

No. 761,703.

PATENTED JUNE 7, 1904.

R. A. PARKE.  
QUICK ACTION TRIPLE VALVE.

APPLICATION FILED OCT. 13, 1903.

NO MODEL.

Fig. 1

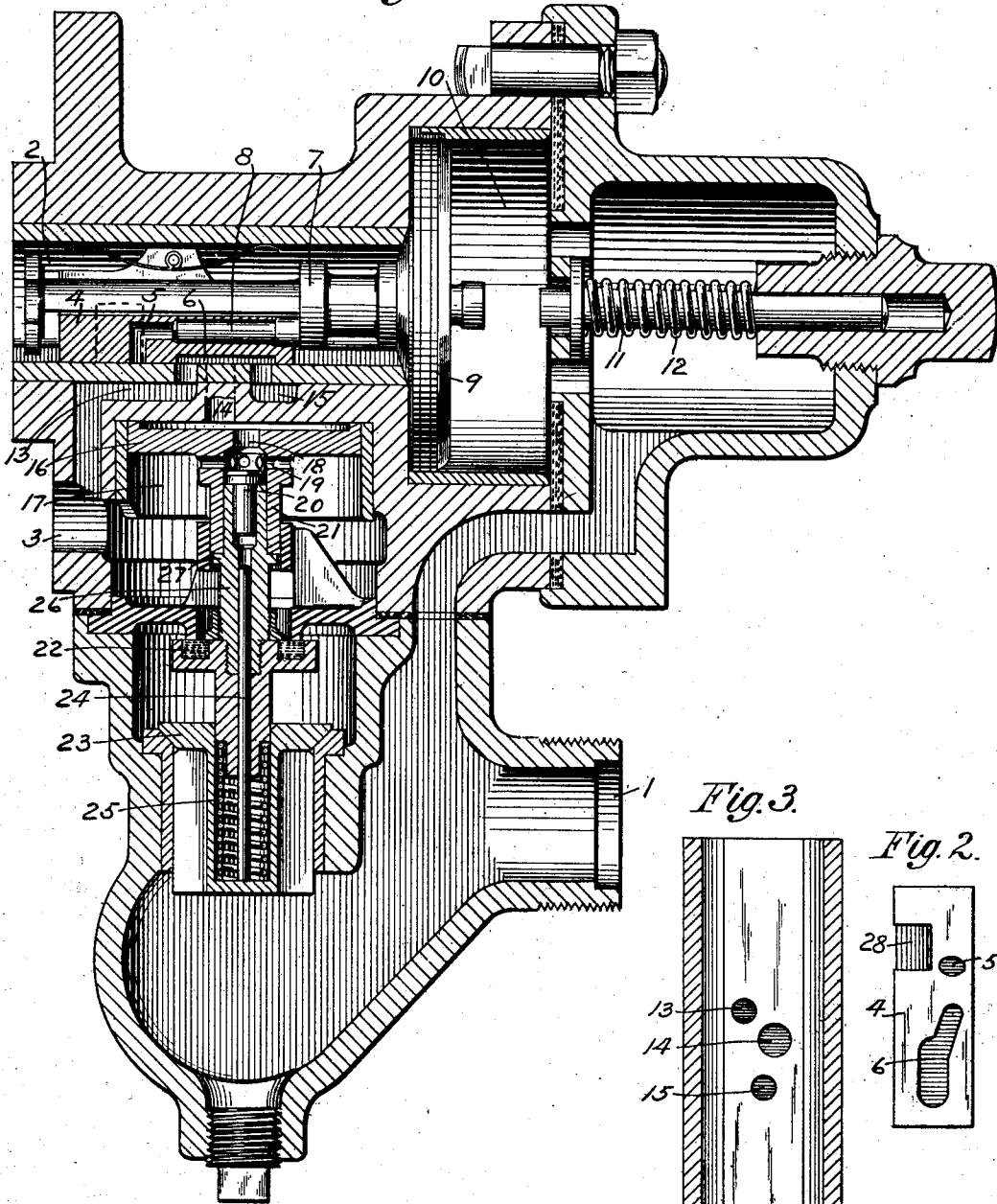


Fig. 3.

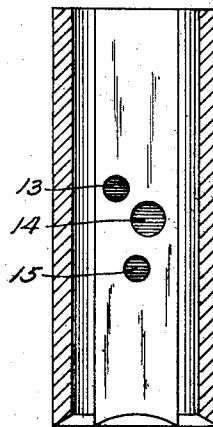
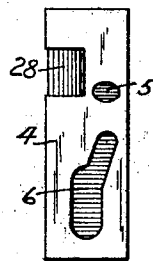


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## QUICK-ACTION TRIPLE VALVE.

