No. 858,645. PATENTED JULY 2, 1907.

G. H. BOSWELL.

AIR BRAKE MECHANISM.

APPLICATION FILED MAY 23, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

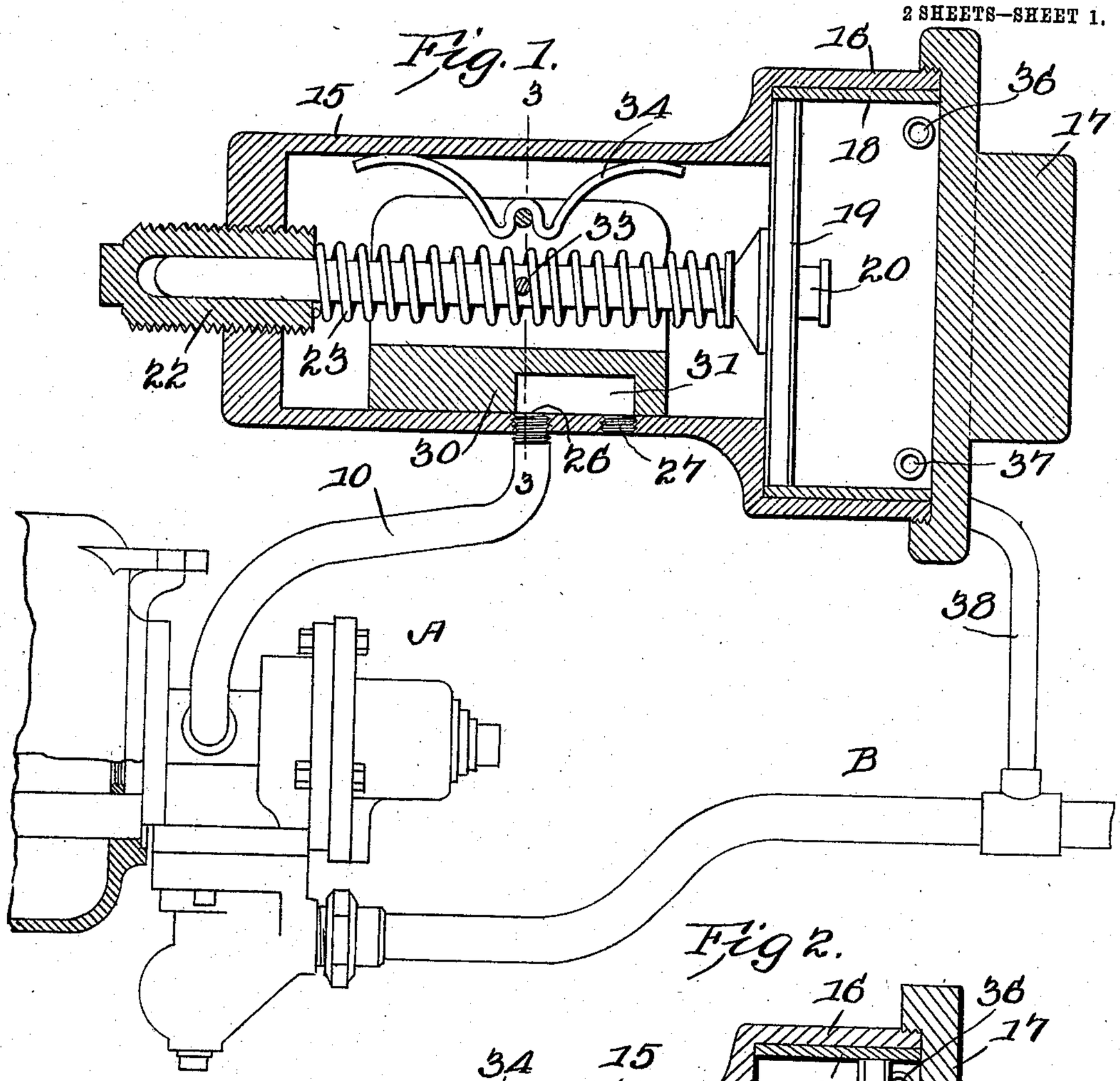
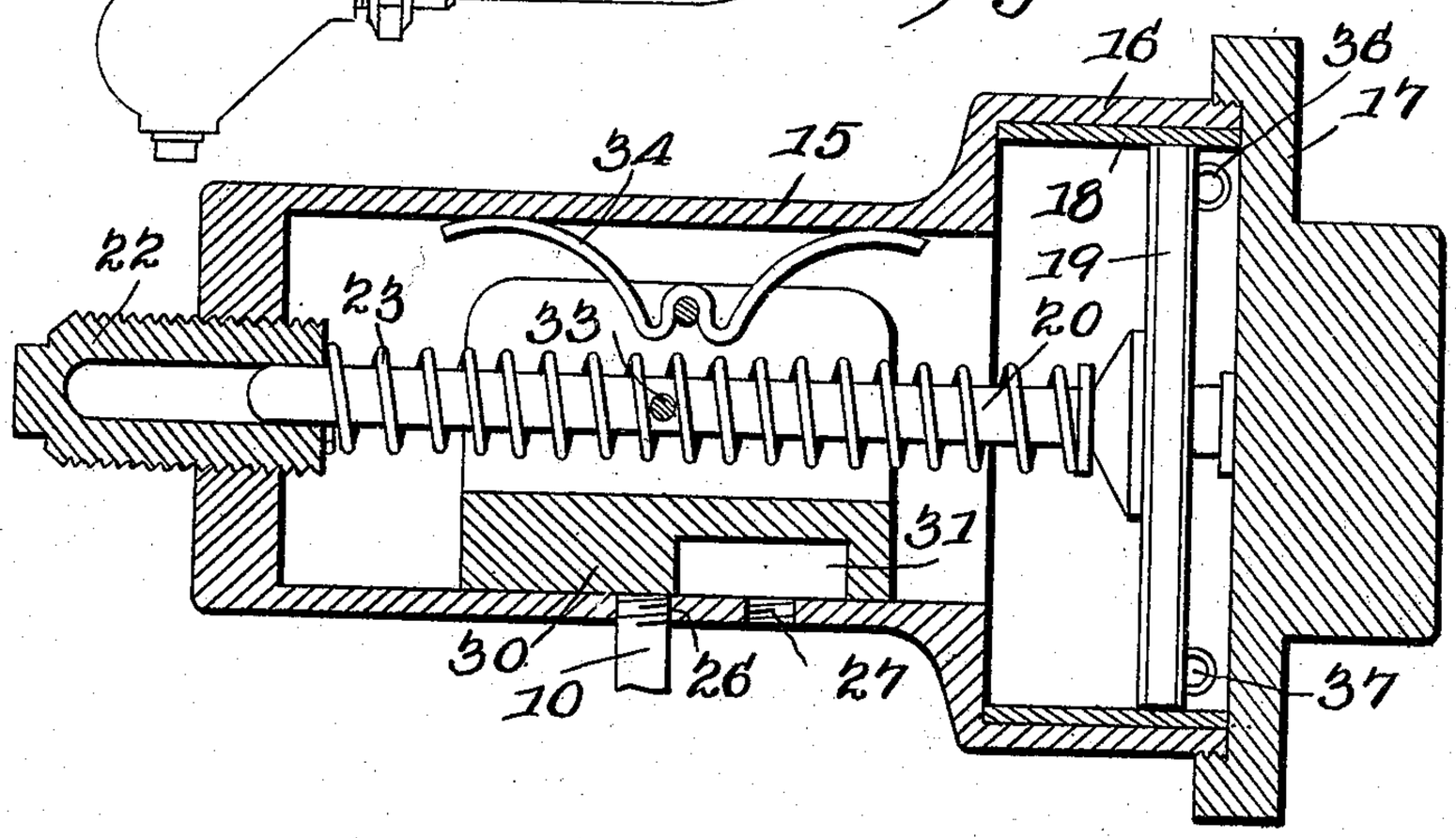


