No. 687,247. Patented Nov. 26, 1901.

C. A. MARRDER.

VALVE.

(Application filed Mar. 22, 1898.)

(No Model.) 2 Sheets—Sheet 1.

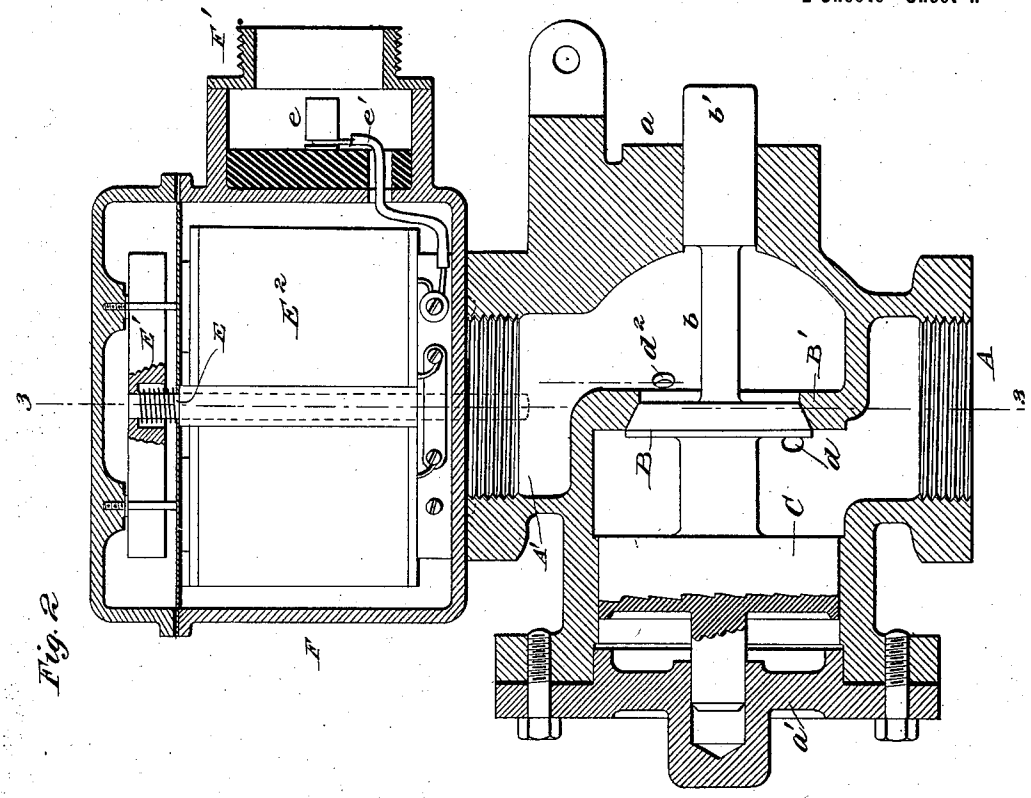


Fig. 2

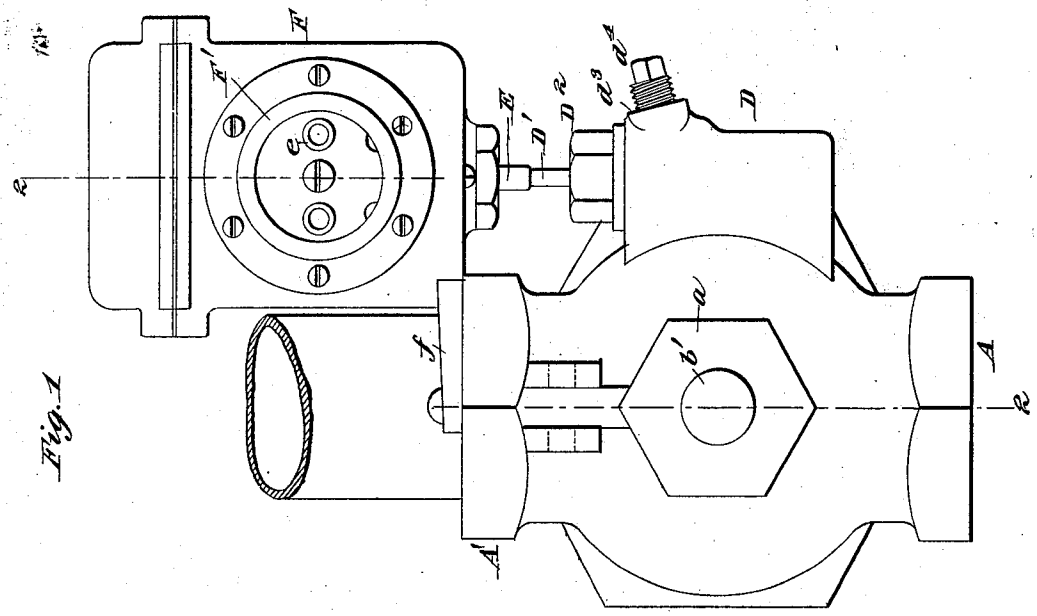


Fig. 1

Witnesses:

Jas. T. Coleman

W. Blyer

Inventor

Charles A. Marrder

by Richd. A. Byer

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 687,247. Patented Nov. 26, 1901.

