(No Model.) 3 Sheets—Sheet 1.

J. E. MAYNADIER.

QUICK ACTION TRIPLE VALVE.

No. 540,360. Patented June 4, 1895.

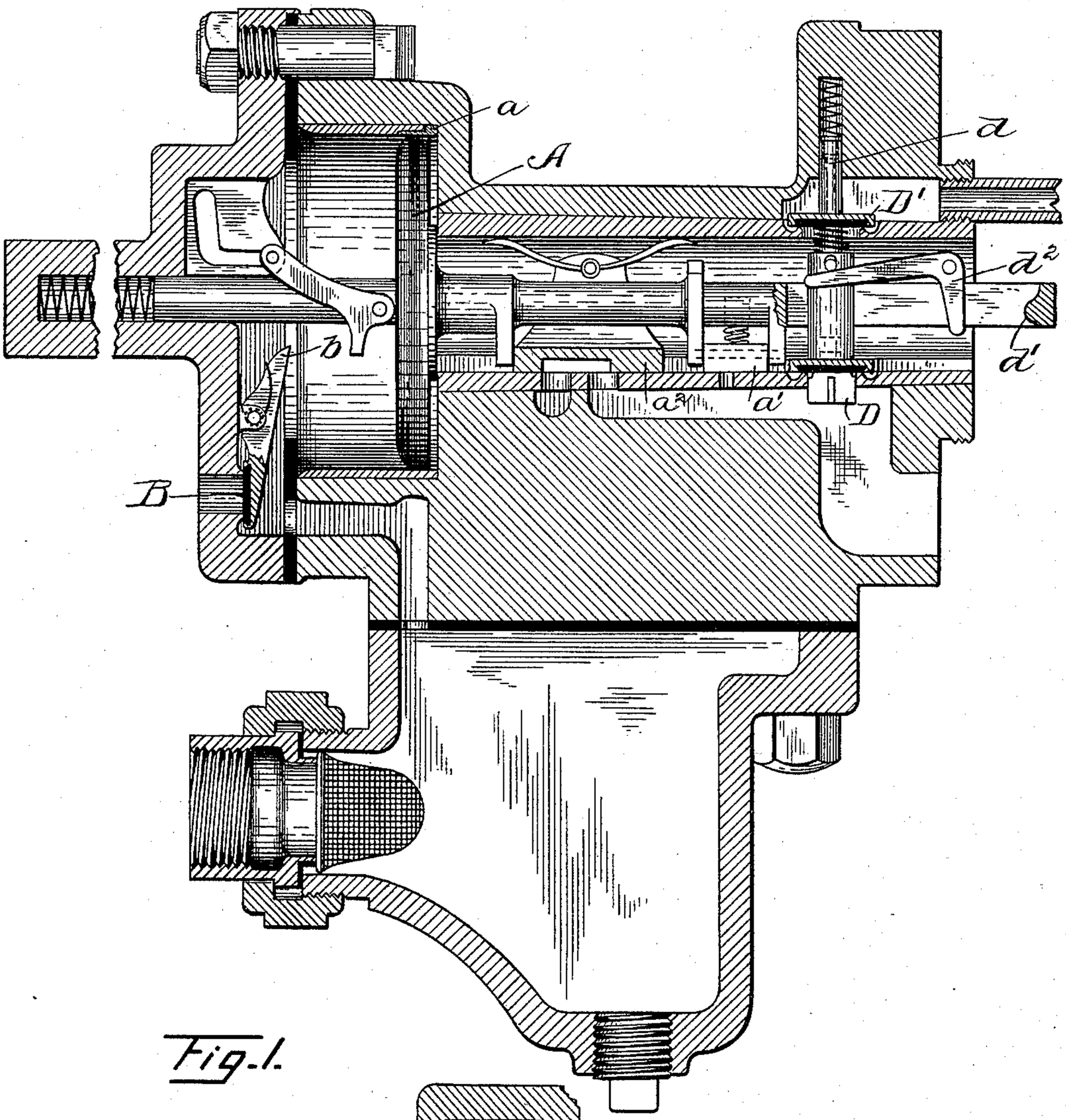

Fig. 1.

