No. 785,513. PATENTED MAR. 21, 1905.

H. MINNICK.

AIR BRAKE.

APPLICATION FILED SEPT. 9, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

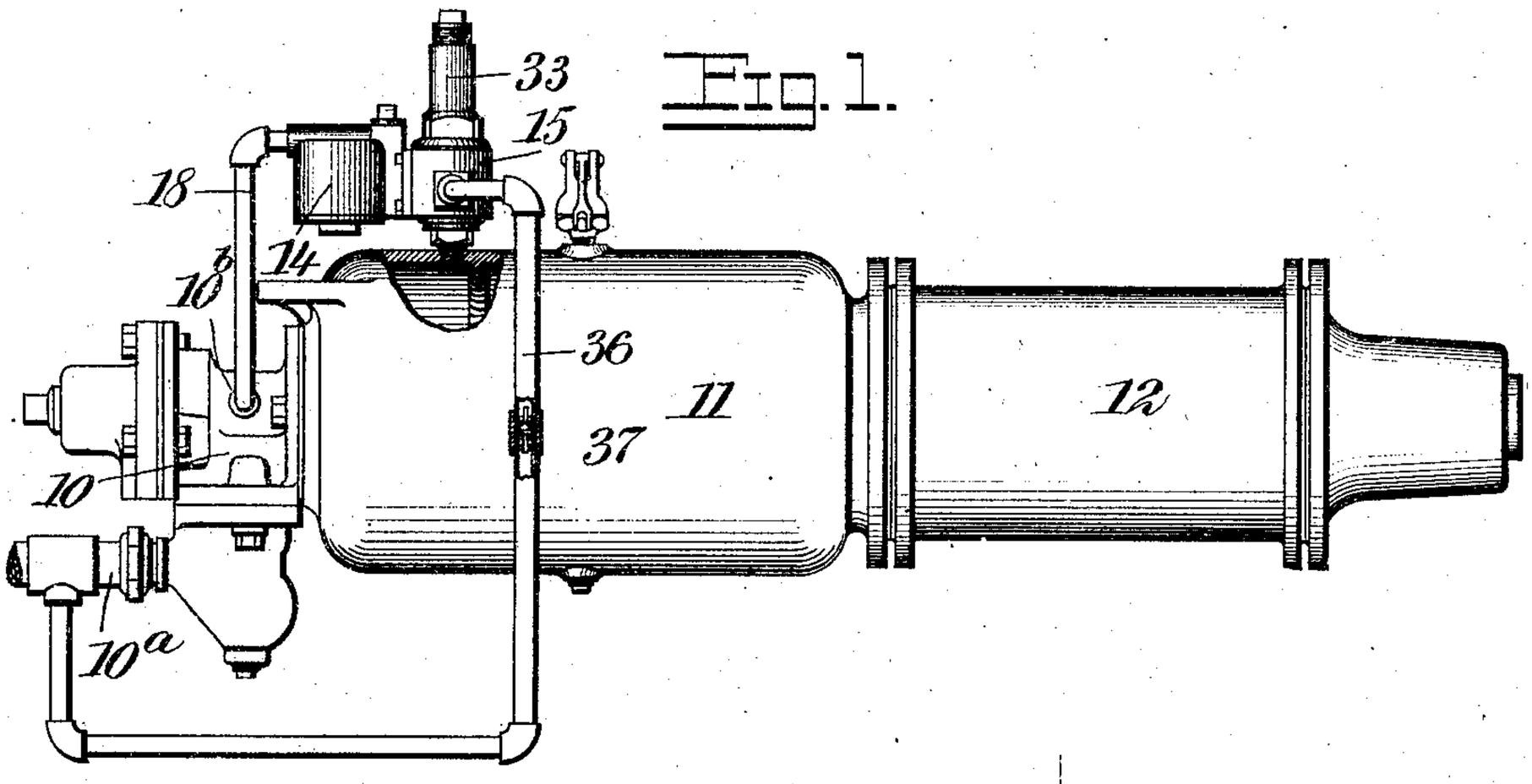
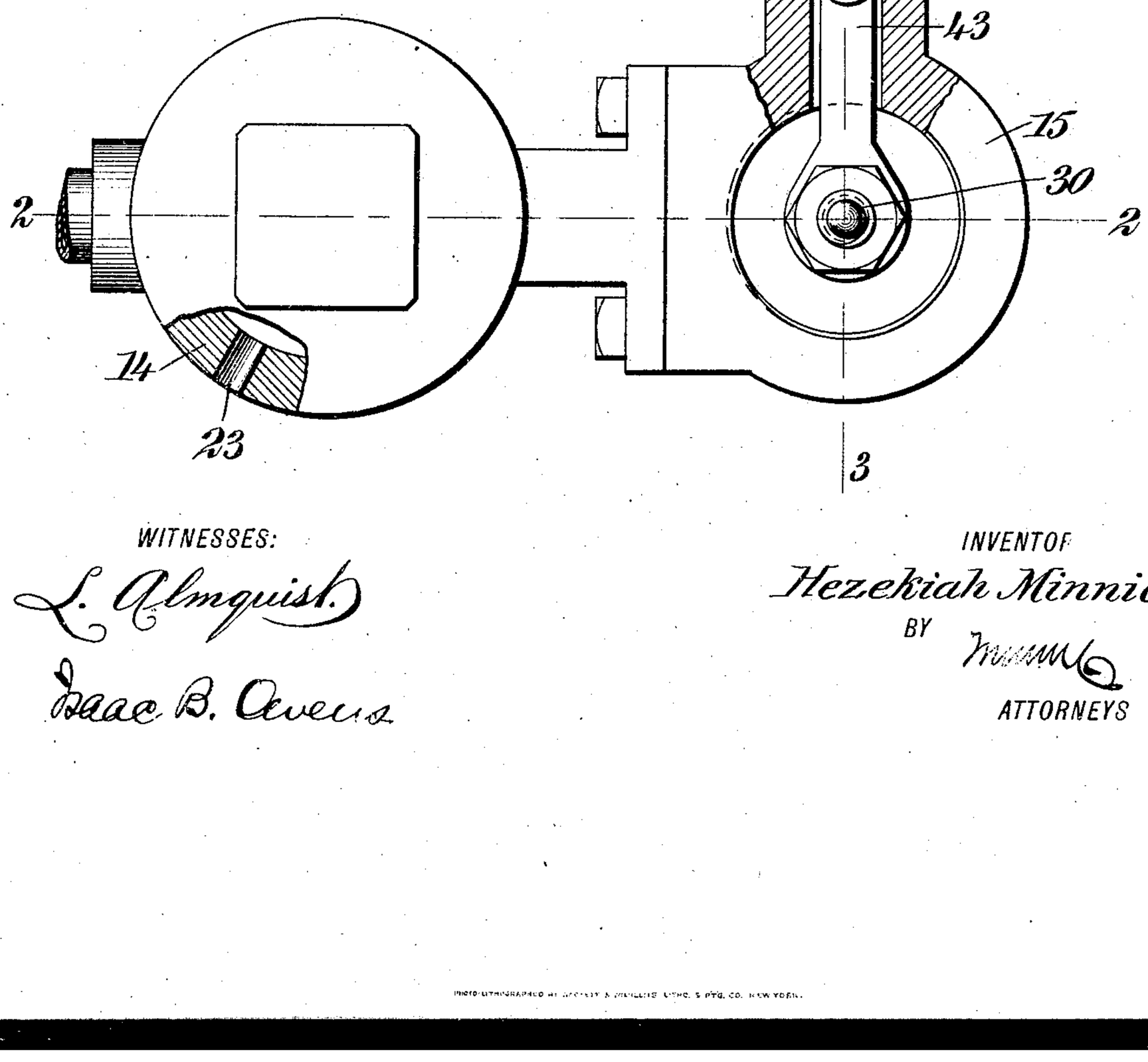