Fig 2.



WITNESSES:

E. F. Stewart

Jno. E. Parker

George H. Boswell, INVENTOR.

By Crosby & Co

ATTORNEYS

No. 858,645. PATENTED JULY 2, 1907.

G. H. BOSWELL.

AIR BRAKE MECHANISM.

APPLICATION FILED MAY 23, 1906.

2 SHEETS—SHEET 2.

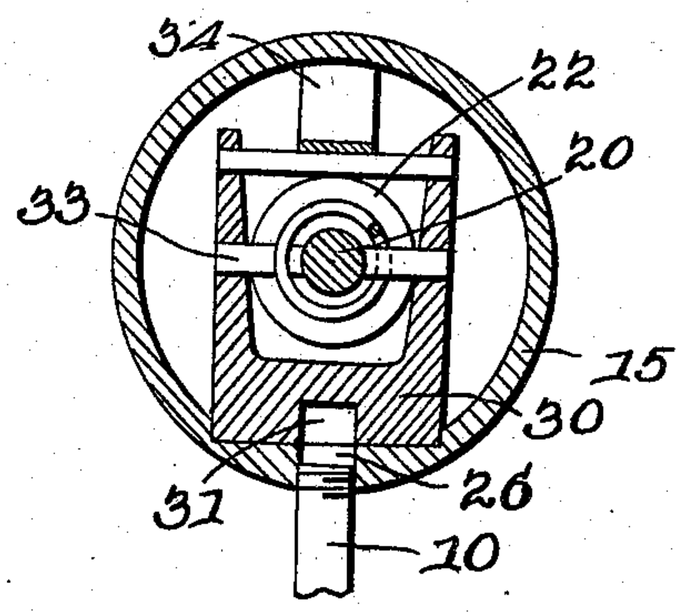


Fig. 3.

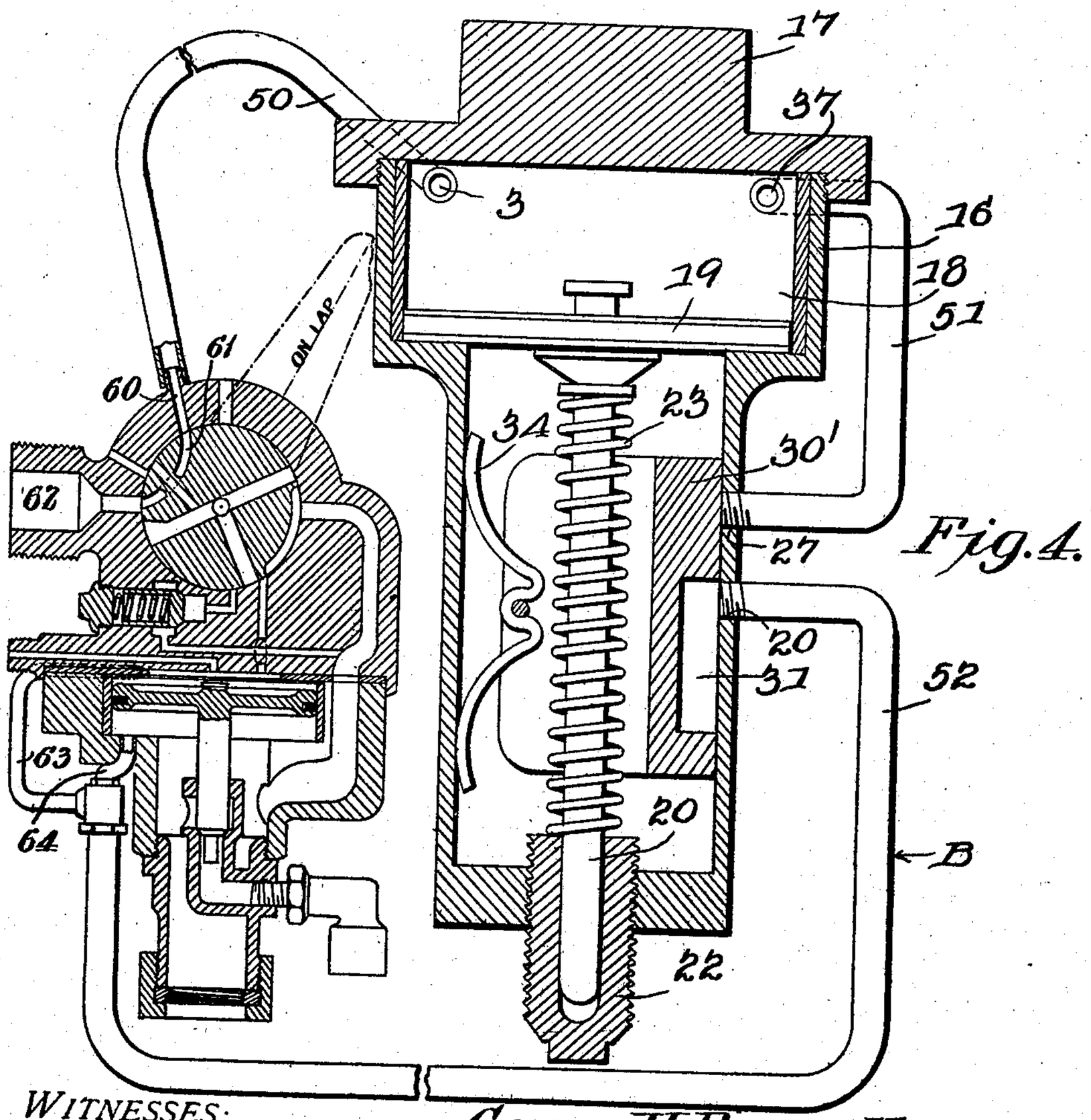


Fig. 4.