SPECIFICATION forming part of Letters Patent No. 761,703, dated June 7, 1904.

Application filed October 13, 1903. Serial No. 176,866. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT A. PARKE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Quick-Action Triple Valves, of which the following is a specification.

This invention relates to triple valves for air-brake systems, and more particularly to what is known as "quick-action" triple valves in which fluid under pressure from the train-pipe is vented to the brake-cylinder in emergency applications of the brakes.

The object of the invention is to provide an improved valve mechanism by means of which in emergency applications the flow of air from the auxiliary reservoir to the brake-cylinder is at first momentarily retarded until the train-pipe pressure has equalized into the brake-cylinder and then communication is established between the auxiliary reservoir and brake-cylinder for allowing a rapid equalization of these pressures, thus securing a high degree of pressure in the brake-cylinder.

In the accompanying drawings, Figure 1 is a central vertical section showing one form of triple valve device embodying my improvement; Fig. 2, a face view of the slide-valve, and Fig. 3 a plan of the ports in the slide-valve seat.

According to the construction as shown in the drawings the valve device comprises a casing having a nozzle 1 for the train-pipe connection, a valve-chamber 2 in communication with the usual auxiliary reservoir, (not shown,) and a port 3, adapted to be connected to the brake-cylinder. (Also not shown.) In the valve-chamber is located the slide-valve 4, having graduating-port 5 and exhaust-cavity 6 and operated by a stem 7, carrying graduating-valve 8 and attached to the piston 9, operating in the cylindrical chamber 10. The graduating-stem 11, having spring 12, is held in the cap of the casing at the rear of the piston-chamber. In the slide-valve seat the port 13 leads to the brake-cylinder port 3, the port 15 to the exhaust, and the port 14 to the emer-

gency-piston chamber 17, containing piston 16 for operating the emergency-valve 22 for venting fluid under pressure from the train-pipe to the brake-cylinder. A check-valve 23, carrying a spring 25, tending to close the same, is mounted on the stem of the emergency-valve and is adapted to close to prevent backflow from the brake-cylinder to the train-pipe in emergency applications.

The emergency-piston 16 is provided with a downwardly-projecting sleeve 21, adapted to fit over the emergency-valve stem 26 and rest upon the collar 27, carried by said stem. A through-port 18 leads from the space above the piston 16 to a chamber in the sleeve above the end of the stem 26, which chamber contains an auxiliary valve 20 and communicates with the brake-cylinder space beneath the piston through one or more radial ports 19. A small hole or passage is formed longitudinally throughout the length of the emergency-valve stem 26, and this passage is enlarged at its upper end to receive the stem of the auxiliary valve 20 to guide the latter as it is moved upward to restrict or close the port 18 through the emergency-piston. Loosely fitted within the hole in the emergency-valve stem is a rod 24 of sufficient length to reach from the bottom of the spring-cavity in the check-valve to the lower end of the stem of the auxiliary valve 20 and move the same upward to its seat when the emergency-piston is pushed down to open the emergency-valve, and the check-valve is raised by the flow of air from the train-pipe to the brake-cylinder. A port 28 in the slide-valve is adapted to register with port 14 when the triple valve is moved to emergency position, at which time the brake-cylinder port 13 is closed, so that all the air which flows from the auxiliary reservoir to the brake-cylinder in emergencies must pass through the ports 14 and 18, the latter port being made slightly smaller to insure the descent of the piston when the air from the auxiliary reservoir is admitted through port 14 upon the face of the piston.

The operation of my improved device is as follows: The system being charged with air at

the standard pressure and the parts in normal release position, as shown, a reduction in train-pipe pressure made for the purpose of applying the brakes in service causes the triple piston 9 to move back and engage the graduating-stem 11, while the graduating-valve 8 is withdrawn from its seat and the port 5 registers with the brake-cylinder port 13, whereby air under pressure from the auxiliary reservoir flows to the brake-cylinder until the pressure in the auxiliary reservoir is diminished slightly below that of the train-pipe, which then causes a reverse movement of the triple piston sufficient to close the graduating-valve in the usual way. The operation of the device in service applications of the brakes is therefore the same as with the present standard apparatus, since the port 14 is closed by the slide-valve 4 when in service position. When a rapid reduction in train-pipe pressure is made for an emergency application, the triple piston makes its full traverse, compressing the spring 12 and seating against the gasket. In this position of the slide-valve the brake-cylinder port 13 is closed, while the port 28 registers with port 14, leading to the emergency-piston. As the area of port 18 is somewhat less than that of port 14 the first effect of the admission of air from the auxiliary reservoir to the face of the emergency-piston is to move the piston down, opening the emergency-valve 22, whereby the train-pipe pressure immediately raises the check-valve 23 and equalizes into the brake-cylinder through the emergency-valve and brake-cylinder port 3. At the same time it will be noted that the auxiliary valve 20 is carried upward toward its seat by means of the rod 24, so that communication from the auxiliary reservoir to the brake-cylinder through port 18 is momentarily cut off or restricted until the train-pipe and brake-cylinder pressures have equalized, when the spring 25 immediately returns the check-valve 23 to its seat, thus permitting the descent of the rod 24 and auxiliary valve 20 and the full opening of the port 18, through which air under pressure from the auxiliary reservoir then rapidly equalizes into the brake-cylinder. By this means the flow of air from the higher pressure of the auxiliary reservoir to the brake-cylinder is momentarily retarded at first, thereby allowing a greater amount of air from the lower pressure of the train-pipe to flow into the brake-cylinder before the closing of the check-valve, and to this extent securing a higher ultimate brake-cylinder pressure in emergency applications. When the triple valve is returned to release position, the air from the brake-cylinder can escape through port 13 and also through ports 18 and 14 to the exhaust-cavity 6 of the slide-valve and to exhaust-port 15.