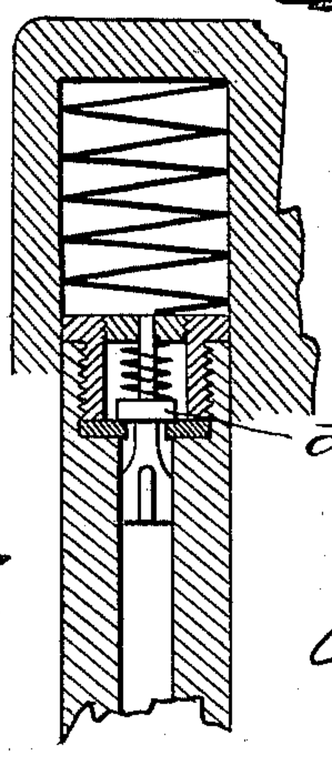

Fig. 3.

Witnesses;
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John A. Brown.

Inventor;
James Eudette Maynadier

(No Model.) 3 Sheets—Sheet 2.

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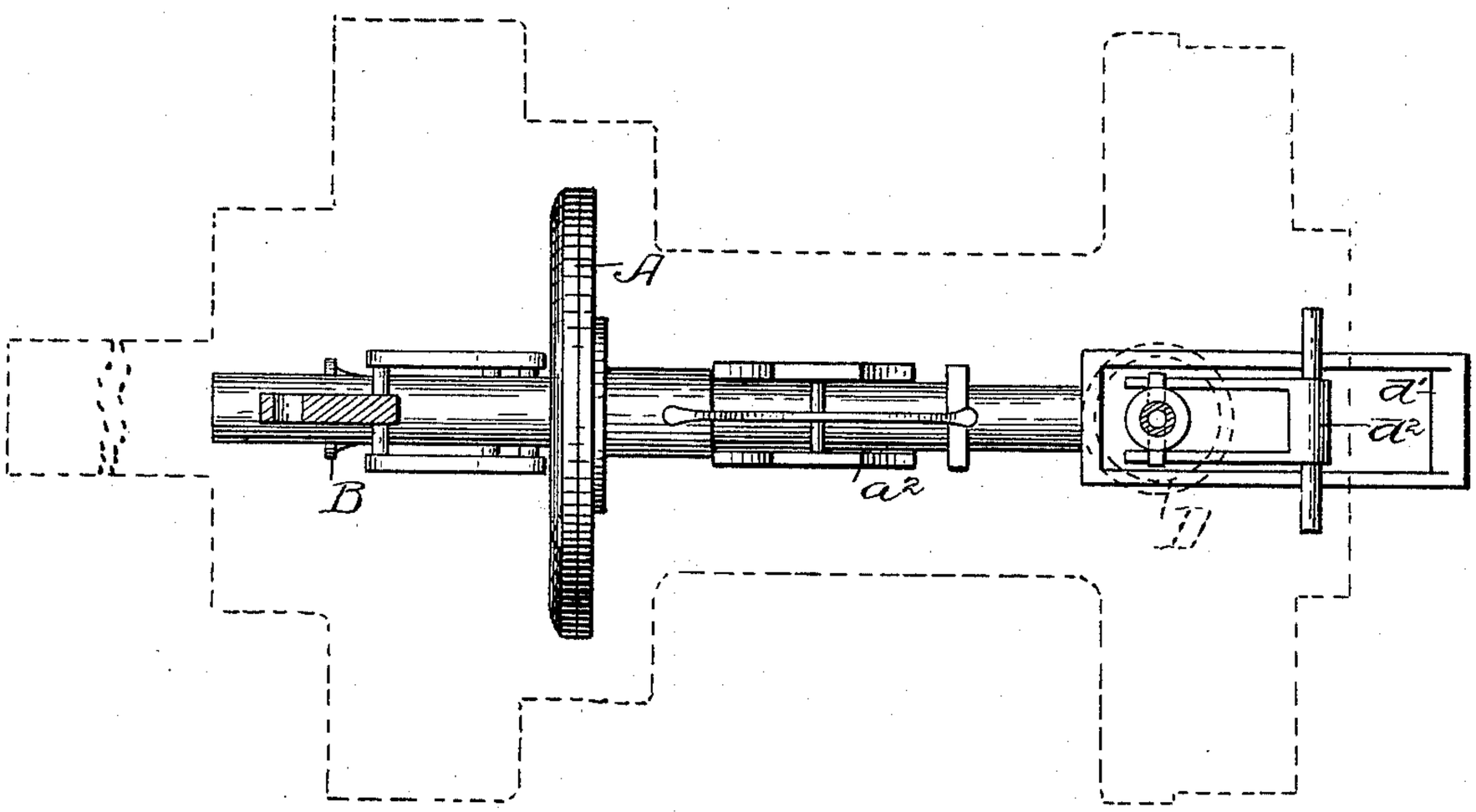

