

(No Model.)

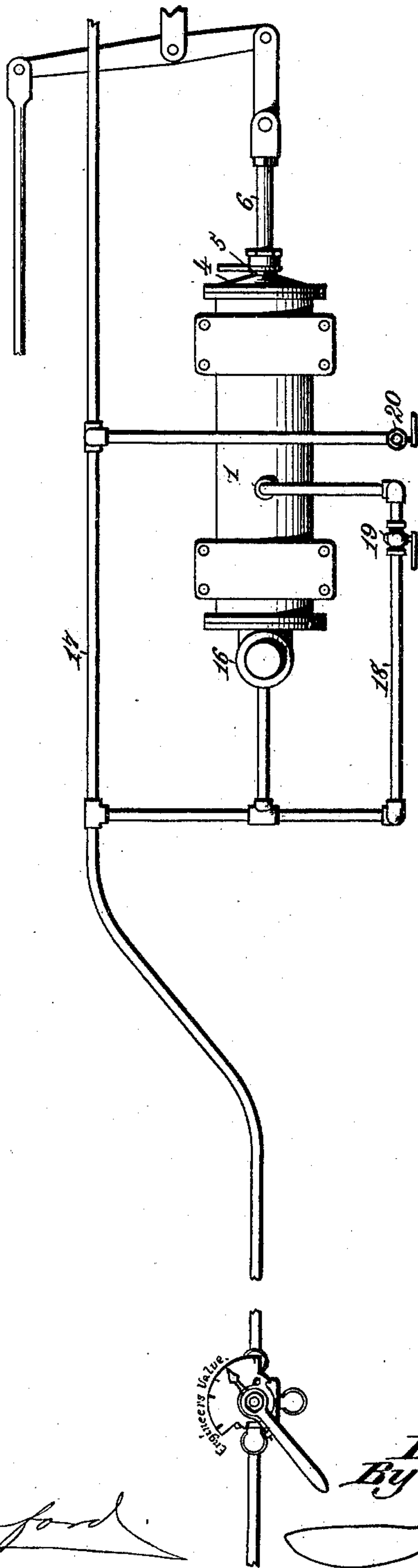
3 Sheets—Sheet 1.

E. G. SHORTT.  
AUTOMATIC BRAKE MECHANISM.

No. 473,789.

Patented Apr. 26, 1892.

*Fig. 1.*



*Witnesses.*  
*Robert G. Smith,*  
*J. A. Rutherford.*

*Inventor.*  
*Edward G. Shortt.*  
*By* *James L. Norris,*  
*Atty.*

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3 Sheets—Sheet 2.

