

UNITED STATES PATENT OFFICE.

ROBERT H. BLACKALL, OF EDGEWOOD PARK, PENNSYLVANIA, ASSIGNOR
TO THE WESTINGHOUSE AIR BRAKE COMPANY, OF PITTSBURG, PENN-
SYLVANIA, A CORPORATION OF PENNSYLVANIA.

TRIPLE VALVE.

No. 851,273.

Specification of Letters Patent.

Patented April 23, 1907.

Application filed June 13, 1903. Serial No. 161,295.

To all whom it may concern:

Be it known that I, ROBERT H. BLACKALL, a citizen of the United States, residing in Edgewood Park, county of Allegheny, State of Pennsylvania, have invented a certain new and useful Improvement in Triple Valves, of which improvement the following is a specification.

This invention relates to triple valves for automatic fluid pressure brakes, and more particularly to that class or type known as quick action triple valves, in which a local venting of the train pipe occurs upon each car in emergency applications.

With the present standard quick action air brake apparatus the equalized pressure in the brake cylinder and auxiliary reservoir in emergency applications is somewhat greater than that remaining in the train pipe owing to the local venting of the train pipe. For this reason it has been difficult to secure a quick release of the brakes after an emergency application, since a greater amount of air has been required to be supplied from the main reservoir to the train pipe in order to raise the pressure therein sufficiently above that in the auxiliary reservoir to cause the movement of the triple valves to release position, thus requiring a longer period of time, as well as an additional amount of air, to effect the release.

The object of my present invention is to provide an improved construction of triple valve device by means of which the release of the brakes may be readily and promptly effected after an emergency application, and also whereby the brakes are held applied and the escape of air under pressure from the brake cylinder and auxiliary reservoir may be prevented in case of an emergency application resulting from a bursted hose or other accident causing a complete venting of the train pipe to the atmosphere.

In the accompanying drawing the figure shows in central vertical section a quick action triple valve device provided with my improvement.

As herein illustrated the valve casing contains the usual quick action triple valve parts, such as the triple piston 1, stem 2,

slide valve 3, graduating valve 4, emergency piston 5, emergency valve 6, and check valve 7, the nozzle 8 being connected to the train pipe, the port 9 to the brake cylinder and the valve chamber 10 to the auxiliary reservoir, all of which corresponds with the Westinghouse standard triple valve construction, the operation of which is well understood by all familiar with the art.

In the cap 11 of the valve casing, containing the graduating stem 12 and graduating spring 13, I provide an additional spring 14 bearing against the cap 15 and normally holding the same against the stop flange 16 of guide cylinder 17 supported by or formed integral with the cap. The spring cap 15 is held in such a position as to be engaged by the shoulder 18 of the graduating stem 12 when the same is forced back to its normal emergency position by the triple valve piston.

In the bushing 19 of the triple valve piston chamber and near its outer edge is formed a small groove 20, in such position as to allow a leakage of air around the piston when the same is moved to its ordinary or normal emergency position, as indicated in dotted lines in the drawing. When the triple piston is in this position the shoulder 18 is just touching the spring cap 15 which holds the triple piston 1 a slight distance away from the gasket 21 and allows a slow leakage of air from the auxiliary reservoir to the train pipe for the purpose of establishing an equalization of these pressures after an ordinary emergency application of the brakes.

The operation of my improved device is as follows: When it is desired to make the usual emergency application of the brakes the engineer's brake valve is turned to emergency position, causing the quick action of the triple valves and the local venting of the train pipe by the action of the emergency valves on each car in the usual way. The triple piston 1 has then moved back to the normal emergency position, as shown in dotted lines, compressing the graduating spring 13 and bringing the shoulder 18 against the cap 15 of the emergency spring 14 which is

