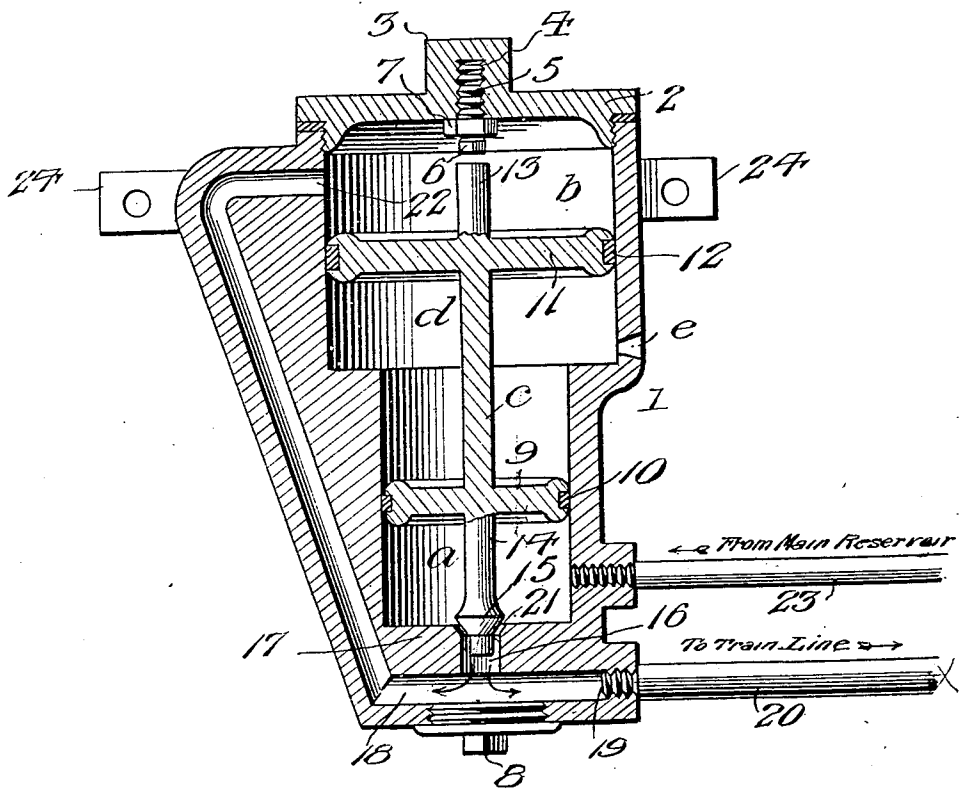


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J. W. RICHARDSON.  
AUTOMATIC GOVERNOR FOR AIR BRAKE SYSTEMS.  
APPLICATION FILED FEB. 5, 1907.



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Witnesses  
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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC GOVERNOR FOR AIR-BRAKE SYSTEMS.

No. 869,731.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed February 5, 1907. Serial No. 355,859.

*To all whom it may concern:*

Be it known that I, JOSEPH W. RICHARDSON, a citizen of the United States of America, residing at Cumberland, in the county of Allegany and State of Maryland, have invented new and useful Improvements in Automatic Governors for Air-Brake Systems, of which the following is a specification.

This invention relates to automatic governors for air brake systems, and one of the principal objects of the same is to provide reliable and efficient means for maintaining a predetermined pressure in the train line relatively to the pressure in the main reservoir.

Another object of my invention is to provide an automatic governor for air brake systems which shall be simple in construction, composed of comparatively few parts, which cannot get readily out of order, and which will operate efficiently under varying conditions.

Still another object of the invention is to provide a governor of the character referred to, in which access may be readily had to the interior of the governor casing, and in which provision is made for adjustment to control the movement of the piston rod.

These and other objects may be attained by means of the construction illustrated in the accompanying drawing in which the figure represents a central vertical section taken through the governor.