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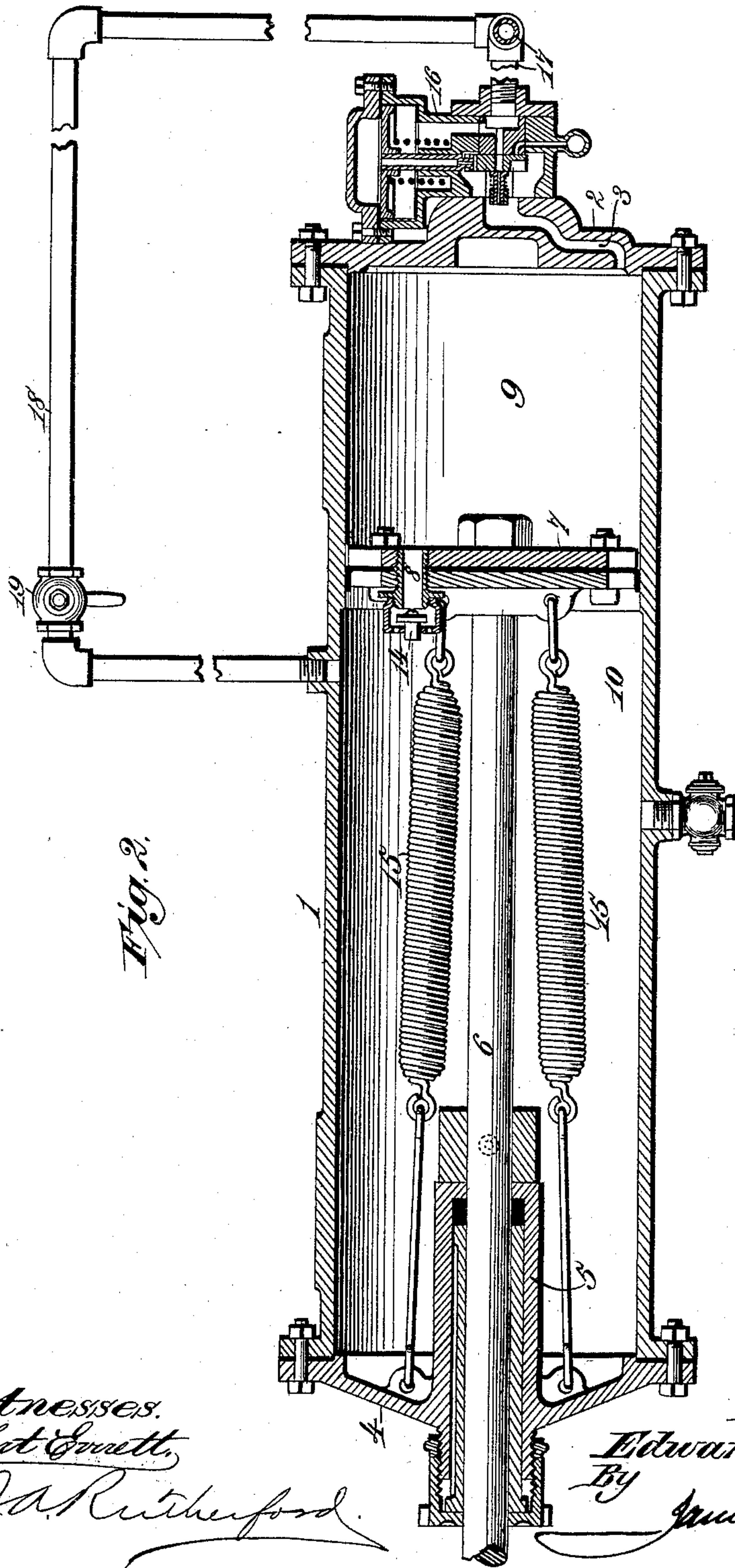


Fig. 2.

Witnesses.  
Robert Emmett.  
J. A. Rutherford.

Inventor.  
Edward G. Shortt.  
By James L. Norris.  
Atty.

(No Model.)

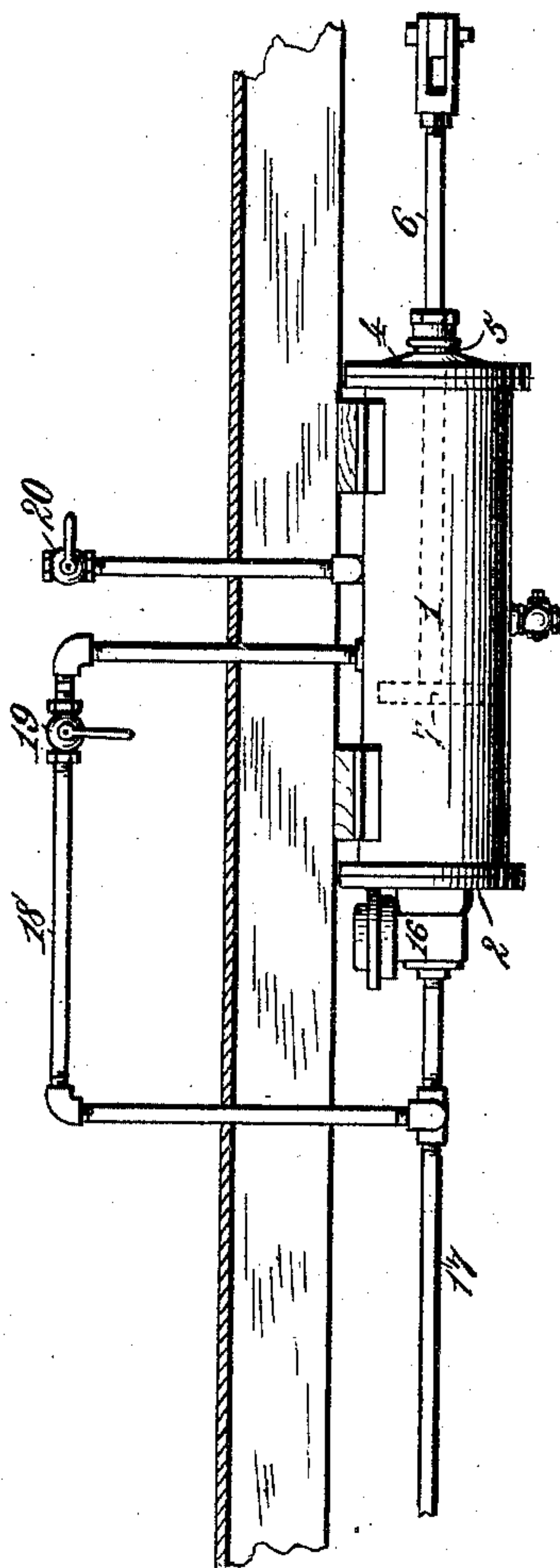
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Patented Apr. 26, 1892.

