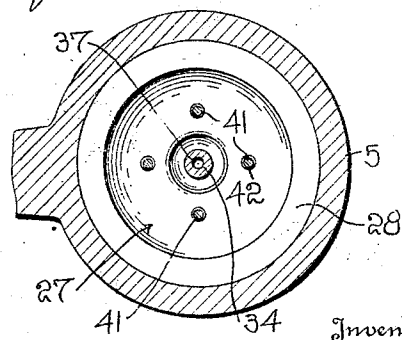


1,304,162.

2 SHEETS—SHEET 1.



Inventor

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By *Watson E. Coleman*

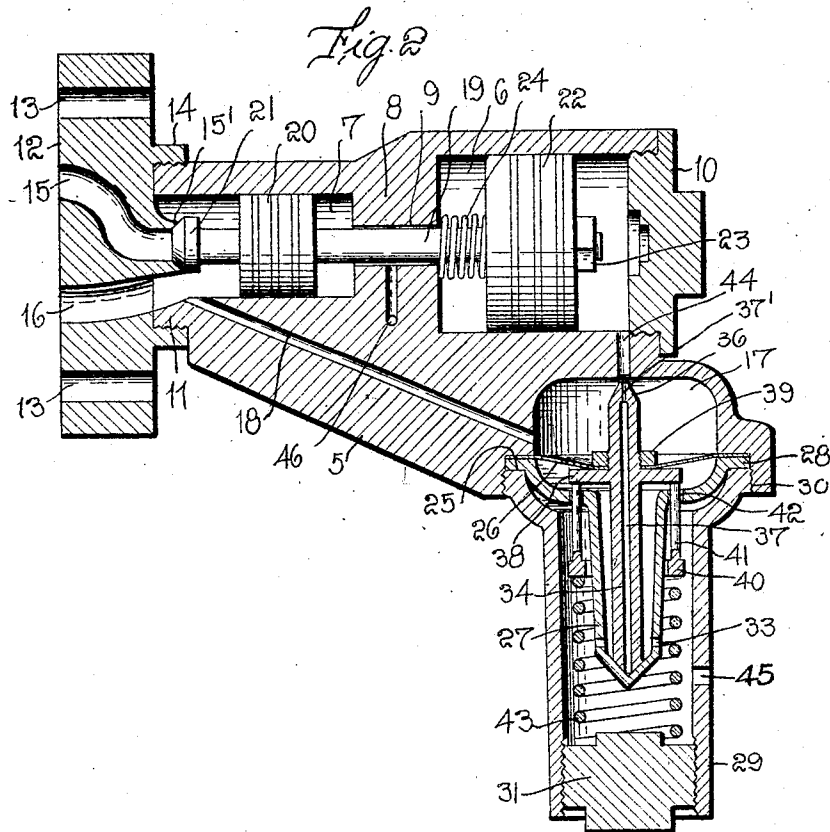
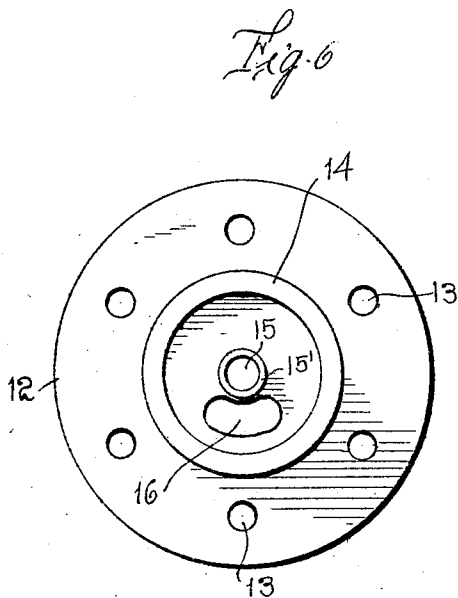
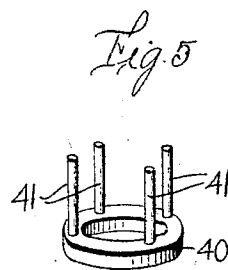
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J. W. DE SCHAMPS.
AIR PRESSURE GOVERNOR FOR AIR BRAKE SYSTEMS.
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1,304,162.

Patented May 20, 1919.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN W. DE SCHAMPS, OF MUSKOGEE, OKLAHOMA.

AIR-PRESSURE GOVERNOR FOR AIR-BRAKE SYSTEMS.

1,304,162.

Specification of Letters Patent.

Patented May 20, 1919.

Application filed March 23, 1918. Serial No. 224,289.

