F. H. WOODS.

RETAINING VALVE.

APPLICATION FILED JULY 24, 1909.

960,133.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

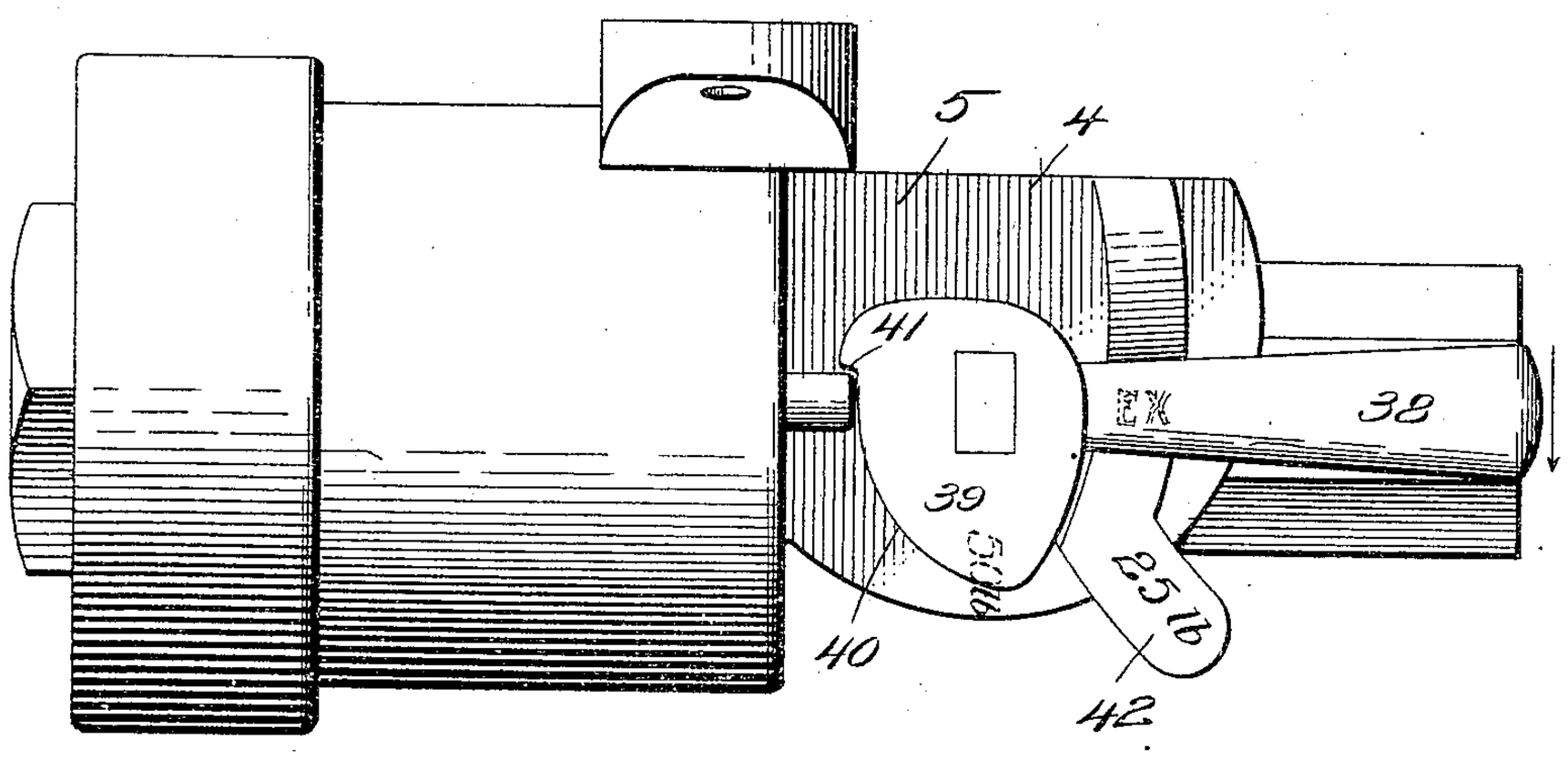
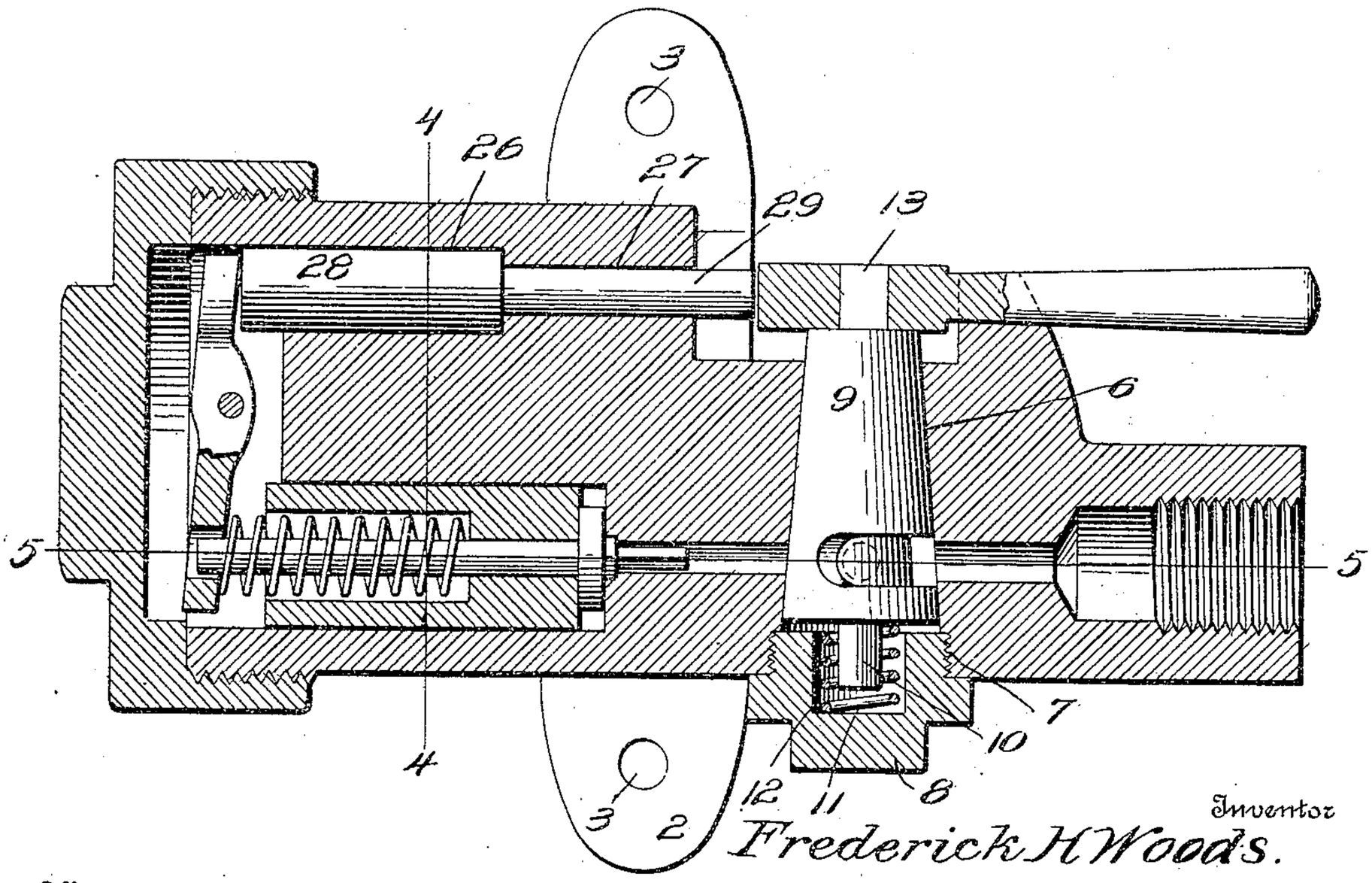