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 3.

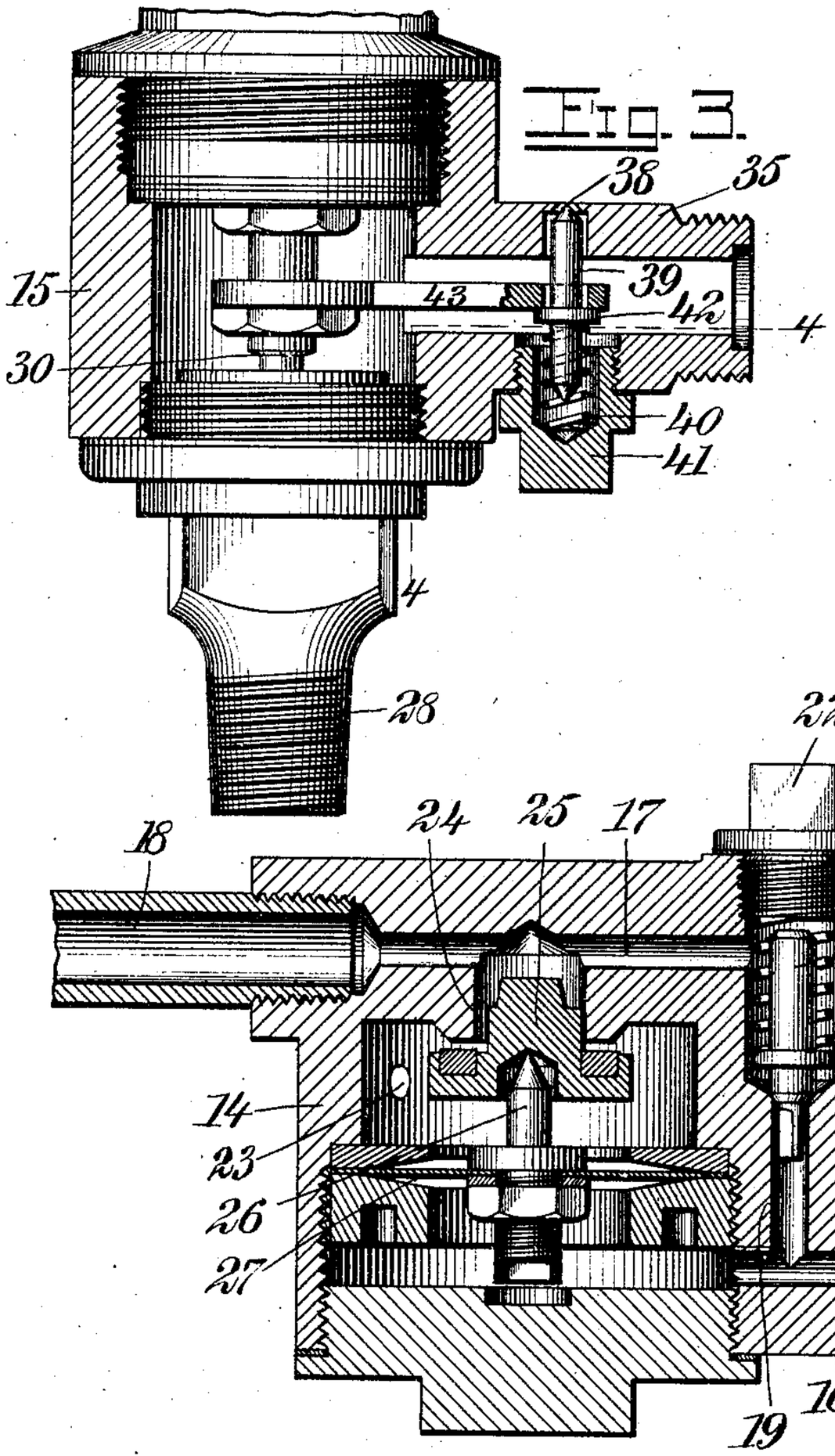
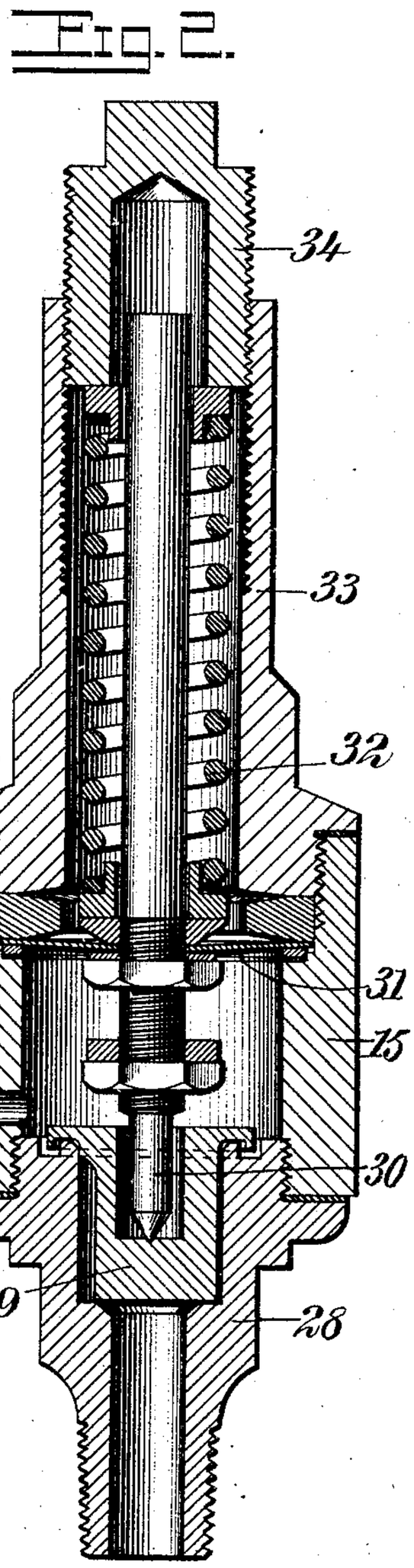