To all whom it may concern:

Be it known that I, JOHN W. DE SCHAMPS, a citizen of the United States, residing at Muskogee, in the county of Muskogee and State of Oklahoma, have invented certain new and useful Improvements in Air-Pressure Governors for Air-Brake Systems, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved governor for air brake systems and has for its primary object to provide simple and reliable means for automatically maintaining a uniform air pressure in the train line pipe.

It is a more particular object of the invention to provide in a device for the above purpose, a piston actuated valve controlling the supply of air from the main reservoir to the train line pipe and a variable air pressure actuated valve for automatically controlling the admission of air to the valve piston chamber whereby the valve is moved to its closed position when the maximum air pressure has been supplied to the train line pipe, said latter valve being constructed to exhaust the air from the piston chamber when the valve is in its normal position.

It is a further general object of my invention, to provide an air pressure governor and regulator of the above character which consists of relatively few elements of simple form so that the device will not be liable to get out of order, and can be manufactured and applied to either the New York or Westinghouse air brake systems at comparatively small cost.

With the above and other objects in view the invention consists in the improved combination, construction and relative arrangement of the several parts as will be hereinafter more fully described, subsequently claimed and illustrated in the accompanying drawings, wherein;

Figure 1 is a longitudinal sectional view of an air pressure governor constructed in accordance with the preferred embodiment of the invention and showing the several parts in their normal positions;

Fig. 2 is a similar view illustrating the relative positions of the parts after the brake cylinder pipe has been charged to maximum air pressure;

Fig. 3 is a section taken on the line 3—3 of Fig. 1;

Fig. 4 is a section taken on the line 4—4 of Fig. 1;

Fig. 5 is a detail perspective view of the spring pressed valve member; and

Fig. 6 is a detail elevation of the attaching plate for the governor showing the arrangement of the ports therein.

Referring in detail to the drawings, 5 designates the body of the device which is in the form of a metal casting having a cylindrical piston chamber 6 opening upon one end of said casting and a second piston chamber 7 of relatively small diameter opening upon the opposite end of the casting. The inner ends of these piston chambers are separated by the wall or web 8 having an opening 9 therethrough in coaxial relation to the piston chambers. At the open end of the larger piston chamber 6, the chamber wall is interiorly threaded to receive a detachable head or closure cap 10. At the open end of the smaller chamber 7, the body or casting 5 is formed with an exteriorly threaded nipple or flange 11.

The supporting bracket or plate 12 is provided with a plurality of openings 13 to receive suitable bolts or studs whereby said plate may be securely attached to a stationary part. This supporting plate 12 has a laterally projecting annular flange 14 formed upon one face thereof in substantially concentric relation to the periphery of the plate, said flange being interiorly threaded for the connection of the threaded nipple or flange 11 thereto. The plate 12 is also formed with a curved port 15 extending transversely therethrough and opening at one of its ends upon the side face of the plate 12 in concentric relation to the flange 14. This face of the plate 12 has a laterally projecting valve seat 15' formed thereon surrounding the port 15. A second port 16 is also formed in the plate 12, said port being slightly elongated and of appreciably greater dimensions than the port 15, as clearly indicated in Fig. 6 of the drawing. This port likewise opens into the smaller piston chamber of the body 5. The port 15 is connected to the main air supply reservoir of the air brake system, while the train line pipe, is connected to the port 16.

The body or casing 5 is also formed with an air receiving chamber 17 adjacent to the larger piston chamber 6, and this chamber 17 is connected by means of the duct or pas-

sage 18 to the smaller piston chamber 7 adjacent to its outer end.

19 designates the valve stem operating through the bore or opening 9 in the wall 8, and with this stem the piston 20 is integrally formed and reciprocates in the smaller chamber 7. The piston 20 is disposed in spaced relation to one end of the stem 19, upon which a valve disk 21 is integrally formed for engagement upon the seat 15' which surrounds the air inlet port 15. A relatively large piston 22 reciprocates in the chamber, said piston being engaged upon the opposite end of the valve stem 19, which is tapered as shown. A nut 23 threaded upon the extremity of the valve stem, securely retains the piston in position and prevents longitudinal shifting movement thereof. Between this piston 22 and the inner end wall of the chamber 6, a coil spring 24 surrounds the valve stem 19. At the outer open side of the chamber 17, the casting or body 5 is formed with an annular shoulder indicated at 25. A flexible diaphragm 26, preferably of sheet brass, is seated at its marginal edge upon this shoulder. A bell shaped casting 27 is provided at its mouth with an outwardly projecting annular flange 28 adapted for engagement upon the edge of the diaphragm 26. A shell or casing 29 has threaded engagement at one of its ends, as shown at 30 in the casting 5 and is adapted for clamping engagement upon the flange 28, whereby the casting 27 and the diaphragm 26 are securely held in place against relative shifting movement. The opposite end of the casing 29 is interiorly threaded to receive an adjustable plug 31 for a purpose which will presently appear.

