L. B. JAHN.

TRAIN LINE RECHARGING AND BRAKE RETAINING DEVICE.

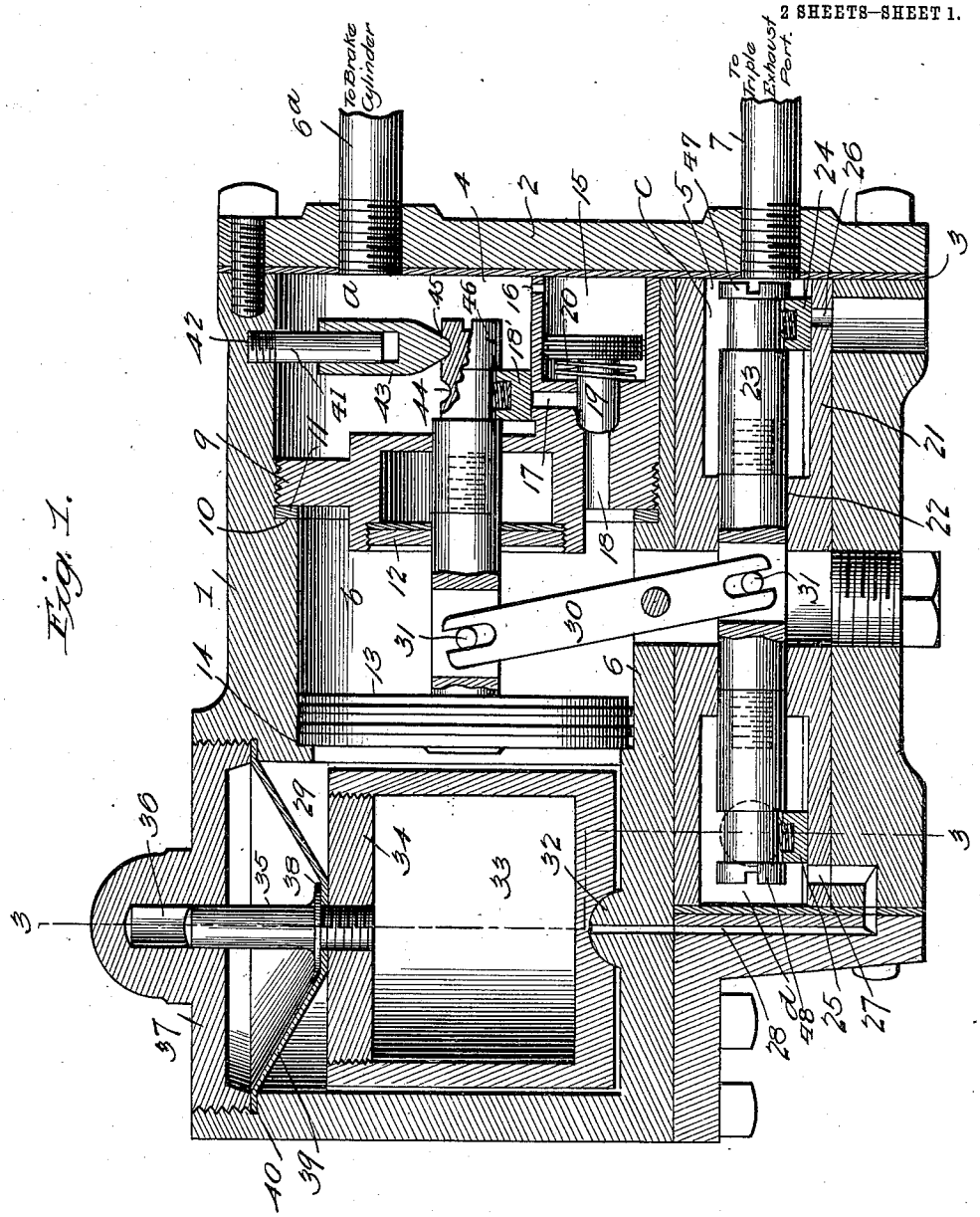
APPLICATION FILED SEPT. 24, 1908.

1,002,274.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses

D. L. Macpherson

Frank G. Burton

Inventor

Leroy B. Jahn

By William J. Thomson

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

L. B. JAHN.

TRAIN LINE RECHARGING AND BRAKE RETAINING DEVICE.

APPLICATION FILED SEPT. 24, 1908.

1,002,274.

Patented Sept. 5, 1911.

2 SHEETS—SHEET 2.

Fig. 3.