WITNESSES:

E. F. Eberhardt

Jno. E. Parker

George H. Boswell, INVENTOR.

By Church & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE HAMILTON BOSWELL, OF ALBANY, GEORGIA.

AIR-BRAKE MECHANISM.

No. 858,645. Specification of Letters Patent. Patented July 2, 1907.

Application filed May 23, 1906. Serial No. 318,363.

To all whom it may concern:

Be it known that I, GEORGE HAMILTON BOSWELL, a citizen of the United States, residing at Albany, in the county of Dougherty and State of Georgia, have invented a new and useful Air-Brake Mechanism, of which the following is a specification.

This invention relates to air brake systems, and has for its principal object to provide means whereby the braking pressure may be retained in the brake cylinder during the recharging of the auxiliary reservoir, and further to so arrange the mechanism that when the engineer's brake valve is placed on lap as is usual after either an emergency or service reduction, communication will be opened up between the main reservoir and the train pipe in order to gradually recharge the train pipe and the auxiliary reservoirs without waiting for the engineer to move his valve to running or release position.

A still further object of the invention is to provide a brake apparatus by which on a second reduction following closely a first application of the brakes, it will be possible to obtain a braking pressure equal to or greater than the present emergency braking pressure.

A still further object of the invention is to so arrange and construct the mechanism that it may be employed to advantage in connection with existing Westinghouse or New York air brake mechanism with a slight change in the engineer's brake valve, the triple valves remaining unaltered.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size or minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings:—Figure 1 is a sectional elevation of the retaining valve employed in connection with the triple valve for holding the pressure in the braking cylinder during the recharging of the auxiliary reservoir, the valve being shown in release position. Fig. 2 is a similar view showing the valve in pressure retaining position. Fig. 3 is a transverse sectional view of the valve on the line 3—3 of Fig. 1. Fig. 4 is a sectional elevation of the mechanism employed in connection with the engineer's brake valve, the latter being shown in diagram.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In Fig. 1 is illustrated a triple valve A of the Westinghouse type connected in the usual manner to the train pipe B. From the exhaust port of the triple valve leads a pipe 10, said pipe being connected to the pressure retaining valve forming the subject of the present invention, so that the exhaust from the brake cylinder may pass to this valve, instead of to the outer air, as usual. The pressure retaining valve has a suitable casing 15, which is enlarged at one end to form a cylinder 16, the latter being closed by a suitable cap 17. In the cylinder is a bushing 18 within which is arranged an air tight piston 19, that is carried by a stem 20, the head of the stem being designed to engage with the cap when the piston is moved to the position illustrated in Fig. 2. The rear end of the spring extends through the casing 15, and enters a guiding recess formed in a nut 22, that is screwed in the threaded opening at the rear end of the casing. On this stem is mounted a helical compression spring 23 that tends to move the piston from the position shown in Fig. 1 to the position shown in Fig. 2, and the stress of the spring is adjusted slightly above the ordinary auxiliary reservoir pressure, that is to say, if a working pressure of sixty-five pounds is used, the spring will be adjusted to exercise a force of approximately sixty-eight pounds, and thus will tend normally to keep the parts in the position shown in Fig. 2.

In the wall of the casing are two ports 26 and 27, and in the construction shown in Figs. 1 and 2 the port 26 is connected to the pipe 10, while the port 27 opens to the outer air. These ports are formed in a valve seat that is arranged for the reception of a slide valve 30 having a suitable cavity 31 by which the ports may be placed in communication with each other when the valve assumes the position shown in Fig. 1; normally, however, the valve is in the position shown in Fig. 2, and the port 26 is blanked. The valve is connected to the stem 20 by a suitable cross pin 33 that is held down to its seat by a spring 34 of the type usually employed for the main valves of triple valves.

In the wall of the cylinder 16 are two ports 36 and 37, of which the port 37 alone is utilized when the device is employed in connection with the triple valve, the port 36 being plugged. This port 37 is connected by a branch pipe 38 to the train pipe B, and the piston is, therefore, always exposed to train pipe pressure.