40 The tubular shank or stem of the bell shaped casting 27 is tapered at its closed end to provide an internal valve seat indicated at 32, and adjacent to this seat, the wall of said stem is provided with a plurality of air escape ports 33. 34 designates a valve stem having its opposite ends tapered, as shown at 35 and 36 respectively. This stem is formed with a longitudinal bore or passage 37, which at the tapered end 36 of the valve stem is contracted or reduced in diameter as at 37'. A flange or disk 38 is integrally formed with the valve stem 34, and is engaged against the outer face of the diaphragm 26. A nut 39 is threaded upon the stem and has clamping engagement against the opposite side face of the diaphragm whereby the valve stem is securely held in position against axial shifting movement through the diaphragm 26.

60 In Fig. 5 of the drawings I have shown in detail the spring pressed member whereby the valve stem 34 is yieldingly held in its normal position, and this member includes an annulus 40 surrounding the tubular shank of the casting 27 and with which a

plurality of spaced arms 41 are integrally connected at one of their ends. These arms are loosely engaged through openings 42 provided in the wall of the casting 27 and are held at their other ends in bearing contact with the flange or disk 38 at the outer edge of the latter by means of the coil spring 43 which surrounds the tubular shank of the casting 27 and is engaged at one of its ends with the annulus 40 and at its other end with the plug 31. It will be readily seen that by the adjustment of this plug in the end of the casing 29, the tension of said spring may be varied as desired.

The chamber 17 in the body or casing 5 is connected to the larger piston chamber 6 adjacent the outer end thereof by the duct or passage 44 formed in said body. The tapered end 36 of the valve stem 34 is normally engaged in one end of this passage to close communication between the piston chamber 6 and the chamber 17, and in such position of the valve stem, it will be obvious that the other tapered end 35 thereof is spaced from the seat 32 so that this end of the bore 37 of the valve stem is in open communication with the interior of the hollow shank of the casting 27. Air entering the casing 29 through the ports 33 is exhausted to the atmosphere through one or more ports 45 in the wall of said casing.

For the purpose of exhausting such air as may escape around the pistons 20 and 22 to the inner ends of the respective chambers 7 and 6, I provide a passage 46 in the body or casing 5 which communicates at one of its ends with the opening 9 through which the valve stem 19 extends, and at its other end is open to the atmosphere.

In the operation of my invention, as above described, air enters from the main supply reservoir through the port 15 into the piston chamber 7, and passes from this chamber through the port 16 into the train line pipe. At the same time, air will pass through the duct or passage 18 into the chamber 17. The air continues to flow into the train line pipe and the chamber 17 until the desired maximum pressure for which the spring 43 has been properly adjusted is attained. At this time, the air pressure in chamber 17 acting upon the diaphragm 26, flexes the latter and overcomes the pressure of the spring 43, shifting the annulus 40 and the arms 41 longitudinally upon the casting 27. As this movement is transmitted through the disk 38 fixed on the valve stem, said stem is also moved longitudinally and its end 36 disengaged from the end of the passage 44 while at the same time the opposite end of the valve stem is tightly engaged on the seat 32 while this end of the bore 37 through the stem is closed. Air under maximum pressure will thus enter from the chamber through passage 44 into

the chamber 6 behind the piston 22 and will shift said piston longitudinally against the action of the spring 24. The piston 20 is thus also moved in the chamber 7 and the
 5 valve disk 21 engaged upon the seat 15' to cut off the further supply of air from the main reservoir to the train line pipe. As the piston chamber 6 is of relatively large diameter, air in relatively large volume will
 10 enter said chamber and thus overcome the air pressure in the relatively small piston chamber 7. Also by providing the port 16 of larger area than the inlet port 15, the air will flow from the chamber 7 into the
 15 train line pipe much more rapidly than the air enters said chamber from the reservoir. In this manner I also avoid a temporary high pressure in the duct or passage 18 before the train line pipe has been fully
 20 charged. After the governor device has been actuated in the manner just explained, the several parts are in the relative positions, seen in Fig. 2 of the drawings.

After the brakes have been actuated and
 25 the air pressure in the train line pipe is reduced below the maximum pressure, the pressure in chamber 17 is, of course, correspondingly reduced and the spring 43 then acts to overcome the pressure on the diaphragm 26 and return the diaphragm and
 30 the valve stem 34 connected thereto to their normal positions, thus again seating the end 36 of the valve stem in the end of the passage 44 and disengaging the opposite end of said
 35 stem from the seat 32. Air from the reservoir again entering the chamber 7 acts against the piston 20 and in conjunction with the spring 34 returns said piston and the piston 22 to their normal positions. The
 40 air behind the piston 22 is forced out through passage 44 into the contracted end 37' of the bore in the valve stem and through said bore into the lower end of the tubular casting 27, from which it escapes through
 45 the ports 33 and the port 45 in the casing 29 to the atmosphere. When the train line pipe has again been charged to the maximum pressure, the operation above described is repeated.