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

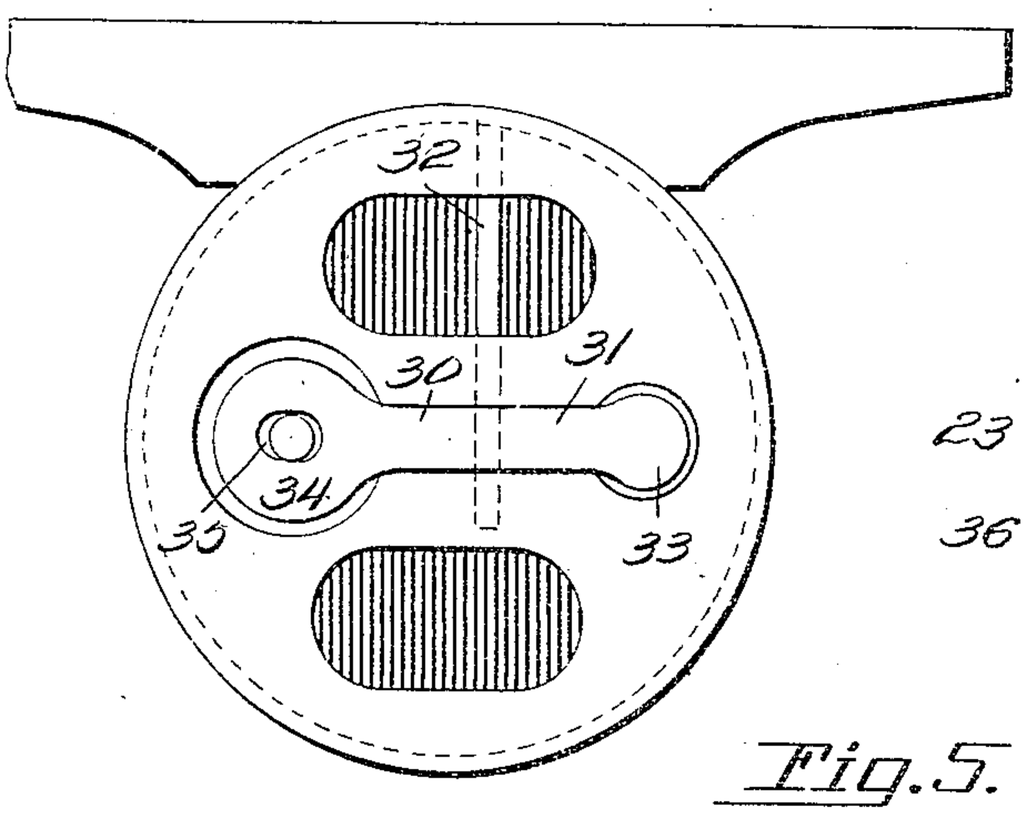


Fig. 4.