made strong enough to hold the piston in this position in ordinary reductions of train pipe pressure caused by the usual manipulation of the engineer's brake valve for producing emergency applications. Owing to the local venting of the train pipe in advance of the equalization of the auxiliary reservoir and brake cylinder pressures the train pipe pressure remains somewhat lower than the equalized auxiliary reservoir and brake cylinder pressure, so that a slow leakage then occurs from the auxiliary reservoir back to the train pipe through the equalizing groove 20 around the triple piston, thus equalizing these pressures and rendering it possible to secure a prompt release of the brakes by the usual increase of train pipe pressure. The equalizing groove is made small so that leakage back to the train pipe will be slow and gradual and not materially reduce the brake cylinder pressure until after the speed of the train is sufficiently diminished, and also so as not to interfere with the release movement of the triple valve by permitting a material leakage around the piston when the train pipe pressure is increased for releasing the brakes. When an emergency application results from a bursted hose, or other accident, causing a complete venting of the train pipe to the atmosphere, the auxiliary reservoir pressure carries the triple piston back to the extreme end of its traverse, compressing the emergency spring 14 and seating the piston tightly against the gasket 21, thereby preventing any leakage from the auxiliary reservoir around the piston to the open train pipe. By this means, when an emergency application of the brakes occurs as the result of an accident, no air can escape from the brake cylinder and the brakes are held applied.

It will now be evident from the foregoing description that I have provided a simple and efficient construction which may be readily applied to existing forms of triple valve devices, and by means of which the release of the brakes, after an emergency application, due to the usual manipulation of the engineer's brake valve, may be promptly effected by the use of merely the usual amount of air supplied from the main reservoir, while at the same time the equalizing passage is closed and the brakes held applied in case of an accident causing an excessive or complete reduction of train pipe pressure to the atmosphere.

While I have specifically described one form of construction involving my invention, it is not restricted to this particular structure but covers any quick action triple valve device having means for allowing a slow or gradual equalization of train pipe and auxiliary reservoir pressures after an emergency

application caused by the usual amount of train pipe reduction, and for preventing such equalization after an emergency application due to a complete venting of the train pipe to the atmosphere.

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

1. The combination with a quick-action triple valve having means for increasing the brake cylinder pressure above that of the train pipe in emergency applications, of means for gradually equalizing the fluid pressure upon opposite sides of the triple valve piston when the same is in normal emergency position.

2. The combination with a quick-action triple valve having means for increasing the brake cylinder pressure above that of the train pipe in emergency applications, of means for gradually equalizing the fluid pressure upon opposite sides of the triple valve piston when the same is in normal emergency position, and a device for preventing such equalization upon an excessive or complete venting of the train pipe.

3. A quick-action triple valve device having ports for supplying air from the train pipe and from the auxiliary reservoir to the brake cylinder for increasing the brake cylinder pressure above that of the train pipe in emergency applications, and a restricted passage for permitting a slow equalization of the fluid pressure upon opposite sides of the triple valve piston after an ordinary emergency application of the brakes.

4. A quick action triple valve device having a small passage for equalizing the auxiliary reservoir and train pipe pressures, said passage being opened by the movement of the triple valve piston to its normal emergency position.

5. A quick action release valve device having a small equalizing passage for establishing communication from the auxiliary reservoir to the train pipe, said passage being opened by the movement of the triple valve piston to its normal emergency position and closed by a further movement of said piston.

6. A quick action triple valve device having a small leak passage for equalizing the auxiliary reservoir and train pipe pressures, means operated by the movement of the triple piston to normal emergency position for opening said passage, and means actuated by an excessive or complete venting of train pipe pressure for closing said passage.

7. A quick-action triple valve having a restricted passage around the triple piston, said passage being open only in normal emergency position.

8. A quick action triple valve device having a small leakage groove in the wall of the

triple piston chamber at the normal emergency position of the said piston, and means for limiting the movement of the piston to this position in ordinary emergency applications.

5 9. In a quick action triple valve device, the combination with the triple piston and graduating stem of a bushing having a leakage groove located therein at the normal

emergency position of the piston, and an emergency spring for resisting further movement of said piston beyond said position.

In testimony whereof I have hereunto set my hand.

ROBERT H. BLACKALL.

Witnesses:

R. F. EMERY,
JAS. B. MACDONALD.