Fig. 2.



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No. 785,513. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

HEZEKIAH MINNICK, OF LAREDO, TEXAS.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 785,513, dated March 21, 1905.

Application filed September 9, 1904. Serial No. 223,864.

To all whom it may concern:

Be it known that I, HEZEKIAH MINNICK, a citizen of the United States, and a resident of Laredo, in the county of Webb and State of Texas, have invented a new and Improved Air-Brake, of which the following is a full, clear, and exact description.

The invention relates to an attachment for the usual automatic air-brake systems by means of which the brakes may be applied and the auxiliary reservoirs recharged simultaneously.

The invention resides in certain novel features, which will be fully set forth hereinafter and pointed out in the claims.

Reference is had to the accompanying drawings, showing the preferred embodiment of my invention, in which drawings like characters of reference indicate like parts in the several views, and in which—

Figure 1 is a view showing the standard triple valve, auxiliary reservoir, and brake-cylinder and illustrating my attachment applied thereto. Fig. 2 is a section through the attachment on the line 2 2 of Fig. 4. Fig. 3 is a section on the line 3 3 of Fig. 4. Fig. 4 is a bottom plan view with the auxiliary reservoir communication removed and other parts broken away and partly in section on the line 4 4 of Fig. 3.

In Fig. 1, 10 indicates a triple valve, 10^a the train-line communication, and 10^b the triple exhaust. 11 indicates the auxiliary reservoir, and 11 the brake-cylinder, all of which parts may be of the usual or any desired form.

The attachment comprises two casings 14 and 15, communicating by a port 16. The casing 14 has in its upper portion a port 17, communicating with a pipe 18, leading from the triple exhaust. A port 19 establishes communication between the passages 16 and 17, and in this port 19 is a check-valve 20, which opens to permit pressure to pass from the passage 16 to the passage 17 and which is seated by a spring 21, the tension of which may be regulated by a screw-plug 22. The interior of the chamber 14 has a port 23 communicating with the atmosphere, and a port 24 establishes communication between the passage 17 and the interior of the chamber 14. This port 24 is commanded by a valve 25, which opens into the chamber 14 and which is closed by a stem 26, attached to a diaphragm 27, lying between the atmospheric port 23 and the passage 16, before described.

The casing 15 has a nipple 28 communicating with the auxiliary reservoir, and this nipple is commanded by a valve 29, which opens from the auxiliary reservoir into the casing 16. Said valve 29 is normally seated by a stem 30, extending through the casing 15 and having a diaphragm 31 attached thereto, so that when sufficient fluid-pressure pervades the chamber 15 the diaphragm 31 will be lifted and the valve 29 permitted to unseat. Bearing on the side of the diaphragm 31 opposite the valve 29 is a spring 32, which acts to hold the valve 29 yieldingly seated. This valve is contained within a tubular extension 33 of the casing 15 and is engaged by a regulating-nut 34, screwed into the outer end of said extension.

The casing 15 has a laterally-extending connection 35, adapted to be connected with a pipe 36, extending from the train-line communication 10^a. Said pipe 36 contains a check-valve 37, acting to prevent the return of pressure from the train-line through the pipe 36. In said connection 35 is a port 38, leading to the atmosphere. This port is commanded by a valve 39, located within the connection 35 and yieldingly seated by a spring 40, which presses against the valve and which is engaged by a regulating-cap 41, screwed into the said connection 35. The valve 39 has a collar 42 thereon, and this collar is engaged by an arm 43, attached to the stem 30. When the spring 32 is active and the stem 30 is in its lowered position, the valve 39 is held open, as shown in Fig. 3; but when the pressure in the chamber 15 becomes sufficient to elevate the diaphragm 31 against the spring 32 the valve 39 will be allowed to seat under the action of the spring 40.