Fig. 2.

Witnesses;
Jonathan Bailey
John R. Snow.

Inventor;
James Eudette Maynadier

(No Model.) 3 Sheets—Sheet 3.

J. E. MAYNADIER.

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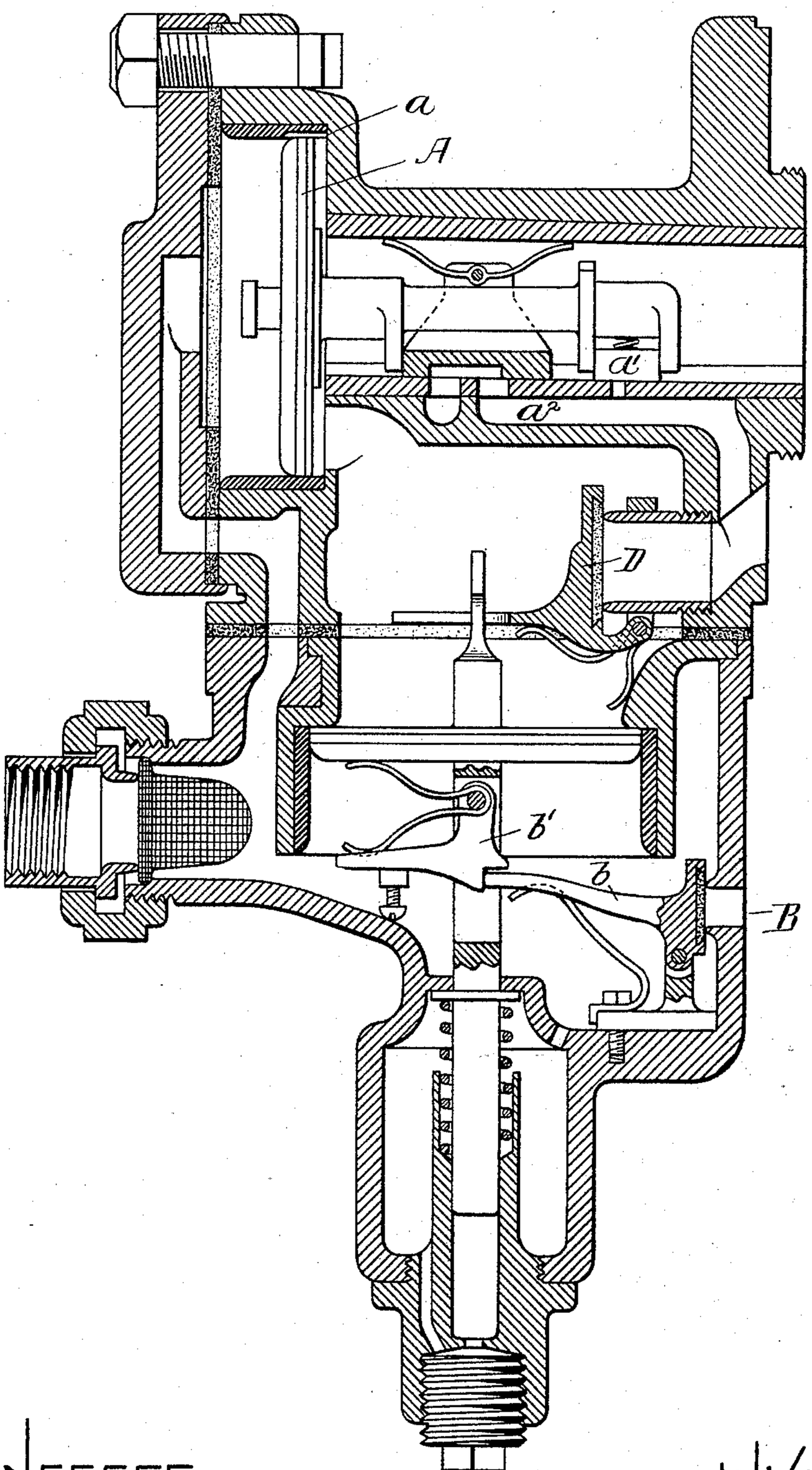