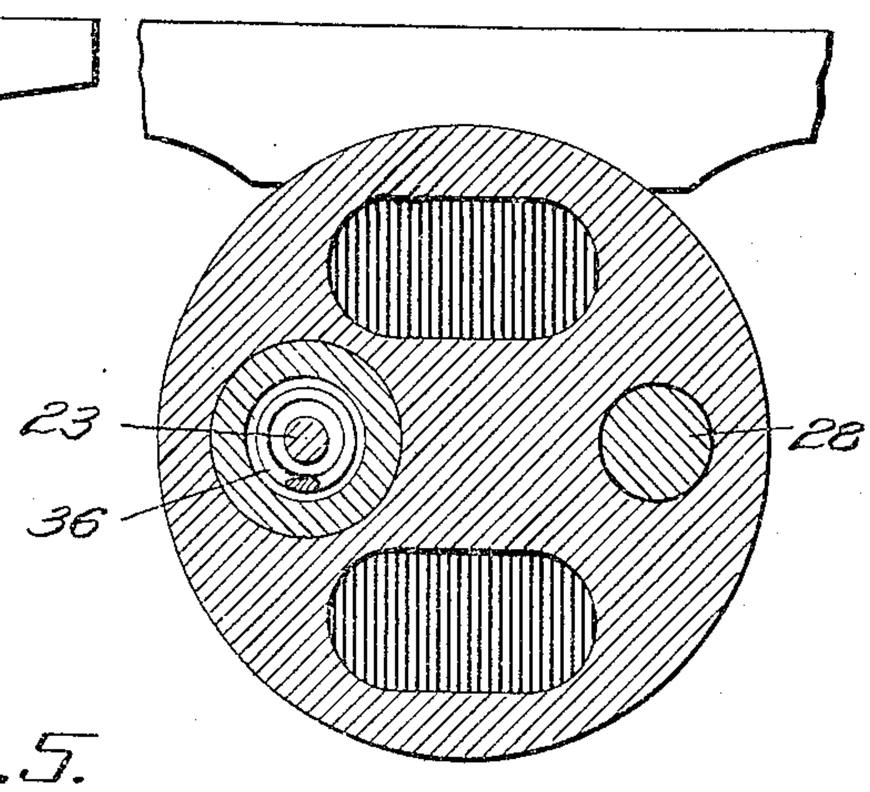


Fig. 5.