The operation of the apparatus is as follows: Upon raising the train-line pressure the check-valve 37 will seat, the triple slide will be thrown over to full release, and the auxiliary reservoir will be charged in the usual manner. The spring 32, seating the valve 29, should be

set to hold the valve seated against the ordinary auxiliary-reservoir pressure, (generally seventy pounds,) and to apply the brakes the pressure in the train-line and auxiliary should be raised above this ordinary pressure, so as to lift the valve 29 from its seat and to permit the auxiliary-reservoir pressure to pervade the casing 15 and the casing 14 below the diaphragm 27. As the valve 29 opens it raises the stem 30, and the arm 43 disengages the collar 42 on the valve 39, and this valve then seats under the action of the spring 40, the valve 39 remaining seated as long as the valve 29 is unseated. When the pressure from the auxiliary reservoir enters the casing 14 below the diaphragm 27, it moves up the pin 26 and seats the valve 25, holding the same seated until this pressure is exhausted from the casing 14 and the pressure entering the casing 14 from the auxiliary reservoir lifts the valve 20, permitting the pressure to pass through the pipe 18 into the triple exhaust, and the triple slide being in full release position the auxiliary pressure will pass through the triple exhaust and slide and thence into the brake-cylinder, thus applying the brakes. As long as the train-line pressure is kept raised slightly above the normal the brakes will be held applied. In order to release the brakes, a momentary train-line reduction should be made sufficient to permit a small part of the pressure from the chamber 15 and chamber 14 below the diaphragm 27 to pass out into the atmosphere, which movement of the pressure takes place through the train-line and brake-valve. The instant the train-line pressure reaches the normal (assumed to be seventy pounds) the valve 29 will seat under the action of the spring 32, and this will carry with it the valve 39, opening the same, so that the entire pressure from the chamber 15 and the chamber 14 below the diaphragm will be exhausted. The valve 20 will then seat, and the pressure on the diaphragm 27 being now relaxed the valve 25 will open and the pressure in the brake-cylinder will be exhausted through the triple exhaust-pipe 18 and port 23, which port is in the casing 14 above the diaphragm 27. In this manner the brakes will be released. In connection with the release of the brakes as above described it is noted that when the train-line pressure is reduced in order to reduce the pressure in the chamber 15 and permit the valve 29 to seat the triple valve will have a tendency to move toward service-application position; but this movement may be almost immediately checked by a subsequent rise in the train-line pressure, restoring this pressure to the normal and restoring the triple slide to full release position, so that the triple exhaust-port is placed in communication with the brake-cylinder. Upon the release of the brakes there is still a full normal pressure in the auxiliary reservoir, and consequently the brakes may be instantly reapplied. Also during the time that the brakes are applied the triple slide will be in full release position, the pressure being retained in the cylinder by reason of the valve 25 bearing on its seat, and consequently the auxiliary reservoir may be charged up to its full capacity without releasing the brakes. The brakes, however, may be applied either by train-line reduction, as ordinarily, or by raising the train-line pressure above that of the auxiliary, the release of the brakes being effected by a momentary train-line reduction, instantly returning to normal train-line pressure. This momentary reduction need be but a few pounds and the normal pressure restored before the triple slide has time to take the service-application position. This is so by reason of the fact that it is only necessary to exhaust a few pounds from the casing 15 in order to relieve the diaphragm 31 of that pressure which holds the valve 29 against the strength of the spring 32. The instant this valve closes the valve 39 opens and completes the reduction of the pressure in the chambers 14 and 15, bringing this pressure to that of the atmosphere.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. An air-brake attachment comprising two communicating casings, one casing having atmospheric communication, a communication adapted to be connected to a triple exhaust, a valve controlling said communication, a diaphragm in said casing for actuating the valve, a port connecting said triple-exhaust communication with the other casing, a yieldingly-seated valve controlling said port, the second or other casing having communications adapted respectively to connect with the auxiliary reservoir and train-line, a valve controlling the auxiliary-reservoir connection, a spring-actuated member tending to seat said valve, and a diaphragm connected with the spring-actuated member to move the same in inactive position.

