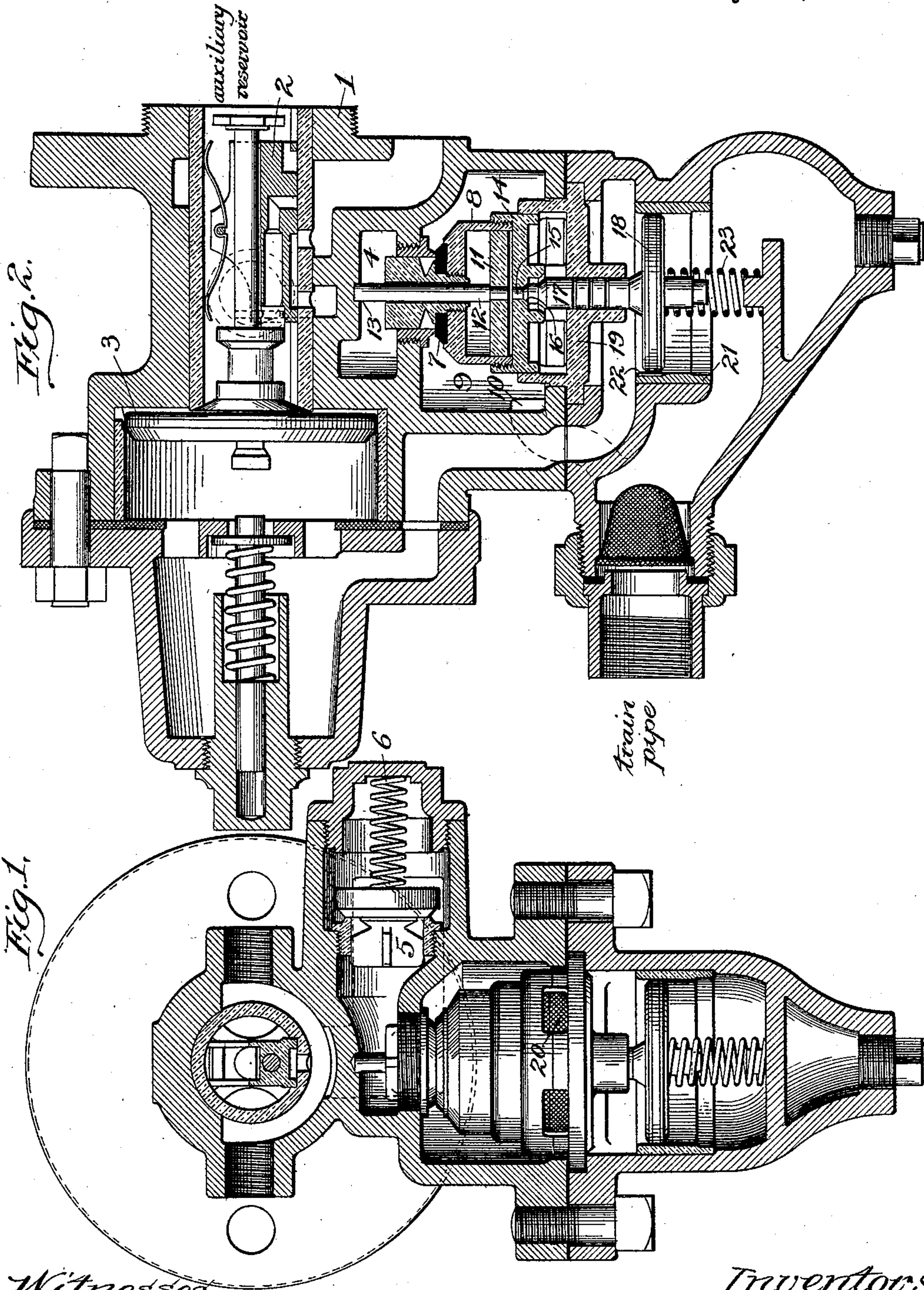


(No Model.)

J. T. & G. W. HAYDEN.  
AIR BRAKE TRIPLE VALVE.

No. 587,054.

Patented July 27, 1897.



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# UNITED STATES PATENT OFFICE.

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## AIR-BRAKE TRIPLE VALVE.

SPECIFICATION forming part of Letters Patent No. 587,054, dated July 27, 1897.

Application filed December 3, 1896. Serial No. 614,389. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES T. HAYDEN and GEORGE W. HAYDEN, citizens of the United States, residing in Oak Park, Cook county, Illinois, have invented certain new and useful Improvements in Air-Brake Triple Valves, of which the following, taken in connection with the accompanying drawings, is a specification.

Our invention relates more particularly to that portion of the air-brake triple valve which is known as the "quick-action" or "emergency" mechanism.

In all devices of this class it is necessary that the emergency port or opening, whether it leads from the train-pipe into the brake-cylinder or to the atmosphere, be of large capacity in order to insure sufficient quickness of action, and this in turn necessitates the use of a valve of considerable size to control such large opening. As the normal pressure usually carried in the pipes is about seventy pounds it is obvious that to pull the emergency-valve away from its seat against this heavy pressure requires the exercise of considerable force and must necessarily to a greater or less extent retard the quickness of operation of the mechanism on each car and consequently the rapidity of the application throughout the train.