In operation, the brakes being released, and the train pipe pressure entered through the port 37, the parts remain in the position shown in Fig. 2 when the train pipe pressure is normal, in the present instance sixty-five pounds. The brakes may be applied by either service or emergency reduction in the usual manner, and if it is desired to immediately release them, excess pressure is sent through the train pipe, that it to say, a pressure of approximately seventy-pounds, and this pressure will act on the triple valve in the usual manner to move the valve to release position, and will, also, overcome the stress of the spring 22, and will move the piston 19 to the position shown in Fig. 1, so that the air issuing from the escape port to the triple valve may pass through the pipe 10 to port 26, and thence through the cavity 31 of

the valve 30 and out through the port 27. Should the engineer desire to recharge the auxiliary reservoir without releasing the brake, he may place his valve in lap position and the air will gradually pass to the train pipe, the pressure will be gradually brought up to sixty-five pounds, moving the triple valve to release position, so that the air may pass through the usual feed groove of the main piston, to the auxiliary reservoir, and replenish the supply. This pressure of sixty-five pounds, however, is not sufficient to move the piston 19 against the stress of the spring 23, and the valve 30 will remain in the position shown in Fig. 2, so that while the triple valve is in release position, the air cannot reduce in the brake cylinder, and the brakes will remain applied until excess pressure is sent through the train pipe for the purpose of moving the piston 19.

In order to permit the recharging of the auxiliary reservoirs while the engineer's brake valve is at lap and the brakes are set, the retaining valve and its casing are arranged as shown in Fig. 4. In this case the valve 30′ is reversed, so that the spring tends to move the valve in such manner that the cavity 31 will be placed in communication with the pipes 50 and 52, and the spring in this case is set at a tension of sixty-five pounds. The inlet port 36 is placed in communication with a port 60 leading from the casing of the engineer's brake valve by means of a pipe 50, and in the valve proper is a curved port 61 which, when the engineer's brake valve is in lap position will be in communication with the main reservoir connection 62 of the engineer's valve This permits the air under main reservoir pressure to pass gradually through the pipe 50 to port 36, cylinder 18, thence through port 37, pipe 51, valve cavity 31, pipe 52, to two pipes 63 and 64, one of which leads to a point above the equalizing piston of the engineer's brake valve, and the other to a point below the equalizing piston of the brake valve. When the engineer moves his valve to lap position as he usually does after making either an emergency or a service reduction, the small port 61 will place the pipe 50 in communication with the main reservoir connection, and air will slowly feed from the main reservoir to the train pipe, passing partly above and partly below the equalizing piston in order not to disturb the position of the latter, and the pressure will be gradually brought up to sixty-five pounds in the train pipe, and in the retaining valve, and in the triple valve. The triple valve will therefore move, as above described, to release position, and the retaining valve, being set at sixty-eight pounds, will not move to release position, so that the pressure will be held in the brake cylinder, while the auxiliary reservoir is being recharged. When the auxiliary reservoir has received its full charge of sixty-five pounds and the train pipe pressure is also sixty-five pounds, the slightest increase above this will cause the piston 19 to descend against the action of the spring 22, and the port 31 of valve 30′ is allowed to move out of alinement with the pipe 51, thereby cutting off the further flow of air from the main reservoir to the train pipe, so that the recharging operation will be perfectly automatic.

It is obvious that the device may be utilized in connection with both the triple valve and the engineer's brake valve, the structure remaining the same in both cases, with the exception that the position of the valve is reversed, and one of the cylinder ports is at one time plugged, and at another time utilized for the passage of air.

I claim:—

1. A pressure controlling valve mechanism for use in connection with triple valves or engineer's brake valves, consisting of a casing having a valve seat provided with two ports that are disposed in alinement with each other in the direction of the length of the casing, the casing having at one end a cylinder through the walls of which extend two ports, one of which may be plugged when the device is used in connection with a triple valve, a piston fitting within the cylinder, a slide valve controlling the two ports of the casing, a piston rod having a rigid connection with the slide valve, a spring surrounding the piston rod and bearing at one end against the piston, a recessed nut carried by the casing and against which the opposite end of the spring bears, the recess of the nut forming a guide for the end of the piston rod, and a spring arranged between the casing and the valve and tending to hold the latter to its seat.

2. In air brake mechanism, an engineer's brake valve having an auxiliary port movable into communication with the main reservoir connection when the valve is on lap, a valve casing, a valve therein, a cylinder in communication with the casing, a piston in said cylinder and connected to the valve, a pipe leading between the engineer's brake valve and the cylinder, a second pipe leading from the cylinder to a port under the control of said valve, a second pipe also under the control of the valve, and connections between said second pipe and the upper and lower portions of the cylinder of the equalizing piston.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

GEORGE HAMILTON BOSWELL.

Witnesses:
J. P. CHAMPION,
PAUL H. JONES.