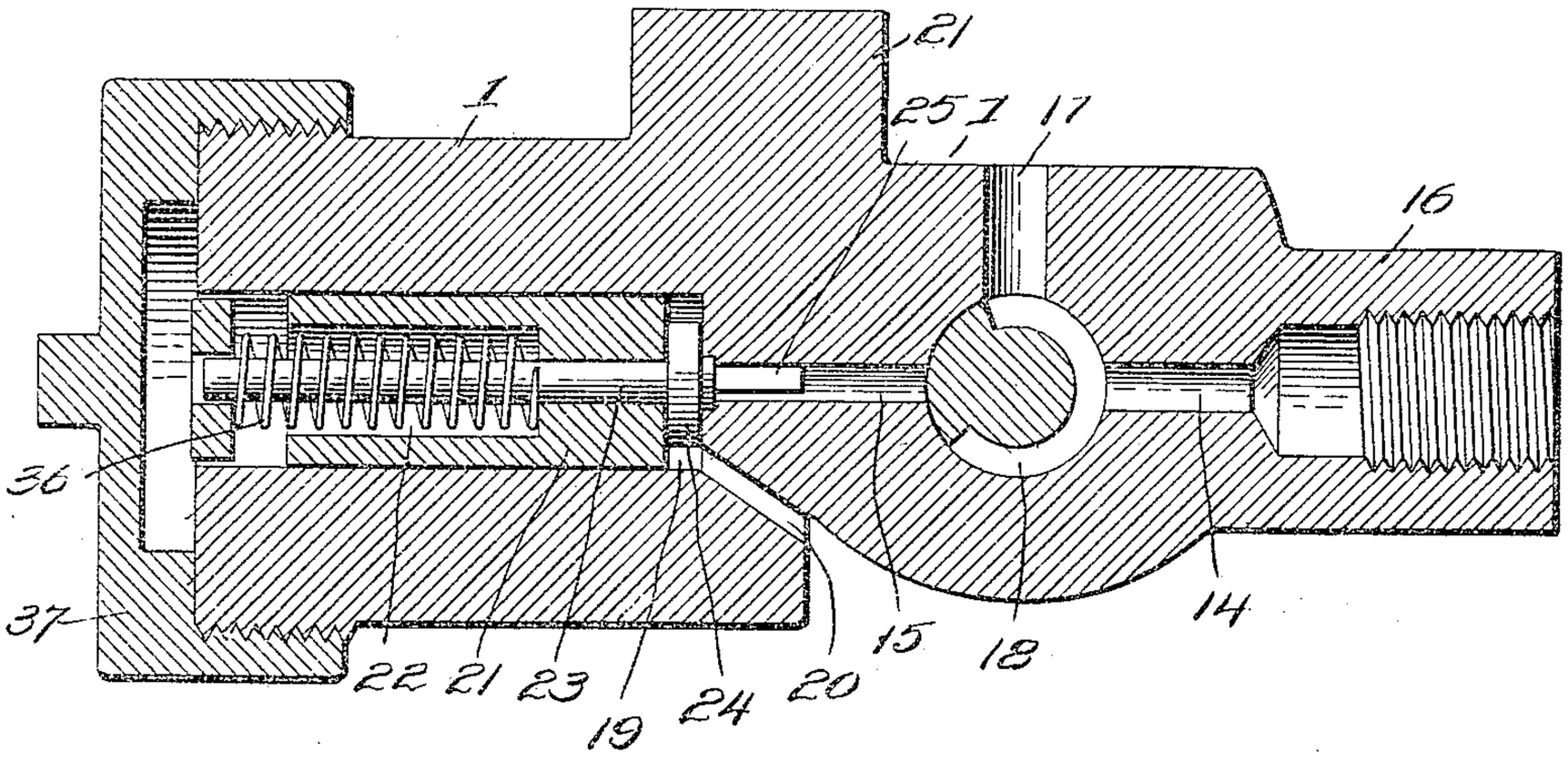


Fig. 6.

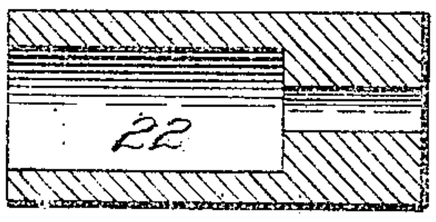
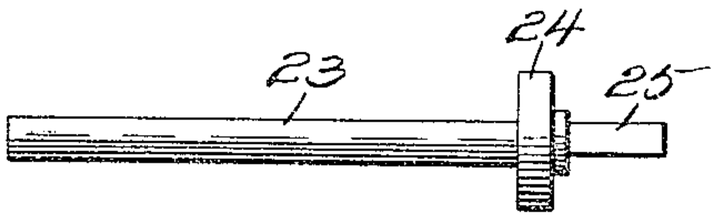


Fig. 8.

Fig. 7.



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UNITED STATES PATENT OFFICE.

FREDERICK H. WOODS, OF OLEAN, NEW YORK.

RETAINING-VALVE.

960,133. Specification of Letters Patent. Patented May 31, 1910.

Application filed July 24, 1909. Serial No. 509,279.

To all whom it may concern:

Be it known that I, FREDERICK H. WOODS, a citizen of the United States, residing at Olean, in the county of Cattaraugus and State of New York, have invented new and useful Improvements in Retaining-Valves, of which the following is a specification.

The invention relates to an improvement in retaining valves designed for use in connection with air brake systems and adapted to permit manual control of the pressure in the brake cylinder so as to retain in said cylinder a desired pressure to maintain the brake set while the train line is being recharged.

The main object of the present invention is the provision of a retaining valve designed to be connected to the triple valve exhaust, said retaining valve including pressure controlling means which is manually adjustable to vary the extent of pressure required to operate said means, whereby the brake cylinder release can be set at a desired pressure, thereby retaining such pressure in the brake cylinder without regard to the condition of the train pipe.

The invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a plan of the improved retaining valve. Fig. 2 is a vertical section partly in elevation of the same. Fig. 3 is an end elevation with the cap removed. Fig. 4 is a section on line 4—4 of Fig. 2. Fig. 5 is a horizontal section on line 5—5 of Fig. 2. Fig. 6 is a longitudinal section of the pressure sleeve. Fig. 7 is an elevation of the valve and the rod therefor. Fig. 8 is an end view of the same.