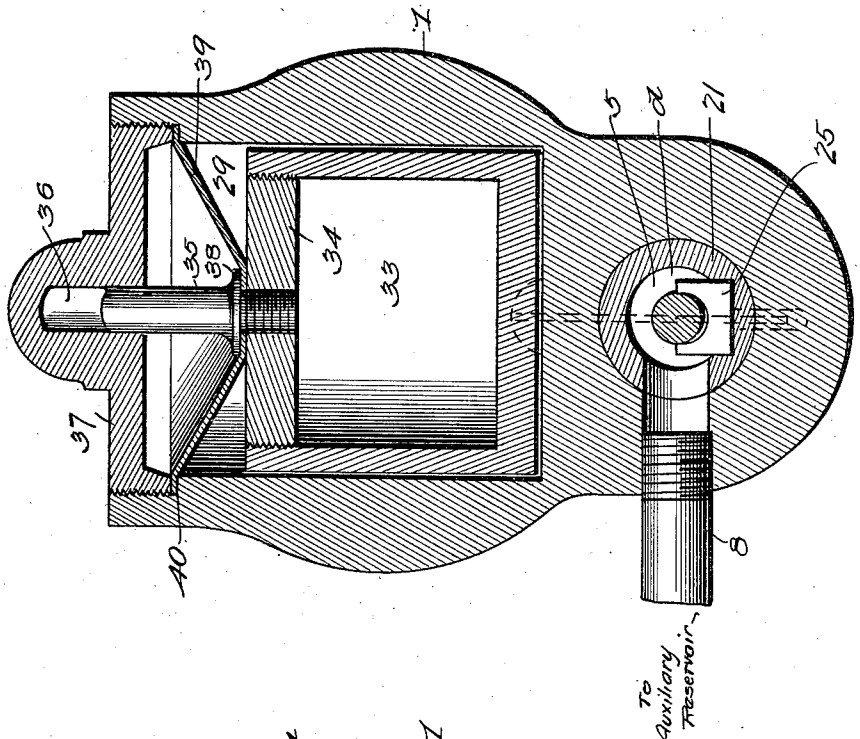
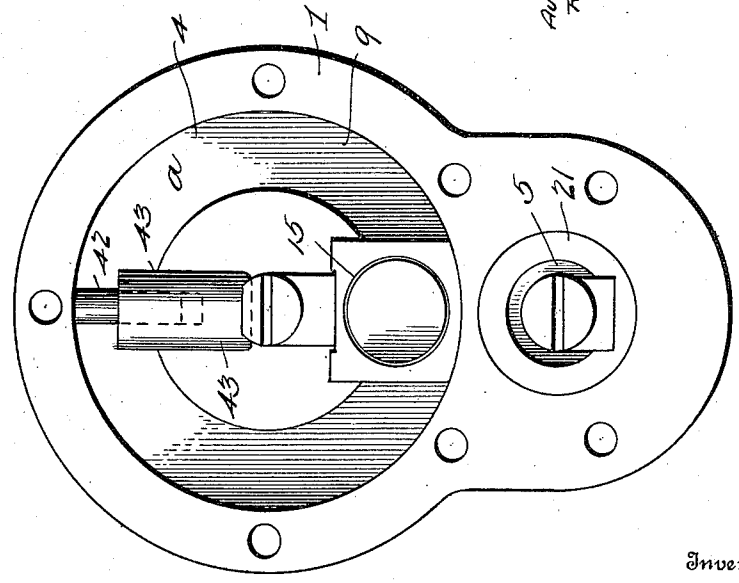


Fig. 2.



Witnesses

T. L. MacKenzie

Frank. G. Burton.

Inventor

Leroy B. Jahn.

By Williamson & Johnson,

Attorney

UNITED STATES PATENT OFFICE.

LEROY B. JAHN, OF MONTEVIDEO, MINNESOTA, ASSIGNOR TO THE JAHN AUTOMATIC TRAIN LINE RECHARGING AND BRAKE RETAINING DEVICE COMPANY, A CORPORATION.

TRAIN-LINE RECHARGING AND BRAKE-RETAINING DEVICE.

1,002,274. Specification of Letters Patent. Patented Sept. 5, 1911.

Application filed September 24, 1908. Serial No. 454,617.

To all whom it may concern:

Be it known that I, LEROY B. JAHN, a citizen of the United States, residing at Montevideo, in the county of Chippewa and State of Minnesota, have invented certain new and useful Improvements in Train-Line Recharging and Brake-Retaining Devices, of which the following is a specification.