Fig. 4.

WITNESSES.
William Maynadier
John R. Snow

INVENTOR
James Everett Maynadier.

UNITED STATES PATENT OFFICE.

JAMES EVELETH MAYNADIER, OF TAUNTON, MASSACHUSETTS.

QUICK-ACTION TRIPLE VALVE.

SPECIFICATION forming part of Letters Patent No. 540,360, dated June 4, 1895.

Application filed May 28, 1894. Serial No. 512,614. (No model.)

To all whom it may concern:

Be it known that I, JAMES EVELETH MAYNADIER, of Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Quick-Action Triple Valve, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation, and Fig. 2 a plan, of the working parts. Fig. 3 is a sectional detail. Fig. 4 is a modification.

My invention is a quick action automatic brake system, made up of what has long been known as a triple valve, combined with an auxiliary valve device opened only on a greater than normal reduction of pressure in the train pipe and controlling a port for venting the train pipe to the atmosphere, hereinafter called the vent valve, and an emergency valve for opening an ample port through which compressed air from a reservoir can flow rapidly into the brake cylinder; all so organized that service stops and graduation will be effected on normal reductions of train pipe pressure, as heretofore, but the train pipe will be automatically vented to the atmosphere and a large emergency port from reservoir to brake cylinder will be automatically opened on greater than normal reduction of train pipe pressure.

The triple valve consists of the piston A, with its charging port a, and the graduation and exhaust valves a' a^2, all too well known to require description; and on the partial stroke of piston A for service stops and graduation the operation is the familiar one; but on a sudden or great reduction of pressure in the brake pipe the piston A makes its extreme stroke, and opens for a moment the vent valve B, through which air flows from the train pipe to the atmosphere with the effect of rapidly reducing the pressure in the train pipe. This extreme stroke of piston A also opens an emergency valve D, by which air is admitted rapidly into the brake cylinder; the full result being that the brakes under each car are applied with great force, and on all the cars in a long train within a few seconds after the engineer opens his valve for an emergency stop.

The main advantages of my system are that by making the vent valves of proper area the application of the brakes of successive cars of a long train can be made so rapidly that the brakes will be felt on the rear cars of the train within a second or two after they are applied on the front cars, and this notwithstanding an extra reservoir be used to augment the braking force, which is in itself a practical advantage.

I have shown the vent valve B as controlled by a latch b' on the front stem of the triple valve piston A, which snaps past the arm b as the vent valve is raised, thus allowing valve B to close when piston A reaches the end of its extreme stroke; and this vent to the atmosphere, is one feature of novelty of my invention; for the control of the emergency valve D by the piston A is much the same as the control of the graduation valve a', by that piston, the main difference being that valve D opens a port altogether larger than would be practical for valve a'.

