

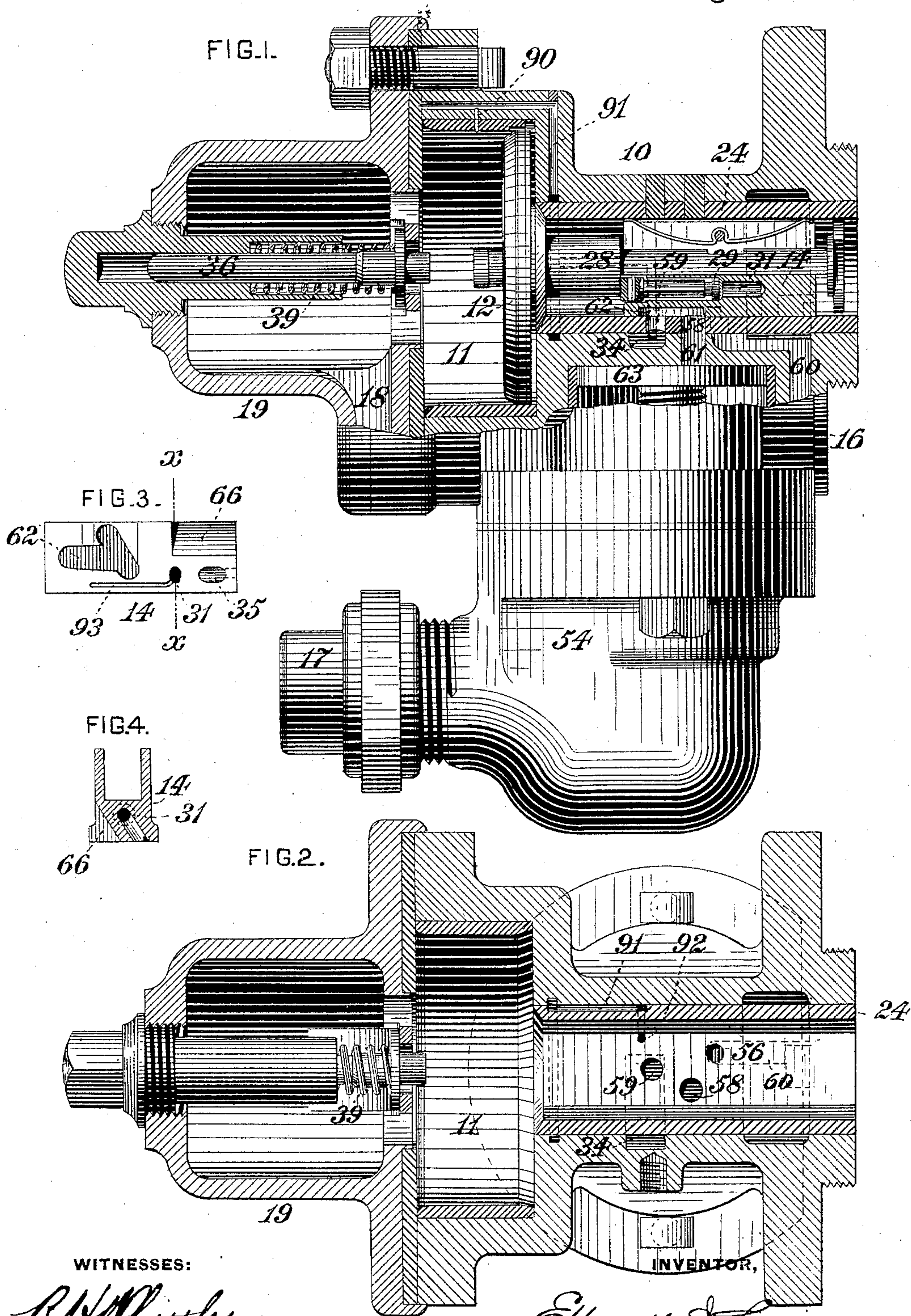
(No Model.)

E. J. LEWIS.

TRIPLE VALVE FOR AUTOMATIC BRAKE APPARATUS.

No. 433,598.

Patented Aug. 5, 1890.



WITNESSES:

*R. H. Whitley*  
*F. E. Gaither*

INVENTOR,

*Ellsworth J. Lewis*  
*by J. Snowden Bell* Att'y.



# UNITED STATES PATENT OFFICE.

ELLSWORTH J. LEWIS, OF WARRENTON, OHIO.

## TRIPLE VALVE FOR AUTOMATIC BRAKE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 433,598, dated August 5, 1890.

Application filed May 21, 1890. Serial No. 352,651. (No model.)

*To all whom it may concern:*

Be it known that I, ELLSWORTH J. LEWIS, a citizen of the United States, residing at Warrenton, in the county of Jefferson and State of Ohio, have invented or discovered a certain new and useful Improvement in Triple Valves for Automatic Brake Apparatus, of which improvement the following is a specification.

10 The object of my invention is to effect a simple and inexpensive adaptation of triple valves of the construction which is now standard in air-brake practice, to the additional function of supplying air directly from the  
15 main reservoir and train-pipe to the brake-cylinder, while the brakes are set, without releasing the brakes, in order to maintain the continuous application of the brake-shoes to the wheels while descending long and heavy  
20 grades, and thereby to compensate for leakage from the brake-cylinders during such periods without the necessity of releasing the brakes to recharge the auxiliary reservoirs or  
25 of employing the usual pressure-retaining valves for the retention of a determined low pressure in the brake-cylinders.