Constructions have been heretofore proposed in which the usual form of puppet-valve has been replaced by a slide-valve under the impression that this might reduce the force necessary to unseat the same. Such construction, however, is open to serious objections, particularly because of the liability of the seat of the slide-valve to become corroded and interfere with the free return of the valve after it is opened and consequently obstruct the release of the brakes.

In the practice of our invention we aim to overcome the above-mentioned objections by providing as an aid in the operation of the emergency-valve a novel arrangement of abutment, which we shall hereinafter term a "balancing-piston."

Our invention consists, further, in certain details of construction and combination of parts to be hereinafter specifically pointed out in the claims, which we will now proceed

to describe more in detail, reference being had to the accompanying drawings, in which—

Figure 1 represents a transverse vertical section through a triple valve embodying our improvements. Fig. 2 represents a longitudinal vertical section of the same.

Referring now more particularly to Fig. 2, it will be seen that in the upper part of the body or casting 1 is provided a slide-valve 2 and connected piston 3 of the usual well-known type; but as these parts both in construction and method of operation are substantially identical with those well known in the art we shall not enter into any detailed description of them here. The connections to the auxiliary reservoir and train-pipe are also made as in the form of construction most commonly used, and are for convenience of reference lettered on the drawings. The chamber or cavity 4 is preferably connected to the brake-cylinder through a passage in which is situated the check-valve 5, held against its seat by the spring 6; but such connection is not essential to our invention, as our improvement could also be used in conjunction with an emergency-valve designed to discharge to the atmosphere.

Controlling the emergency port or opening in the chamber 4 is an emergency-valve 7, attached to a hollow cylindrical casing 8, operating in a chamber 9, which is in direct communication with the train-pipe by means of the passage 10.

Within the hollow casing 8 is arranged a balancing-piston 11, having a stem 12, which passes through the center of the emergency-valve and abuts against the casting at 13 in a manner clearly shown in the drawings. Covering the end of the casing 8 is a cap 14, through the center of which is a port 15, controlled by a supplemental valve 16 on the end of the stem 17 of the supplemental piston 18. As a guide for the stem 17 and also for the cap 14 of the casing 8, we provide a removable partition 19, having around its upper cylindrical portion openings 20, (shown in Fig. 1,) for the purpose of establishing free communication between the chamber 9 and the under side of the cap 14.

In the side of the bushing 21, in which the piston 18 operates, is provided a by-pass port



22, through which air may pass in and out to the main piston 3 for the application of the brakes in service application and release. Bearing against the under side of the piston 18 we provide a spring 23 for the purpose of holding the parts in the position shown in the drawings and returning them to such position after an emergency application has been made. If now it be desired to make an emergency application of the brakes, a sudden and extreme reduction is made in the train-pipe pressure. This causes the air above the piston 18 to exert a downward force upon the same, which by unseating the supplemental valve 16 admits pressure from the train-pipe into the space between the piston 11 and the cap 14. As the piston 11 abuts by its stem 12 against the casting at 13 the pressure so admitted exerts a downward force upon the cap 14, balancing the air-pressure on the under side of the cap, and thereby permitting the air in the train-pipe or chamber 9 to operate against the emergency-valve casing 8 to pull the emergency-valve away from its seat.

When the pressure surrounding the various parts has become equalized, the spring 13 returns them all to the position shown in the drawings, (there being sufficient leakage around the piston 11 to permit of this,) closing the emergency discharge-port and also the port controlled by the supplemental valve 16 and reopening the by-pass port 22 for the passage of air to the main piston.

The check-valve 5 is only to be used when the discharge is into the brake-cylinder, and it performs the function of preventing any escape of brake-cylinder pressure back to the train-pipe after the brake has been applied.

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

1. In emergency-valve mechanism for air-brake triple valves, the combination of an emergency-port, an emergency-valve controlling said port, a hollow cylindrical casing attached to said emergency-valve, a piston located within said cylindrical casing, abutting against the triple-valve casing, a supplemental port leading from the train-pipe to said piston, a supplemental valve controlling

said supplemental port and a supplemental piston for operating said supplemental valve, arranged and combined substantially as shown and described.

2. In emergency-valve mechanism for air-brake triple valves, the combination with an emergency-port, an emergency-valve controlling said port, an emergency-piston for operating said emergency-valve, and a supplemental valve and piston cooperating with said emergency-valve, of a balancing-piston constructed to act with said emergency-piston to open the emergency-valve, substantially as described.

3. In emergency-valve mechanism for air-brake triple valves the combination with the triple-valve body, containing an emergency-port, an emergency-valve, a cylindrical casing attached to said emergency-valve and a supplemental valve and piston coacting with said parts, of a balancing-piston within said emergency-valve casing, having a stem abutting against said triple-valve body, substantially as described.

4. In emergency-valve mechanism for air-brake triple valves, the combination with an emergency-port, an emergency-valve, a cylindrical casing attached to said emergency-valve, and a supplemental valve and piston coacting with said parts, of a balancing-piston within said emergency-valve casing having a stem passing through said emergency-valve and abutting against the triple-valve body, substantially as described.

5. In emergency-valve mechanism for air-brake triple valves, the combination with an emergency-port, an emergency-valve, a cylindrical casing attached to said emergency-valve, a cap closing one end of said cylindrical casing, a supplemental port through said cap, a supplemental valve for controlling said supplemental port and a supplemental piston for operating said supplemental valve, of a balancing-piston contained within said emergency-valve casing, abutting against the triple-valve body, substantially as described.

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