Referring particularly to the accompanying drawings, my improved retaining valve comprises a body 1, preferably of approximately cylindrical form and provided near one end with laterally projecting ears 2 formed with bolt holes 3, whereby the valve may be secured in place. At one end the body is formed to provide an offset 4 having its lower surface and one side coincident with the corresponding plane of the body proper and its upper surface 5 below the upper surface of the body proper, the top or upper side 5 of the extension being plain, as shown. Extending vertically through the extension 5 and about centrally thereof is a valve opening 6 preferably of gradually increasing diameter in the upward direction to form an opening of conical section, the walls of the opening at the lower portion being threaded at 7 to receive a cap 8. Within the opening 7 is mounted a conical valve 9 formed at its lower end with a reduced central extension 10 adapted to seat in a depression 11 in the cap 8, a spring 12 surrounding the extension within the depression and operating to normally hold the valve 9 in properly seated relation within the opening 6 to maintain an airtight connection. The upper end of the valve 9 extends above the upper surface 5 of the body projection and is formed with a squared head 13, for a purpose which will presently appear. The valve body and projection 4 are formed with a longitudinally extended port, which is in communication with the valve opening 6, dividing said port into two sections 14 and 15, communication between which is controlled by the valve. The section 14 of the duct is in communication with an interiorly threaded nipple 16 forming a part of the body projection 4 and designed to receive a pipe connected to the triple valve exhaust. A lateral escape port 17 also communicates with the valve opening 6, said port 17 being open to the atmosphere. The valve 9 in alinement with the ports 14, 15 and 16 is formed with a circumferentially disposed channel 18 extending part way around the valve, and so arranged that the valve may be operated to establish communication between sections 14 and 17 of the air ports or between the sections 14 and 15 thereof, as will be obvious from Fig. 5 of the drawings.

The main section of the body in alinement with the port 15 is formed with a longitudinally extending opening 19 having a diameter materially greater than that of the port section 15. The chamber 19 thus provided is in communication with the atmosphere through an opening 20 formed in the body at one side of the port 15. A pressure sleeve 21 is arranged for sliding movement in the chamber 19, the relatively forward end, or that end remote from the port section 15 being formed with a cylindrical depression 22 so that for the greater portion of its length the sleeve 21 is of hollow formation. A valve rod 23 is slidably mounted in an opening in the otherwise solid portion of the sleeve, said rod extending beyond said solid end and being pro-

vided with a check valve 24 of a size and shape to effectively close the proximate end of the port section 15, thereby cutting off communication between said section and the escape port 20. The valve rod is preferably formed with a guide section 25 extending within the port section 15 and guiding the rod in movement, said guide member being preferably triangular in cross section, as shown in Fig. 8, to permit the proper guiding operation without closing the port section. The valve rod extends through the hollow portion of the sleeve and beyond the end of the sleeve, terminating approximately in line with the forward end of the valve body when the parts are in normal position. The body 1 is formed with a longitudinally extending opening 26 arranged above and in parallel relation to the chamber 19, said opening extending wholly through the cylindrical portion of the body but having that end adjacent the body projection 4 reduced in diameter, as at 27. A pressure rod 28 is mounted for sliding movement in the opening 26, the reduced end 29 of said rod extending rearwardly beyond the wall of the cylindrical portion of the body overlying the surface 5 of the body projection. The opening 26 and chamber 19 are in communication by a channel 30 formed in the end of the valve body, and a pressure lever 31 is pivotally mounted in this channel, preferably through the medium of a pivot pin 32 passed through the body and lever, as shown. The pressure lever is formed at one terminal with a disk head 33 designed to overlie and at all times engage the forward end of the pressure rod 28, the opposite end of the lever is also formed with a disk head 34, having a central opening 35 of elongated form through which opening the forward end of the valve rod 23 is designed to loosely pass. The inner surface of the head 34 of the lever operates therefore as an abutment for one end of a spring 36 seated in the hollow portion of the sleeve 21, and encircling the valve rod therein, the opposite end of said spring bearing against the bottom wall of the depression 22, all as clearly shown in Fig. 5. A cap 37 is threaded upon the cylindrical body at the forward end, making an airtight connection and concealing the parts just described.

Secured upon the squared head 13 of the operating valve 9 is a lever 38, having a cam head 39, which latter is formed with an opening to snugly receive the head 13 and insure turning of the valve in the operation of the lever. The cam head 39 is formed with a cam edge 40, which is designed to at all times engage the projecting end of the portion 29 of the pressure rod, the cam edge 40 terminating in an abrupt shoulder 41 forming a limit for the closing movement of the lever and in which position it is to be understood that there is the least pressure on the rod 28. As the lever handle is moved in the direction of the arrow, Fig. 1, the cam edge 40 of the head 39 acts with an increasing pressure on the rod 28, thus forcing said rod in the forward direction to a gradually increasing extent, for a purpose which will presently appear. If desired the surface 5 may be formed with indicating extensions 41—42 whereby the position of the lever for a pressure indicated on such extension may be accurately determined.

