

No. 632,223.

Patented Aug. 29, 1899.

C. A. MARRDER.  
VALVE.

(Application filed Mar. 22, 1898.)

(No Model.)

Fig. 2

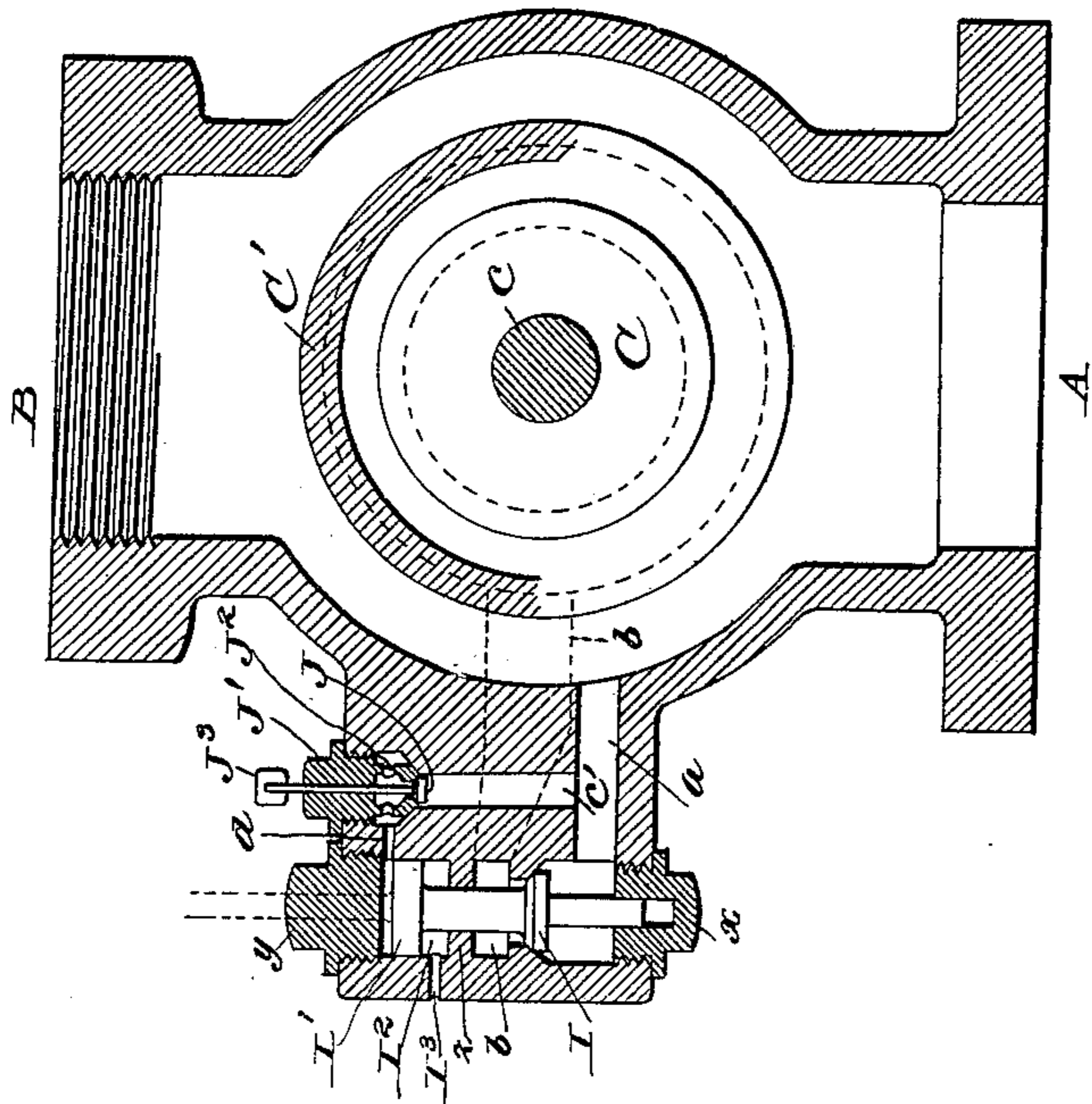
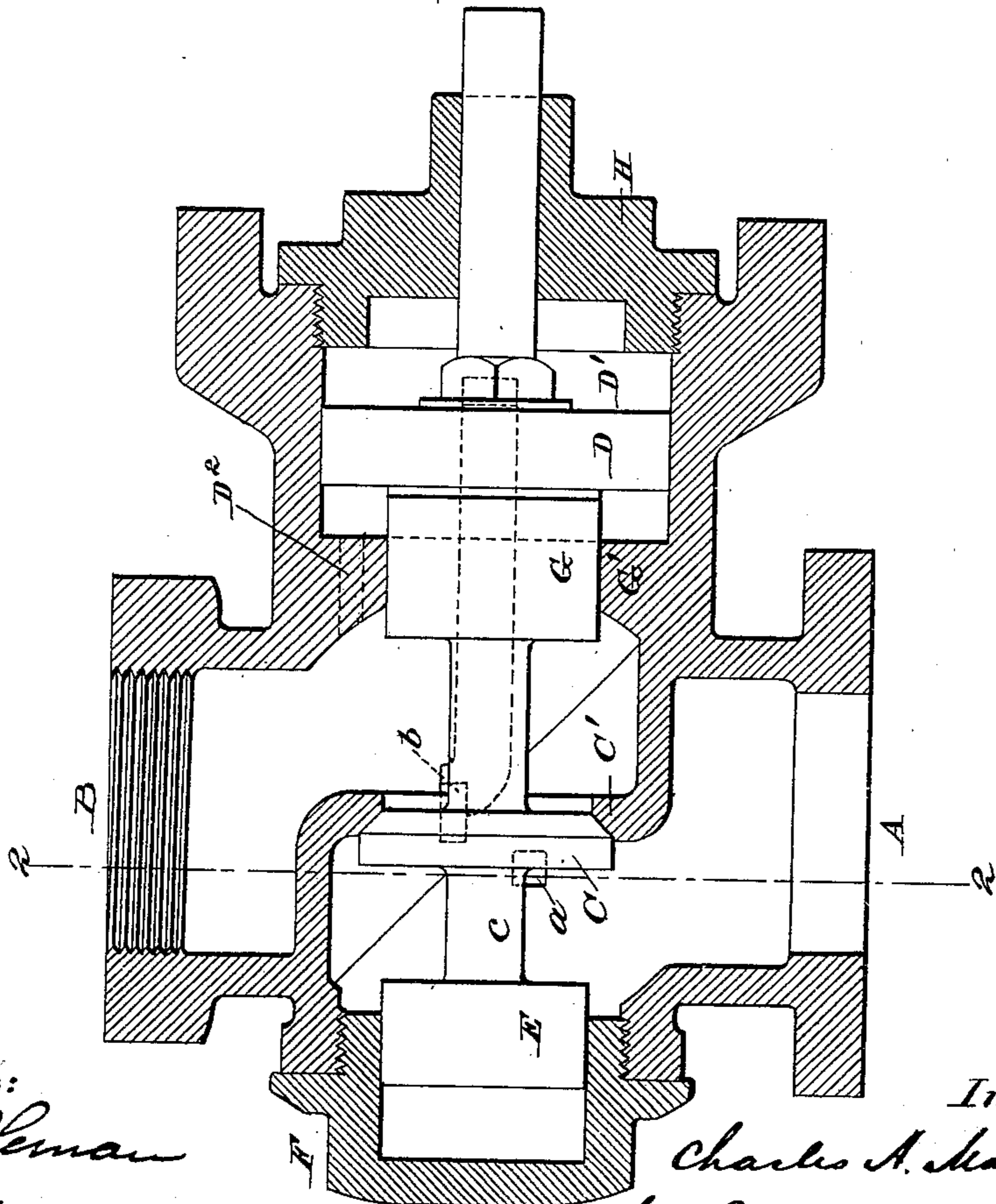