So far I have described my invention as used with the usual auxiliary reservoir which is a necessary part of the well known automatic brake system; but in order to get a greater braking force I use an extra auxiliary reservoir which opens on the reservoir side of piston A, but is kept closed by a valve D′ which is opened only when valve D is to be opened; the two valves D and D′ being controlled by the extreme stroke of piston A, through lever d^2 and the cross piece d' on the stem of piston A. For greater certainty I prefer to so proportion the parts that the piston A after its partial stroke and at the early part of its extreme stroke, shall first open the vent valve B, when air vents rapidly from the brake pipe through the port of valve B; and a slightly further movement of the piston A opens valve D′, and also valve D, thus making it certain that the pressure on the reservoir side of piston A is ample to compel it to complete its extreme stroke, when piston A holds both valves D and D′ open, but allows valve B to close. This venting of the air from the brake pipe to the atmosphere through valve B causes a sudden reduction of pressure in the brake pipe under the next car, and causes the piston A of that car to make its extreme stroke, with a like venting of air

from the brake pipe; and so on from car to car with great rapidity; for although I have expressed a preference for a certain order of opening the valves B D′ and D, yet it will not be understood that any large fraction of a second is required to open all three in the first car when the engineer opens his valve for an emergency stop. After all the valves D and D′ have thus opened under all the cars and the brakes are thus applied to all the cars the pressure in the brake pipe is restored in the usual manner and the piston A thus forced back to place, and the reservoirs are recharged through the charging port *a*, and through a check valve *d*, by which air can flow into the extra auxiliary reservoir when one is used. I prefer to place this charging valve *d* in the stem of the valve D′ as shown; but other means for charging this reservoir will be well understood without description.

A modification is shown in Fig. 4, where piston A has no excess stroke; and piston A′ operates only on a greater than normal reduction of pressure, and controls only one valve D whose port leads into the passage to the brake cylinder. As valve D is always exposed to pressure from the auxiliary reservoir, air will flow from that reservoir into the brake cylinder when valve D is opened by the movement of piston A′; for the operation of pstion A′, in Fig. 4, is strictly analogous to the operation of piston A on its excess stroke in the other figures, except that no provision is shown in Fig. 4, for a second auxiliary reservoir.

I disclaim the combination, in an air brake system, with train pipe, auxiliary reservoir, brake cylinder, triple valve, and a supplemental reservoir, of a valve controlling a passage between the auxiliary and supplemental reservoirs and a service piston in the triple valve adapted to make a short or a long stroke, said piston holding the valve between the two reservoirs closed on its short strokes but opening the valve on its long strokes.

What I claim as my invention is—

1. The combination of the following instrumentalities; viz. a train pipe; an auxiliary reservoir; a brake cylinder; a valve controlling the exhaust from the brake cylinder; a graduation valve for supplying reservoir pressure to the brake cylinder; a vent valve for venting train pipe pressure into the atmosphere; an emergency valve for supplying reservoir pressure to the brake cylinder; means actuated by normal reduction of train pipe pressure to control the exhaust and graduation valve; and means actuated by greater than normal reduction of train pipe pressure to open the emergency valve and to open the vent valve against a seating force and then relinquish control of the vent valve; all the parts being organized to produce the quick action brake system above described.

2. In combination a train pipe; two auxiliary reservoirs; a brake cylinder; a valve controlling the exhaust from the brake cylinder; a graduation valve for supplying reservoir pressure from one of the reservoirs to the brake cylinder; a vent valve for venting train pipe pressure into the atmosphere; an emergency valve for supplying reservoir pressure to the brake cylinder; a valve for opening the second reservoir to the first; means actuated by normal reductions of train pipe pressure for controlling the exhaust and graduation valves, and means actuated by a greater than normal reduction of train pipe pressure for opening the vent valve, the emergency valve and the valve connecting the reservoirs; all combined and operated substantially as described.

JAMES EVELETH MAYNADIER.

Witnesses:

JOHN R. SNOW,

JONATHAN CILLEY.