This invention relates to air brakes in general, but has special reference to certain improvements in train line recharging and brake retaining devices. In these systems as is well known, each car is provided with an air brake cylinder and an auxiliary reservoir, both of which are connected with the train pipe running to the engine, and there is a triple valve serving to admit air from the auxiliary reservoir to the brake cylinder. This valve allows the air pressure to pass out of the brake cylinder, when the brake is released, and also admits pressure from the train pipe to the auxiliary reservoir when the valve is in the released position. But, when the brakes are applied it is impossible to increase the train line pressure without releasing the brakes, so that in order to get a service application of the brakes on a train of ten or more cars, it is necessary to reduce the train line pressure at least ten pounds, and when the brakes are released, the air is discharged from the air brake cylinder into the outer air before the pressure is restored in the auxiliary reservoir.

One of the chief objects of the invention is to provide an effective means for recharging the train line with a certain pressure, whether the brakes are in a "set" or "released" position.

Another object of the invention is to provide mechanism by means of which the entire pressure in the brake cylinder is retained during the time the train line is being recharged.

Other objects of the invention will become apparent upon a full disclosure thereof.

In the drawings illustrating the invention: Figure 1 is a central, longitudinal section of my improved device; Fig. 2 is an end elevation with the casing head or cap removed; and Fig. 3 is a transverse section on line 3—3 of Fig. 1.

In the several views, the numeral 1 indicates a suitable casing having one of its ends open and adapted to be closed by a head or cap 2. The head is firmly bolted to the end of the casing, the joint being made air tight by a suitable packing ring or gasket 3 placed between the parts. The casing is provided with chambers 4 and 5, separated by a longitudinal wall 6, the chamber 4 being divided into two compartments, *a* and *b*, the former being in communication with the brake cylinder by means of pipe 6^a. Chamber 5 is also divided into two compartments, *c* and *d*, the compartment *c* being in communication with the exhaust port of the triple valve (not shown) of an air brake system by means of pipe 7, and the compartment *d* in communication with the auxiliary reservoir (not shown) of said system by means of pipe 8. For convenience in referring to the several compartments in the claims, compartment *a* will be designated as the "brake cylinder" chamber; compartment *c* as the "exhaust" chamber, and *d* as the "auxiliary reservoir" chamber, as the several pipes 6^a, 7 and 8, connect these several chambers with the brake cylinder chamber, exhaust port of the triple valve, and the auxiliary reservoir, respectively of an air brake system.

The casing is counterbored to receive a screw threaded stuffing box 9 screwed up against an annular shoulder 10, a suitable packing ring or gasket 11 being inserted between said shoulder and the stuffing box to make an air tight joint, the stuffing box dividing the chamber into compartments *a* and *b*. The open end of the stuffing box is fitted with a screw threaded head 12, through which, and the outer wall of said stuffing box, passes the stem of a piston 13, the head of which is adapted to seat against an annular seat 14. The stuffing box is provided with a chamber 15 which is in communication with the chamber *a* by a small port 16 always open. The chamber *a* is in communication with chamber *b* by intersecting ports 17 and 18, the port 17 being closable by a valve 18′ operated by the stem of the piston 13, and both ports closable by a stem or plug valve 19, arranged in the chamber 15, as an additional precaution to prevent leakage of air, under valve 18′, from chamber *a* through ports 17 and 18 to chamber *b*. The valve 19 is held normally open by a spring 20 and is closed by the pressure of air in the chamber 15, the air having entered said chamber through the port 16.

Fitted in the chamber 5 is a barrel 21 divided by a vertical wall 22, said wall being bored for the reception of a reciprocatory rod 23, and dividing said chamber into compartments *c* and *d*. The rod 23 is adapted to operate valves 24 and 25, the valve 24 being adapted to close a port 26, which opens into the outer air, and the valve 25 is adapted to close a port 27 which is in communication with an air channel 28, leading into a chamber 29 communicating with the chamber *b*. The rod 23 is reciprocated by the piston 13 through the medium of a lever 30 fulcrumed in the wall 6, the ends of the lever being connected respectively to the stem of said piston and to said rod by a pin and slot connection 31.