Referring to the drawing for a more particular description of my invention, the numeral 1 designates a casing provided with a screw cap 2 which closes one end of the casing, said cap being fitted to the casing by an air-tight joint, and provided with an extending boss 3 which is internally screw threaded, as at 4, to accommodate a set screw 5, said set screw having a projecting end 6 and a squared portion 7 for accommodation of a wrench in adjusting said set screw. At the opposite end of the casing 1 a threaded plug 8 is provided for giving access to the interior of the casing at this end thereof. Inside the casing is a chamber *a* and an enlarged chamber *b*. A piston rod *c* is mounted in these chambers, said piston rod carrying a piston head 9 provided with packing 10 and fitted within the chamber *a* in an air-tight manner. Carried by the piston *c* is an enlarged piston head 11, also provided with packing 12, and fitted in the chamber *b* in an air-tight manner. The piston *c* is provided with a projection 13 at one end, and at its opposite end with a similar projection 14 which terminates in a conical valve head 15. An opening 16 in the partition 17 in the casing communicates with an air passage 18 extending out through the casing, as at 19, and the train line pipe 20 is connected to this opening. A valve seat 21 is formed in the partition 17 to accommodate the conical valve 15. The air passage 18 extends upward through the casing, and communicates at its upper end 22 with the larger chamber *b* in the casing. A pipe leading to the main reservoir is con-

nected to the casing and communicates with the smaller chamber *a*, said pipe being designated 23. Perforated lugs 24 formed on or secured to the casing 1 are provided for supporting the governor in any suitable position for use. At a point intermediate the chambers *a* and *b* is an intermediate equalizing chamber *d*, provided with an opening *e* which communicates with the outer atmosphere. It will be understood that the pipe 23 and the train line pipe 20 are connected to the engineer's equalizing discharge valve in the locomotive, and through said discharge valve to the main reservoir and to the train line.

The operation of my invention may be described as follows: For the purpose of illustration it may be supposed that there are one hundred pounds pressure per square inch in the main reservoir, and air from this reservoir communicates through pipe 23 with chamber *a*, and this pressure raises the piston head 9, and the conical valve 15 to open the port 16 to permit the air to flow to the train line pipe 20, and also to pass up through the passage 18, and discharge at 22 into the enlarged chamber *b* above the piston head 11. Owing to the difference in area between the piston head 11 and piston head 9, the pressure upon the top of the piston 11 will force the valve 15 to its seat, thus seating valve 15 and closing port 16, and thus maintaining a predetermined pressure in the train line dependent upon the relative sizes of the piston heads 9 and 11. When the pressure in the train line is reduced either by leakage or by setting the brakes, the pressure in chamber *a* again raises the piston head 9 and opens communication between said chamber and the train line, and between said chamber and the chamber *b* through the passage 18 until the pressure in chamber *b* overcomes the pressure in chamber *a* owing to the difference in area of piston head 11, and again closes the valve 15.

By adjusting the set screw 7, the throw of the piston rod *c* is regulated to permit the valve head 15 to move relatively to its seat, more or less, to permit greater or lesser escape of air through the opening 16. The cap 2 can be removed from the casing and the plug 8 may also be removed for the purpose of cleaning or repairs.

As shown in the drawing the relative sizes of the piston head 9 and 11 will maintain a pressure of seventy pounds per square inch in the train line, provided the main reservoir pressure is one hundred pounds per square inch, but it will be obvious that any required difference in percentage may be attained by regulating the sizes of the piston heads to conform to the relative pressures desired.

Having thus described the invention, what I claim is:

1. A governor for air brake systems comprising a casing provided with air chambers of different cross sectional area, and an air passage extending into the bottom of

the casing and communicating with one of the chambers in said casing, a piston provided with piston heads mounted to move in said chambers, said pistons having a valve head thereon adapted to engage a valve seat in an opening through said casing which communicates with said air passage, a train line pipe communicating with said air chamber of greater cross sectional area to move the piston and seat the valve after pressure from the main reservoir unseats the valve.

10 2. A governor comprising a casing provided with chambers of different cross-sectional areas, and an intermediate balancing chamber open to the atmosphere, a piston

mounted in said casing and provided with heads fitting the inner walls of said chambers, a valve on the piston, a valve seat in the casing, a screw cap fitting one end of the casing, a set screw mounted underneath said cap, and adapted to be adjusted to limit the action of said piston, and a plug fitted to the opposite end of the casing to give access to the valve seat, substantially as described.

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

JOSEPH W. RICHARDSON.

Witnesses:

JOHN L. FLETCHER,  
RUFUS E. WEIMER.