C. A. MARRDER.

VALVE.

(Application filed Mar. 22, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4

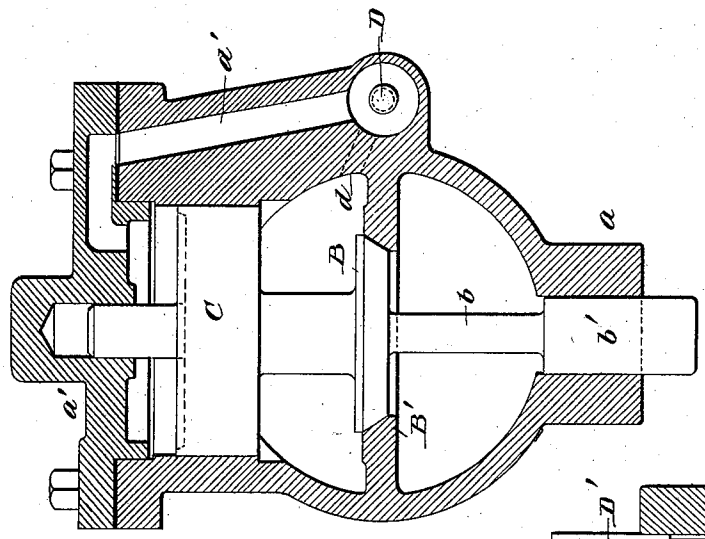


Fig. 5

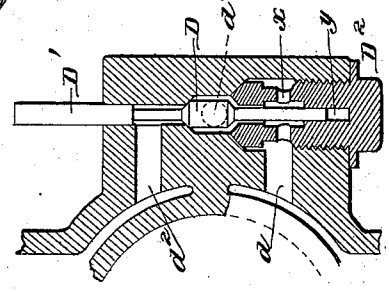
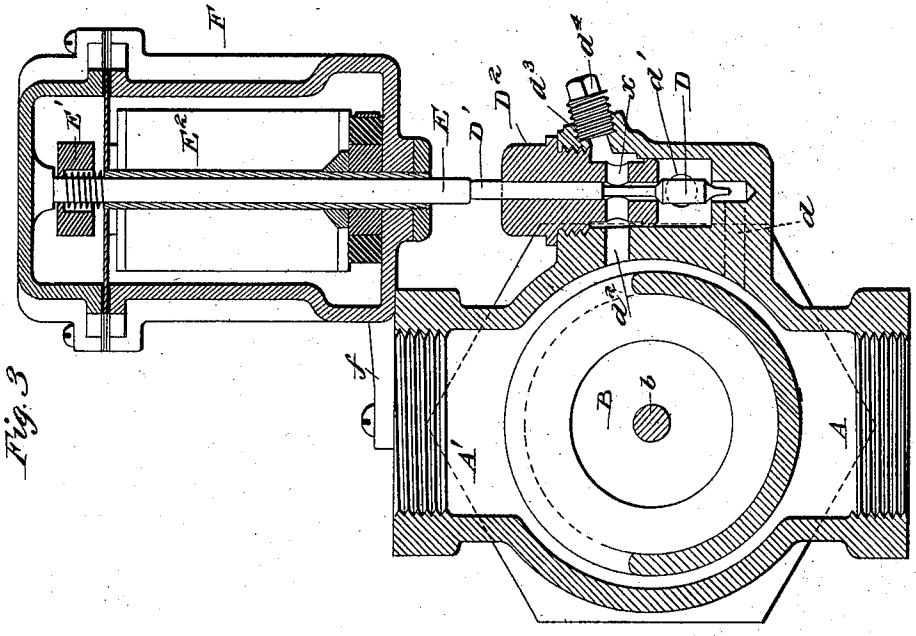


Fig. 3



Witnesses:

Jas. T. Coleman.

W. Bryer

Inventor

Charles A. Marrder

by Richd. N. Dyer

Atty.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES A. MARRDER, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SIGNAL AND CONTROL COMPANY, OF BOROUGH OF MANHATTAN, NEW YORK, N. Y., A CORPORATION OF WEST VIRGINIA.

VALVE.

SPECIFICATION forming part of Letters Patent No. 687,247, dated November 26, 1901.

Application filed March 22, 1898. Serial No. 674,846. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. MARRDER, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a certain new and useful Improvement in Valves, (Case A,) of which the following is a specification.

My invention relates to main valves controlled by auxiliary valves, and particularly to that class in which the auxiliary valve is electrically controlled or actuated; and my object is to produce a more compact and effective construction and to construct an auxiliary valve which will permit the operating-magnet being materially reduced in size, and thereby reduce the battery-power required. Heretofore the battery-power required to operate an effective form of auxiliary valve was quite large and the battery comprised a considerable number of cells. Where the valve is operated frequently in a short space of time, the battery-power runs down so rapidly that in a short time the current is insufficient to operate the magnet, and hence the apparatus is rendered inoperative. This is an important matter, particularly where the valve is employed for operating the whistle on ships, where the whistle is apt to be operated at short intervals during long periods, as in a fog.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation; Fig. 2, a vertical section on the line 2 2 of Fig. 1; Fig. 3, a vertical cross-section on the line 3 3 of Fig. 2; Fig. 4, a central horizontal section, and Fig. 5 a vertical section of a slight modification of the auxiliary valve shown in Fig. 3.