Mounted upon a curved seat 32 in the chamber 29, and normally closing the air channel 28, is a hollow weight valve 33. The open end of this valve is provided with a screw threaded head or cap 34, and screwed into said head is a central stem 35, the upper end of which is adapted to have a vertical movement in a socket 36, provided in a screw threaded head or cap 37, which cap serves to securely close the opening to said chamber 29. The stem 35 is provided with a flange or collar 38, and between said flange and the head 34, is secured a flexible diaphragm 39, concavo-convex in cross section, the outer periphery of said diaphragm being secured between a shoulder 40, in the wall of the chamber 29 and the head 37. The diaphragm serves to cushion and prevent leakage of air, and also as a means by which the weight valve is assisted to rise and be held in raised position until released by the air pressure being cut off.

The numeral 41 indicates an automatic retarding device composed of a stem 42, screwed into the wall of the chamber *a* and a weight 43 vertically movable thereon, having approximately a wedge shape point adapted to engage either one of two correspondingly shaped sockets or notches 44 and 45, for a purpose hereinafter explained.

As shown in Fig. 1, the parts are in the position when the brakes are supposed to be set. To maintain a certain pressure in the train line, while the brakes are thus applied, the weight valve 33 is provided, it being designed to hold down a certain predetermined pressure. When the pressure in the train line or auxiliary reservoir becomes greater than the weight valve is designed to hold down, the said valve is lifted by the air rushing in through the pipe 8, from the auxiliary reservoir of the air brake system employed, permitting the air to pass into the chamber 29 and force the piston to its opposite position, uncovering the port 17, at the same time causing the rod 23 to move rearward, or in a direction opposite to the movement of the piston, through the fulcrumed lever, and close the port 27, thus cutting off communication from the train line, or auxiliary reservoir, or whichever one it may be connected with, to the chamber 29, and allowing the pressure in the train line to be increased to full running pressure. At the same time, that port 27 is closed, port 26 will be uncovered, and direct communication between the air brake cylinder and the outer air will be established by way of the exhaust port of the aforementioned triple valve, and communication will also be established between the brake cylinder and chamber *b* or, in other words, between chambers *a* and *b* through ports 17 and 18, in readiness for another application of the brakes. It being necessary to temporarily restrain the movement of the piston 13 until the air pressure on either side of said piston is sufficient to move the piston quickly to either normal position the automatically operated retarding device is provided.

It will be noted that the weight valve acts as an automatic check to a predetermined pressure between the train line and the piston, or other means controlling the operation of the retaining mechanism, or other working parts of the device. The weight valve being hollow it will be obvious that additional weight may be placed therein to hold down any desired predetermined pressure. It will also be noted that when the brakes are released, a certain amount of air flows from the auxiliary through the channel 28, into chamber 29, thus reducing the air pressure on the auxiliary side of the triple piston of the triple valve in the air brake system and automatically bleeds the auxiliary reservoir.

Various changes or modifications may be made in the details of construction of my invention, without limiting the scope thereof. For example, the piston stem and the rod 23 each may be made in one piece instead of two and three pieces respectively. As shown in Fig. 1, the outer end of the piston stem is provided with a screw threaded socket, and a tail piece 46, which carries the valve 18′ may be screwed therein, and both ends of the rod 23 provided with similar tail pieces 47 and 48, carrying the valves 24 and 25, respectively. And the springs inserted between the valves and their respective tail pieces may be dispensed with.

Claims.

1. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communication between the brake-cylinder and the outer air, an auxiliary reservoir-chamber, a valve-chamber in communication with said auxiliary reservoir-chamber, a valve operated by the piston for establishing and cutting off communication with said valve-chamber, and an automatically-oper-

ating valve for holding in check a predetermined pressure between the train-line and the piston.

2. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communications between the brake-cylinder and the outer air, means for retarding the movements of the piston, an auxiliary reservoir-chamber, a valve-chamber in communication with said auxiliary reservoir-chamber, a valve operated by said piston for establishing and cutting off communication with the valve-chamber, and an automatically operating valve for holding in check a predetermined pressure between the train-line and the piston.

3. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communications between the brake-cylinder and the outer air, means for retarding the movements of the piston, an auxiliary reservoir-chamber, a valve-chamber in communication with said auxiliary-reservoir-chamber, a valve operated by said piston for establishing and cutting off communication with the valve-chamber, and an automatically-operating valve for holding in check a predetermined pressure between the train-line and the piston.

4. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communication between the brake cylinder and the outer air, automatically-operating means for retarding the movements of the piston, an auxiliary reservoir-chamber, a valve-chamber in communication with said reservoir-chamber, a valve operated by the piston for establishing and cutting off communication with said valve-chamber, and an automatically-operating weight-valve for holding in check a predetermined pressure between the train-line and the piston.