2. An air-brake attachment comprising two communicating casings, one casing having atmospheric communication, a communication adapted to be connected to a triple exhaust, a valve controlling said communication, a diaphragm in said casing for actuating the valve, a port connecting said triple-exhaust communication with the other casing, a yieldingly-seated valve controlling said port, the second or other casing having communications adapted respectively to connect with the auxiliary-reservoir connection, a spring-actuated member tending to seat said valve, and a diaphragm connected with the spring-actuated member to move the same in inactive position, said train-line communications having a port leading to the atmosphere, a valve commanding the same, means tending yieldingly to seat the valve, and a connection between the valve and the said spring-actuated member of the second casing whereby to open the valve.

3. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to admit pressure from the auxilary reservoir to the triple exhaust, means for holding said valve yieldingly to its seat, said valve opening by a certain pressure within the auxiliary reservoir, and means for automatically controlling a vent to the atmosphere communicating with the triple exhaust.

4. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for holding said valve yieldingly to its seat, said valve opening by a certain pressure within the auxiliary reservoir, and means for automatically controlling a vent to the atmosphere communicating with the triple exhaust, the last-named means being actuated by the fluid-pressure in said communication between the auxiliary reservoir and the triple exhaust.

5. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for holding said valve yieldingly to its seat, said valve opening by a certain pressure within the auxiliary reservoir, means for automatically controlling a vent to the atmosphere communicating with the triple exhaust, and means for exhausting the pressure from the said communication at a point between the valve and the triple exhaust.

6. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for holding said valve yieldingly to its seat, said valve opening by a certain pressure within the auxiliary reservoir, means for automatically controlling a vent to the atmosphere communicating with the triple exhaust, and a second valve connected with the first-named valve and controlling an atmospheric vent from the said communication between the auxiliary reservoir and the triple exhaust.

7. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for holding said valve yieldingly to its seat, said valve opening by a certain pressure within the auxiliary reservoir, means for automatically controlling a vent to the atmosphere communicating with the triple exhaust, and means establishing communication between the train-line and the said communication between the auxiliary reservoir and the triple exhaust at a point between the said valve and the triple exhaust.

8. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for holding said valve yieldingly to its seat, said valve opening by a certain pressure within the auxiliary reservoir, means for automatically controlling a vent to the atmosphere communicating with the triple exhaust, means establishing communication between the train-line and the said communication between the auxiliary reservoir and the triple exhaust at a point between the said valve and the triple exhaust, and a second valve controlling an atmospheric vent from the said communication between the auxiliary reservoir and the triple exhaust at a point between the first-named valve and the triple exhaust, the second-named valve having connection with the first valve for the purpose specified.

9. A recharging mechanism for automatic air-brake systems, comprising means establishing communication between the auxiliary reservoir and triple exhaust, a valve controlling said communication and opening to admit pressure from the reservoir to the exhaust, means for yieldingly seating said valve, the valve opening by the force of a predetermined pressure in the auxiliary reservoir, a valve controlling the vent to the atmosphere from the triple exhaust, and means for actuating the valve by the fluid-pressure in said communication between the auxiliary reservoir and the triple exhaust at a point between the first-named valve and the triple exhaust.

10. A recharging mechanism for automatic air-brake systems, comprising means establishing communication between the auxiliary reservoir and triple exhaust, a valve controlling said communication and opening to admit pressure from the reservoir to the exhaust, means for yieldingly seating said valve, the valve opening by the force of a predetermined pressure in the auxiliary reservoir, a valve controlling the vent to the atmosphere from the triple exhaust, means for actuating the valve by the fluid-pressure in said communication between the auxiliary reservoir and the triple exhaust at a point between the first-named valve and the triple exhaust, and means for exhausting the pressure from said communication between the auxiliary reservoir and the triple exhaust at a point between the first-named valve and the triple exhaust.

11. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication, the valve opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for yieldingly seating the valve, the valve opening automatically when a predetermined pressure has been introduced into the auxiliary reservoir, and means for exhausting the pressure from said communication at a point between the said valve and triple exhaust.

12. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication, the valve opening to admit pressure from the auxiliary reservoir to the triple exhaust, means for yieldingly seating the valve, the valve opening automatically when a predetermined pressure has been introduced into the auxiliary reservoir, means for exhausting the pressure from said communication at a point between the said valve and triple exhaust, and a check-valve introduced in the said communication at a point between the said exhausting means and the triple exhaust, the check-valve seating to prevent backflow from the triple exhaust toward the said exhausting means.

13. A recharging mechanism for automatic air-brake systems, comprising means establishing communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to permit fluid-pressure to pass from the auxilary reservoir to the triple exhaust, means for yieldingly seating said valve, the valve opening automatically when a predetermined pressure has been introduced into the auxiliary reservoir, a check-valve located in said communication between the first-named valve and the triple exhaust and seating against the flow from the triple exhaust to the first-named valve, means for exhausting the pressure from the said communication at a point between the two valves, and means for automatically controlling an atmospheric vent from the triple exhaust.

14. A recharging mechanism for automatic air-brake systems, comprising means establishing communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to permit fluid-pressure to pass from the auxiliary reservoir to the triple exhaust, means for yieldingly seating said valve, the valve opening automatically when a predetermined pressure has been introduced into the auxiliary reservoir, a check-valve located in said communication between the first-named valve and the triple exhaust and seating against the flow from the triple exhaust to the first-named valve, means for exhausting the pressure from the said communication at a point between the two valves, and means for automatically controlling an atmospheric vent from the triple exhaust, the last-named means being actuated by the fluid-pressure in the said communication at a point between the two valves therein.

15. A recharging mechanism for automatic air-brake systems, comprising means establishing communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to permit fluid-pressure to pass from the auxiliary reservoir to the triple exhaust, means for yieldingly seating said valve, the valves opening automatically when a predetermined pressure has been introduced into the auxiliary reservoir, a check-valve located in said communication between the first-named valve and the triple exhaust and seating against the flow from the triple exhaust to the first-named valve, means for exhausting the pressure from the said communication at a point between the two valves, and means for automatically controlling an atmospheric vent from the triple exhaust, the said means for exhausting the pressure in the communication between the two valves including a connection between said communication and the train-line.

16. A recharging mechanism for automatic air-brake systems, comprising means establishing communication between the auxiliary reservoir and the triple exhaust, a valve commanding said communication and opening to permit fluid-pressure to pass from the auxiliary reservoir to the triple exhaust, means for yieldingly seating said valve, the valve opening automatically when a predetermined pressure has been introduced into the auxiliary reservoir, a check-valve located in said communication between the first-named valve and the triple exhaust and seating against the flow from the triple exhaust to the first-named valve, means for exhausting the pressure from the said communication at a point between the two valves, and means for automatically controlling an atmospheric vent from the triple exhaust, the said means for exhausting the pressure in the communication between the two valves thereof comprising a connection between said communication and the train-line, a valve commanding an atmospheric vent and a connection between the last-named and first-named valves for the purpose specified.

17. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve controlling said means, means for yieldingly seating the valve, the valve opening under the action of a predetermined pressure in the auxiliary reservoir to admit pressure from the reservoir to the triple exhaust, a check-valve located in said communication between the first-named valve and the triple exhaust

and seating against the flow from the triple exhaust, means for exhausting the pressure in the said communication between the two valves, and means commanding an atmospheric vent from the triple exhaust.

18. A recharging mechanism for automatic air-brake systems, comprising means establishing a communication between the auxiliary reservoir and the triple exhaust, a valve controlling said means, means for yieldingly seating the valve, the valve opening under the action of a predetermined pressure in the auxiliary reservoir to admit pressure from the reservoir to the triple exhaust, a check-valve located in said communication between the first-named valve and the triple exhaust and seating against the flow from the triple exhaust, means for exhausting the pressure in the said communication between the two valves, and means commanding an atmospheric vent from the triple exhaust, said means being operative by fluid-pressure, and communicating with the said communication between the auxiliary reservoir and the triple exhaust at a point between the two valves in said communication.

19. An air-brake attachment comprising a casing having a passage therethrough, also having two vents communicating with said passage, a valve commanding the passage and located intermediate the vents, a valve commanding each vent, a diaphragm adapted to actuate one vent-valve, a second valve commanding the said passage, a spring pressing the second valve to its seat, and a connection between the said valve and the valve of the second or remaining vent.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEZEKIAH MINNICK.

Witnesses:

L. G. MINNICK,

G. C. MCLANE.