Referring to the drawings, A indicates the inlet side of the main valve, and A′ the outlet side.

B is the main valve, having a seat in the partition B′ and closing communication between the inlet and outlet sides. The valve B is carried by a stem b, having an enlarged end b' passing through the wall a, said end b' being adapted to be actuated by the ordinary form of hand-lever. The opposite end of the valve-stem has a bearing in a cap a'. In the chamber between the cap a' and the main valve B works the piston C, formed integrally with the valve-stem. The steam-pressure in the inlet side of the valve acts upon the right-hand side of the piston C and upon the valve B, and to balance the pressure upon the right-hand side of the piston C, I provide a port d, which communicates with the port d', leading to the left-hand side of the piston C. Thus the main valve is held to its seat by the pressure thereon. The passage of steam from the inlet side of the valve through the ports d and d' is controlled by the auxiliary valve D, which is normally held open by the pressure from the inlet side of the main valve. To open the main valve, the auxiliary valve D is shifted so as to cut off communication between the ports d and d' and establish communication between the port d' and the exhaust-port d^2, whereupon the pressure upon the left-hand side of the piston C is reduced, and the main valve becomes overbalanced by the pressure from the inlet side and is caused to open. The exhaust-port d^2 preferably opens into the outlet side of the main valve; but, if desired, the steam from the left-hand side of the piston C may be allowed to escape through the port d^3, in which case the plug d^4 will be removed. The valve D is formed at the lower end of the valve-stem D′, which projects upwardly through the plug D^2 and in line with the plunger E, carried by the armature E′ of magnet E^2. The plug D^2 is provided with a valve-seat and ports x, which communicate with the exhaust-ports d^2 or d^3. Magnet E^2 is contained in a water-tight casing F, having a screw-threaded extension F′ for receiving the coupling end of a cable carrying the conducting-wires and which coupling end will be provided with suitable terminals adapted to make contact with the terminals e and from which the wires e' extend through the casing F to suitable insulated binding-posts, to which the magnet-winding is connected. The magnet-casing F is provided with brackets f, by means of which the case is secured to the main valve.

In Fig. 5, which shows a modification of an auxiliary valve, it will be seen that the position of the parts is reversed, thus affording

a better bearing for the auxiliary-valve stem, and thereby insuring against the sticking of the valve. In this view, d is a port leading from the inlet side of the main valve, d' a port leading to the left-hand side of the piston C, and d^2 the exhaust-port leading to the outlet side of the main valve. The auxiliary valve D is formed at the middle of the valve-stem D', and the plug D^2 is screwed into the casing from the under side, and the lower end of the valve-stem is lengthened, so as to work in the bearing y in the plug D^2. In the position shown the auxiliary valve D is open—that is, ports d and d' are in communication—and the exhaust-port is closed.

What I claim is—

1. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port for said auxiliary-valve chamber, an auxiliary valve normally closing said exhaust-port, and means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port d, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

2. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port for said auxiliary-valve chamber, an auxiliary valve actuated by the pressure within the valve-chamber for normally closing said exhaust-port, and means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port d, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

3. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port connecting said auxiliary-valve chamber with the outlet side of the main-valve chamber, an auxiliary valve normally closing said exhaust-port, and means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port d, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

4. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port connecting said auxiliary-valve chamber with the outlet side of the main-valve chamber, an auxiliary valve actuated by the pressure within the valve-chamber for normally closing said exhaust-port, and means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port d, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

5. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port for said auxiliary-valve chamber, an auxiliary valve normally closing said exhaust-port, and electrically-operated means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port d, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

6. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port for said auxiliary-valve chamber, an auxiliary valve actuated by the pressure within the valve-chamber for normally closing said exhaust-port, and electrically-operated means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port d, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

7. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port d between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port connecting said auxiliary-valve chamber with the outlet side of the main-valve chamber, an

auxiliary valve normally closing said exhaust-port, and electrically-operated means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port *d*, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

8. The combination with a main valve normally held to its seat by direct pressure from the inlet side of the main-valve chamber, of a balanced piston mounted upon the valve-stem, an auxiliary-valve chamber, a normally open inlet-port *d* between said chamber and the inlet side of the main valve, an open port between said chamber and the chamber at the rear side of said piston, an exhaust-port connecting said auxiliary-valve chamber with the outlet side of the main-valve chamber, an auxiliary valve actuated by the pressure within the valve-chamber for normally closing said exhaust-port, and electrically-operated means for moving said valve to open said exhaust-port and for simultaneously closing inlet-port *d*, whereby the pressure from the inlet side of the main valve overbalances said piston and effects the opening of the main valve.

This specification signed and witnessed this 24th day of December, 1897.

CHARLES A. MARRDER.

Witnesses:

W. PELZER,

JOHN J. AYLWARD.