5. In an automatic train-line recharging and brake-retaining device, the combination of a chamber divided into two communicating compartments, one of which is a brake-cylinder chamber, a piston adapted to establish and cut off communication between the brake-cylinder and the outer air, means for automatically retarding the movements of said piston, an auxiliary valve acting in conjunction with the piston to prevent leakage, an auxiliary reservoir-chamber, a valve-chamber in communication with said auxiliary reservoir-chamber, and the other compartment of the divided chamber, a valve operated by the piston to establish and cut off communication between auxiliary reservoir-chamber and said other compartment, and an automatically operating valve in the valve chamber for holding in check a predetermined pressure between the train-line and the piston.

6. An automatic train line recharging and brake-retaining device, the combination with a brake cylinder chamber, a piston for establishing and cutting off communication between the brake cylinder and the outer air, automatically operating means for temporarily retarding the inward movement of said piston, a chamber 5, a valve chamber, in communication with the auxiliary reservoir chamber, and chamber *b* and mechanism in said chamber 5 operated by the piston to establish and cut off communication with the valve chamber, of an automatically operating valve for holding in check a predetermined pressure between the train line and said piston.

7. In an automatic train line recharging and brake retaining device, the combination with a brake cylinder chamber, a piston cutting off communicaion between the brake-cylinder and the outer air, an automatically operating retarder for temporarily retarding the inward movement of said piston, chamber 5, a valve chamber in communication with the auxiliary reservoir chamber, and chamber *b*, valves in the auxiliary reservoir and exhaust chamber operated by the piston, for establishing and cutting off communication with the valve chamber and the outer air, of an automatically operating weight valve for holding in check a predetermined pressure between the train line and the piston.

8. In an automatic train line recharging and brake retaining device, the combination of a chamber divided into two communicating compartments, a piston having its head operating in one compartment and the end of its stem in the other, a valve operated by the piston stem to open and close communication between the two compartments, an auxiliary valve operating in conjunction with said valve, an auxiliary reservoir chamber, a valve chamber in communication with said auxiliary reservoir chamber and compartment *b*, a valve in the auxiliary reservoir chamber operated by the piston to open and close communication between said auxiliary reservoir chamber and compartment *b*, and a valve in the valve chamber for holding in check a predetermined pressure between the train line and the piston.

9. In an automatic train line recharging and brake retaining device, the combination with a piston for establishing and cutting off communication between the brake cylinder and the outer air, an auxiliary reservoir chamber, a valve chamber in communication with said auxiliary reservoir chamber, and a valve operated by the piston for establishing and cutting off communication with said valve chamber, and a weight valve in the valve chamber for holding in check a predetermined pressure between the train

line and said piston, said weight valve having a concave recess or socket adapted to seat on a correspondingly shaped projection or seat.

10. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communication between the brake-cylinder and the outer air, an auxiliary reservoir chamber, an exhaust-chamber, a reciprocatory-rod provided with valves, and a fulcrumed lever connecting said rod with the piston, whereby the rod is operated by said piston to establish and cut off communication with the valve-chamber and to open and close the exhaust-port.

11. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communication between the brake-cylinder and the outer air, means for retarding the movements of the piston, an auxiliary reservoir-chamber, an exhaust-chamber, a valve-chamber, in communication with said exhaust-chamber, a reciprocatory-rod provided with valves, and a fulcrumed lever connecting said rod with said piston, whereby the rod is operated by the piston to establish and cut off communication with the valve-chamber and to open and close the exhaust-port.

12. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communication between the brake-cylinder and the outer air, an auxiliary reservoir-chamber, an exhaust-chamber, a reciprocatory-rod provided with valves, a fulcrumed lever connecting said rod with the piston, whereby the rod is operated by said piston to establish and cut off communication with the valve-chamber and to open and close the exhaust-port, and an automatically-operating valve for holding in check a predetermined pressure between the train-line and the piston.

13. In an automatic train-line recharging and brake-retaining device, the combination of a piston for establishing and cutting off communication between the brake-cylinder and the outer air, means for retarding the movements of the piston, an auxiliary reservoir-chamber, an exhaust-chamber, a valve-chamber in communication with said exhaust-chamber, a reciprocatory-rod provided with valves, a fulcrumed lever connecting said rod with said piston, whereby the rod is operated by the piston to establish and cut off communication with the valve-chamber and to open and close the exhaust-port, and an automatically-operating valve for holding in check a predetermined pressure between the train-line and the piston.

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

LEROY B. JAHN.

Witnesses:
WM. H. BRERETON,
SULLIVAN V. JOHNSON.