With the parts constructed and arranged as described the operation of the improved retaining valve is as follows: It is to be understood, of course, that when the lever 38 is in the position shown in Fig. 1, which is the normal position, the channel 18 in the operating valve establishes free communication between the port section 15 and the escape port 17 so that the triple valve controls the brake pressure in the usual manner. It is to be further understood that the improved retaining valve is preferably mounted upon the car structure adjacent the brake mechanism, so that the brakeman may at all times control the improved valve as may be necessary in the particular instance. Under certain conditions it is desirable that the brake pressure to a certain extent at least be maintained in the cylinders while the train line is being recharged, and assuming that the brakeman desires to retain twenty-five pounds of pressure in the brake cylinder independent of the operation of the triple valve he will move the lever 38 until the handle thereof is in line with the indicator marked for twenty-five pounds. This movement of the lever will through the cam edge 40 previously described exert a pressure upon and compel a forward movement of the pressure rod 28. The forward end of the rod operates to force outward the contact end of the pressure lever and thereby force inward the opposing end. The inward movement of the latter end increases the pressure upon the spring 36 and thereby requires a greater pressure to displace the check valve 24. As the movement of the operating valve has arranged the channel 18 so as to cut off the escape port 17 and establish communication between the port sections 14 and 15 the only escape for the brake cylinder pressure is through the port 20, and the tension of the valve retaining spring has been so increased as to require more than twenty-five pounds pressure to move said valve. Hence a twenty-five pound pressure will be retained in the brake cylinder irrespective of the condition of the triple valve. If additional pressure is required, as fifty pounds, the handle is moved to cause the pressure upon the spring 36 to be increased, hence requiring a greater or

fifty pound pressure to move the check valve 24.

From the construction described it will be obvious that I provide a simple form of retaining valve which may be readily operated by the brakeman to retain any desired pressure in the brake cylinder wholly independent of the triple valve, the normal or neutral position of the lever giving the triple valve control in the usual manner.

I claim:

1. A pressure retaining valve formed with an escape port, a check valve controlling the same, a spring arranged to exert pressure upon said check valve, an operating valve controlling the triple valve exhaust and means for adjusting the operating valve and simultaneously varying the tension of the spring to adjust the pressure upon the check valve.

2. A pressure retaining valve formed with an escape port, a check valve controlling said port, a rod projecting from the valve, a sleeve loosely encircling the rod, a spring encircling the rod and bearing at one end against the sleeve, and manually adjustable means for the opposing end of the spring whereby to vary the pressure of the spring on the valve.

3. A pressure retaining valve formed with an escape port, a check valve controlling said port, a rod projecting from the valve, a sleeve loosely encircling the rod, a spring encircling the rod and bearing at one end against the sleeve, a pressure lever mounted for pivotal movement having one end loosely encircling the valve rod and bearing on the spring, and means for manually adjusting the position of the opposing end of the lever.

4. A pressure retaining valve formed with an escape port, a check valve controlling said port, a rod projecting from the valve, a sleeve loosely encircling the rod, a spring encircling the rod and bearing at one end against the sleeve, a pressure lever mounted for pivotal movement having one end loosely encircling the valve rod and bearing on the spring, a pressure rod bearing on the opposing end of the lever, and means for causing a movement of said rod to increase the tension of the spring at will.

5. A pressure retaining valve formed with an escape port, a check valve controlling said port, a rod projecting from the valve, a sleeve loosely encircling the rod, a spring encircling the rod and bearing at one end against the sleeve, a pressure lever mounted for pivotal movement having one end loosely encircling the valve rod and bearing on the spring, a pressure rod bearing on the opposing end of the lever, and a hand lever formed with a cam edge to bear on one end of the pressure rod.

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

FREDERICK H. WOODS.

Witnesses:

F. A. MALLERY,

C. R. WOODS.