Fig. 3.



Witnesses.  
*Phil Everett,*  
*J. A. Rutherford.*

Inventor.  
*Edward G. Shortt.*  
By *James L. Norris,*  
Atty.



# UNITED STATES PATENT OFFICE.

EDWARD G. SHORTT, OF 'CARTHAGE, ASSIGNOR TO CHARLES G. EMERY,  
TRUSTEE, OF NEW YORK, N. Y.

## AUTOMATIC BRAKE MECHANISM.

SPECIFICATION forming part of Letters Patent No. 473,789, dated April 26, 1892.

Application filed October 21, 1891. Serial No. 409,397. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD G. SHORTT, a citizen of the United States, residing at Carthage, in the county of Jefferson and State of New York, have invented new and useful Improvements in Automatic Brake Mechanism, of which the following is a specification.

This invention relates to automatic brake mechanism wherein the brakes are applied or released by reducing or restoring the fluid-pressure in a cylinder at one side of a movable diaphragm or partition, the opposite side of which is exposed to pressure of air in an auxiliary compressed-air reservoir on the car.

The objects of my invention are to avoid bleeding the air-reservoir for the purpose of setting or applying the brakes on the car or cars disconnected from the main reservoir, and to provide novel means whereby the conductor's valve can be utilized to apply the brakes several times, if occasion demands, on a car or cars disconnected from the main reservoir of a train or locomotive.

To accomplish these objects my invention involves the features of construction and combination or arrangement of devices hereinafter described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a plan view showing sufficient of an automatic brake system to illustrate my invention. Fig. 2 is a vertical central sectional view through the cylinder which constitutes the compressed-air reservoir and the brake-chamber, and Fig. 3 is a sectional side elevation showing the by-pass pipe or tube so arranged that the valved portion thereof can be located inside the car.

In order to enable those skilled in the art to make and use my invention, I will now describe the same in detail, referring to the drawings, wherein—

The numeral 1 indicates a brake-cylinder having at one end a suitable head 2, provided with a port 3, and at the opposite end a head 4, suitably bolted in position and carrying a stuffing-box 5, through which passes a brake-operating rod 6, rigidly or immovably attached to a diaphragm or partition 7 for the purpose of actuating the car-brakes. The connection between the brake-operating rod

and the brakes may be of any well-known construction and therefore it is not deemed necessary to illustrate the same. The movable diaphragm or partition here illustrated is in the form of a piston having a passage-way 8 for placing the brake-chamber 9 at one side of the piston in communication with the compressed-air reservoir 10 at the opposite side of the piston. The passage-way 8 is controlled by a check-valve 14 in a manner substantially the same as described in my Letters Patent No. 469,176, dated February 16, 1892. The brake-operating rod 6 extends through the compressed-air reservoir 10, and in the latter is arranged a pair of spiral springs 15 of considerable power, having one end connected with the piston and the opposite end with the cylinder-head 4. The springs are of the type known as "retractile" springs, and consequently their tendency is to pull or draw the diaphragm or partition in a direction to release the brakes and compress the air contained in the air-reservoir. The port 3 of the cylinder-head 2 connects with a relief or exhaust valve mechanism contained in a casing 16, and the train-pipe or a section 17 thereof connects with the relief or exhaust valve mechanism. This valve is preferably constructed and arranged to operate as described in my Letters Patent No. 466,434, dated January 5, 1892; but it may be of any construction which will automatically release the air from the brake-chamber 9 and discharge such air into the atmosphere when pressure in the train-pipe is reduced or released.