Preferably, the valve stem 34 will be provided with a square or rectangular portion immediately adjacent to the disk 38 so that a wrench or other tool can be conveniently applied for the purpose of turning the same
 55 to grind the end 35 thereof upon the seat 32. The other end 36 of the stem may be ground upon the seat at the end of the passage 44 by applying the wrench to the clamping nut 39.

From the foregoing description taken in connection with the accompanying drawings, it is believed that the construction, manner of operation and several advantages of my invention will be clearly and fully understood. The governor device provides

simple and positively operating means for maintaining at all times a uniform air pressure in the train line pipe so that the complete and effective operation of the brakes is assured. By venting or exhausting the
 70 air from the main valve piston chamber through the movable valve stem 34, as above explained, the possibility of failure in the recharging of the train line pipe is obviated. The several parts of my improved governor
 75 can be very easily and quickly assembled and access may also be readily had thereto for the purpose of repairing or renewing any of the parts. Of course it will be understood that at the several joints or connections between the detachable body portions of the device, suitable packing means may be provided to effectually prevent the escape of air. The improved governor as
 80 a whole, consists of comparatively few elements which are of very simple form so that the device can be produced at very small cost and installed in either the Westinghouse or New York air brake systems, without necessitating any material modifications of such systems.

While I have herein shown and described the preferred construction and relative arrangement of the various parts of the device, it is to be understood that the same
 95 are susceptible of considerable modification and I therefore reserve the privilege of adopting all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed. 100

Having thus fully described my invention, what I desire to claim and secure by Letters Patent is:

1. In a pressure governor for air brake systems, a body having two piston chambers
 105 of relatively different diameters, means connecting the smaller chamber to the air supply reservoir and train line pipe of the air brake system, a piston in each of said chambers, a valve connected to and movable with said
 110 pistons, said body being further provided with an air receiving chamber in communication with the respective piston chambers, a spring pressed valve element operating in the air receiving chamber and normally closing
 115 communication between the same and the larger piston chamber, means operatively connected to the valve element and acted upon by air pressure in said receiving chamber to move the valve to open position and
 120 permit the air at reservoir pressure to enter from said chamber into the larger piston chamber whereby the valve is moved to close communication between the reservoir and the train line pipe, said valve having an air
 125 eduction port in communication with the larger piston chamber in the normal position of the valve to exhaust the air from said chamber to the atmosphere upon the return of the piston to its normal position, 130

and a relatively stationary part coacting with the valve when the latter is moved to its open position to close communication between said eduction port and the atmosphere.

5 2. In a pressure governor for air brake systems, a body having two piston chambers of relatively different diameters, means connecting the smaller chamber to the supply
10 reservoir and the train line pipe of the air brake system, a piston in each of said chambers, a valve connected to and movable with said pistons, said body being further provided with an air receiving chamber in
15 communication with each of said piston chambers, a flexible diaphragm at one side of the air receiving chamber, a valve stem secured to the diaphragm and normally held by the diaphragm in position to close communication between said chamber and the
20 larger piston chamber, a stationary part, a casing detachably connected to said body and holding said stationary part and the diaphragm against relative movement, a member longitudinally movable upon the stationary
25 part, a spring coacting with said member and urging the same toward the diaphragm to resist flexing of the diaphragm under the air pressure in said chamber, and means for varying the tension of said spring.
30 3. In a pressure governor for air brake systems, a body having two piston chambers of relatively different diameters, means connecting the smaller chamber to the supply
35 reservoir and the train line pipe of the air

brake system, a piston in each of said chambers, a valve connected to and movable with said pistons, said body being further provided with an air receiving chamber in communication with each of said piston chambers, a flexible diaphragm at one side of the
40 air receiving chamber, a valve stem secured to the diaphragm and normally held by the diaphragm in position to close communication between said chamber and the larger
45 piston chamber, a stationary part, a casing detachably connected to said body and holding said stationary part and the diaphragm against relative movement, a member longitudinally movable upon the stationary
50 part, a spring coacting with said member and urging the same toward the diaphragm to resist flexing of the diaphragm under the air pressure in said chamber, said valve member having an air eduction port, said
55 port communicating with the piston chamber in the normal position of the valve member to exhaust the air from said chamber and said valve member engaging the stationary part when said valve member is
60 actuated to close communication through said port between the air receiving chamber and the atmosphere, and means for varying the tension of said spring.

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

JOHN W. DE SCHAMPS.

Witnesses:

ENNIS E. WILSON,
A. J. EDMONDSON.

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