To this end my invention, generally stated, consists in a triple valve having a lateral port in its piston-chamber located in position to  
30 be closed by the piston when the brakes are applied with a determined degree of force, and communicating with passages leading to a port in a valve-bushing establishing communication from the train-pipe to the brake-  
35 cylinder when the piston is moved a limited distance from the lateral port of its chamber.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is  
40 a view, partly in longitudinal section and partly in elevation, of a Westinghouse quick-action triple valve with my improvement applied thereto; Fig. 2, a longitudinal section through the same at right angles to the section of Fig. 1 with the piston and slide valve  
45 removed; Fig. 3, a bottom view of the slide-valve; and Fig. 4, a transverse section through the same at the line  $x x$  of Fig. 3.

My invention is herein exemplified as ap-

plied in connection with the triple-valve 50 mechanism set forth in the Letters Patent No. 376,837, granted and issued to George Westinghouse, Jr., under date of January 24, 1888, and the same being familiar in practice to those skilled in the art, and being fully  
55 described and shown in said Letters Patent, its detailed features of construction, other than so far as may be necessary to clearly explain my present invention, will not be herein described. 60

In the practice of my invention I form a lateral port 90 in the chamber 11, in which the piston 12 of the triple valve reciprocates in the usual manner to effect the application and release of the brakes. The port 90, which is located in such position in the piston-chamber as to be closed by the piston 12 when moved forward in its chamber to the position which it occupies when the brakes are applied with a  
65 determined degree of force less than the maximum, establishes communication between the main air-reservoir and train-pipe and a port 92, in the valve-bushing 24, in advance of the port 56 of the passage 60, which leads to the brake-cylinder connection 16, the line of such  
70 communication being, when the port 90 is uncovered by the piston 12 when moved from said port in the direction of the valve-bushing, through the train-pipe connection 17, supplemental valve-chamber 54, passage 18, drain-cup 19, and ports 20 to the piston-chamber 11, and therefrom through the port 90 and  
75 through a passage 91 communicating therewith to the port 92 in the valve-bushing. The passage 91 extends first longitudinally in the wall of the piston-chamber, thence transversely in the valve-body 10 and around the valve-bushing, thence longitudinally in the bushing or in the adjacent valve-body to a point in line with the port 92, and thence  
80 around the bushing to said port. Communication is established from the port 92 to the brake-cylinder, when the slide-valve 14 is brought to and stands in proper position therefor during the period of application of  
85 the brakes by a passage 93, which extends longitudinally on the face of the slide-valve 14, from the opening of the graduating-valve



port 31 to a point at a distance therefrom about equal to the longitudinal distance apart of the valve-bushing ports 56 and 92. In all particulars other than those above specified, the triple-valve mechanism accords, both structurally and operatively, with that set forth in Patent No. 376,837, before referred to.

In operation the brakes are applied by a reduction of pressure in the train-pipe in the ordinary manner to effect the desired retardation of momentum of the train in descending a grade, and the piston 12 is first brought into position to cover and close the lateral port 91 of its chamber, and is thereafter, by the reduction of pressure by expansion in the auxiliary reservoir or the action of the graduating spring 39, moved backward sufficiently to uncover said port without moving the slide-valve after the graduating-valve 29 has been closed. In this position communication between the piston-chamber, which is in communication with the train-pipe on the outer side of the piston 12, and the valve-bushing port 92 is established through the port 90 and passage 91, and from the port 92 to the brake-cylinder, through the passage 93 in the face of the slide-valve and the ports 56 and 60.

In order to maintain the application of the brakes and compensate for any leakage from the brake-cylinder a slight increase of pressure, not sufficient in degree to release the brakes, is made in the train-pipe by the engineer, such increase of pressure passing into the brake-cylinder and preventing the release of braking-pressure which would otherwise be due to leakage therefrom. It will thus be seen that the necessity of employing a pressure-retaining valve to retain a limited degree of pressure in the brake-cylinder and prevent the release of the brakes in the recharging of the auxiliary reservoir preliminary to a further supply to the brake-cylinder therefrom is obviated by my improvement, the op-

eration of which in nowise interferes with or contravenes the ordinary operation of the triple-valve mechanism either in the application of the brakes, whether for service or emergency stops, or in their release.

I claim as my invention and desire to secure by Letters Patent—

1. In a triple-valve device for automatic brake mechanisms, a piston-chamber having a lateral port for the passage of fluid under pressure from the train or brake pipe to the brake-cylinder upon increase of train-pipe pressure during the period of application of the brakes and while the piston is adjacent to the outward position to which it moves in making service-stops, substantially as set forth.

2. In a triple-valve device for automatic brake mechanisms, a piston-chamber having a lateral port located in position to be closed by the piston when the brakes are applied with a determined degree of force and opened by backward movement of the piston, said port communicating with a passage leading to a port in the valve-bushing which communicates with the brake-cylinder in and by the opening of the lateral port by the piston, substantially as set forth.

3. In a triple-valve device for automatic brake mechanisms, the combination of a valve-casing having a lateral port in its piston-chamber, and a communicating passage leading to a port in the valve-bushing, and a slide-valve having a passage on its face establishing communication between the valve-bushing port and a port leading to a brake-cylinder, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ELLSWORTH J. LEWIS.

Witnesses:

J. SNOWDEN BELL,  
R. H. WHITTELESEY.