The air-reservoir 10 is charged when the parts are placed in working position in the following manner: When air at forty-pounds pressure, for example, is introduced at the commencement, it will flow into the brake-chamber 9 and through the passage 8 into the closed air-reservoir 10, thereby producing an equal pressure of forty pounds at each side of the diaphragm or partition 7. On allowing the air to escape from the chamber 9 through the relief-valve the diaphragm or partition moves toward the port 3, the air in the reservoir 10 expands, thereby reducing the actual air-pressure therein, and the valve 14 instantly closes against its seat, so that there is an air-pressure of forty pounds in



the air-reservoir, but only an acting pressure of thirty pounds on the diaphragm or partition, if the springs 15 have a pulling-power or retractile force of ten pounds. This movement of the diaphragm or partition applies the brakes. In releasing the brakes the air entering the brake-chamber 9 equalizes the air-pressure in such chamber and the reservoir 10, and instantly the power of the springs 15 moves the diaphragm or partition in the direction to release the brakes, so that gradually the air in the reservoir 10 is additionally compressed and the valve 14 is held seated. The valve 14 is always held seated, except when air is renewed in the reservoir 10 to compensate for leakage from such reservoir.

The compressed-air reservoir 10 is adapted to be placed in communication with the brake-chamber 9 through the medium of a by-pass pipe or tube 18, having a valve or cock 19 of any suitable construction for controlling the flow of air from the reservoir through the pipe or tube. As here illustrated, the by-pass pipe or tube connects by a suitable coupling with the train-pipe or the section 17 thereof, so that if the car be disconnected from the main reservoir of the train or locomotive and the conductor's valve 20 be operated to release the fluid-pressure from the pipe-section 17 and from the brake-chamber 9 it is possible to subsequently release the brakes without bleeding the air-reservoir 10 by simply opening the cock 19, whereupon compressed air will flow through the by-pass pipe or tube 18 to the brake-chamber 9. As this occurs the springs 15 pull or draw the piston 7 in a direction to release the brakes. If now the valve 19 be closed and the conductor's valve be again operated to release the fluid-pressure from the pipe-section 17 and from the brake-chamber 9 for the purpose of applying the brakes a second time and the conductor's valve be then closed, it is possible to again release the brakes by opening the valve 19 and permitting compressed air from the reservoir 10 to flow through the by-pass pipe or tube into the brake-chamber 9, when the operation before described occurs. I have practically demonstrated that by this combination and mode of operation it is possible to apply and release the brakes several times on a car which has been disconnected from the main reservoir of a train or locomotive.

If the relief or exhaust valve be employed in the train-pipe, it should be located between the cylinder 1 and the point where the by-pass pipe or tube 18 connects with the train-pipe or the section 17 thereof for the purpose of establishing pressure in the train-pipe first.

The valve 19 of the by-pass pipe or tube is preferably located inside the car, so that it can be conveniently operated by the con-

ductor in such manner that these valves can be alternately operated. I do not, however, confine myself to so arranging the by-pass pipe or tube that its valve will be inside the car, for any other arrangement may be employed and any suitable means may be adopted for conveniently operating such valve.

I have described and shown my invention in connection with a cylinder wherein the movable diaphragm or partition divides the cylinder into a compressed-air reservoir and a brake-chamber, as in my application for Letters Patent filed March 30, 1891, Serial No. 387,011; but I do not wish to be understood as confining myself to this particular arrangement of the air-reservoir, for obviously this auxiliary reservoir can be otherwise arranged and constructed, so that the contained air will act on the diaphragm or partition to apply the brakes when fluid-pressure in the brake-chamber is released.

Having thus described my invention, what I claim is—

1. The combination, with a compressed-air reservoir, a brake-chamber, a diaphragm or partition, a brake-operating rod connected with the diaphragm or partition, and a pipe for releasing and restoring fluid-pressure in the brake-chamber, of a valved by-pass for placing the reservoir in communication with the brake-chamber to transfer air from the reservoir to the brake-chamber for releasing the brakes and rendering the parts susceptible of applying the brakes while the car is disconnected from the main air-reservoir of a train or locomotive, substantially as described.

2. The combination, with a cylinder, a diaphragm or partition dividing the cylinder into a compressed-air reservoir and a brake-chamber and having means for admitting air to the reservoir for charging the same, a section of a train-pipe for supplying the compressed air to the brake-chamber, and a conductor's valve, of a by-pass pipe or tube having a part extending into the car in proximity to the conductor's valve and provided with a cock or valve for placing the reservoir in communication with the brake-chamber to transfer air from the reservoir to the brake-chamber for releasing the brakes and rendering the parts susceptible of subsequently applying the brakes while the car is disconnected from the main air-reservoir of a train or locomotive, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

EDWARD G. SHORTT. [L.S.]

Witnesses:

JAMES L. NORRIS,

JAMES A. RUTHERFORD.