While I have described in detail one particular form of my improved valve device, it is to be understood that my invention is not

limited thereto, but also covers various other designs of valve devices in which the flow of air under pressure from the train-pipe to the brake-cylinder in emergency applications operates to momentarily retard the flow from the auxiliary reservoir to the brake-cylinder.

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

1. A valve device for fluid-pressure brakes, comprising means operated by a rapid reduction of train-pipe pressure for opening communication from the auxiliary reservoir and the train-pipe to the brake-cylinder, and means operated by the flow from the train-pipe to the brake-cylinder for restricting or closing the communication from the auxiliary reservoir to the brake-cylinder.

2. A triple valve device for fluid-pressure brakes, comprising a movable abutment operated by variations of train-pipe pressure for opening communication from the auxiliary reservoir to the brake-cylinder when in one position, and for opening another communication from the auxiliary reservoir to the brake-cylinder when in another position, and means operated by the flow from the train-pipe to the brake-cylinder in emergency applications for momentarily closing the second communication.

3. A triple valve device having a graduating-port for establishing communication from the auxiliary reservoir to the brake-cylinder in service applications, and another emergency port or passage for connecting the auxiliary reservoir and brake-cylinder in emergency applications, a movable abutment and valve for controlling said ports, a valve mechanism operating in emergency applications to open communication from the train-pipe to the brake-cylinder, and means operated by the flow from the train-pipe to the brake-cylinder for momentarily closing the emergency-passage from the auxiliary reservoir to the brake-cylinder.

4. A triple valve device comprising a movable abutment and valve operated by variations of train-pipe pressure for controlling communication from the auxiliary reservoir to the brake-cylinder in service and in emergency applications, an emergency-valve for venting train-pipe fluid to the brake-cylinder in emergency applications, a separate piston for operating said emergency-valve, and means actuated by the flow from the train-pipe to the brake-cylinder for momentarily restricting or closing communication from the auxiliary reservoir to the brake-cylinder.

5. A triple valve device comprising an emergency piston and valve for venting train-pipe fluid to the brake-cylinder, a port or passage for establishing communication from the auxiliary reservoir to the emergency-piston chamber and the brake-cylinder, a valve and movable abutment operated by a sudden or rapid

reduction of train-pipe pressure for opening said port, and means actuated by the flow from the train-pipe to the brake-cylinder for momentarily closing or restricting the communication from the auxiliary reservoir to the brake-cylinder.

5 6. A triple valve device comprising an emergency valve and piston operated by auxiliary-reservoir pressure for venting train-pipe fluid to the brake-cylinder in emergency applica-  
10 tions, a port through said piston for supplying fluid from the auxiliary reservoir to the brake-cylinder, and means operated by the flow from the train-pipe to the brake-cylinder  
15 for momentarily restricting or closing said port.

7. A triple valve device comprising an emergency-valve for venting train-pipe fluid to the brake-cylinder, an emergency-piston operated  
20 by auxiliary-reservoir pressure for opening

said valve and having a through-port, an auxiliary valve for said port, and means actuated by the flow from the train-pipe to the brake-cylinder for controlling said auxiliary valve.

8. A triple valve device comprising an emergency-valve for venting train-pipe fluid to the brake-cylinder, an emergency-piston operated by auxiliary-reservoir pressure for opening said valve and having a through-port, an auxiliary valve for said port, a check-valve in the  
25 passage leading from the train-pipe to the brake-cylinder, and a rod actuated by the movement of the check-valve for operating the auxiliary valve.  
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In testimony whereof I have hereunto set  
35 my hand.

ROBERT A. PARKE.

Witnesses:

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C. G. HANSON.