Fig. 1



Witnesses:

Jas. F. Coleman  
W. P. Meyer

Inventor

Charles A. Marrder  
by Richd. H. Dyer  
Att'y.

# UNITED STATES PATENT OFFICE.

CHARLES A. MARRDER, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE SIGNAL AND CONTROL COMPANY, OF SAME PLACE.

## VALVE.

SPECIFICATION forming part of Letters Patent No. 632,223, dated August 29, 1899.

Application filed March 22, 1898. Serial No. 674,847. (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 B,) of which the following is a specification.

My invention relates to valves in which the operation of a main valve is controlled by an auxiliary valve; and the object of my invention is mainly to improve the auxiliary valve, and particularly my object is to improve the construction of valve shown in the application of Arthur E. Colgate, filed September 19, 1896, Serial No. 606,313.

In carrying my invention into effect I employ a main valve which is held to its seat by the pressure from the inlet and which is opened by the pressure from the inlet actuating a piston working in a separate chamber and carried at one end of the valve-stem. The other end of the valve-stem is provided with a piston which works in a chamber to cushion the opening stroke of the valve. The passage from the inlet to the chamber containing the valve-actuating piston is controlled by an auxiliary or intermediate valve, which is held to its seat by pressure from the inlet side of the main valve, and this auxiliary valve I control by a second auxiliary valve, the latter being adapted to be operated by an electromagnet or other means. The main valve is also adapted to be operated manually by the ordinary pivoted lever in case of a breakdown in auxiliary apparatus. The operation of the main valve manually requires a very strong pull, and to facilitate its operation a long lever is usually employed. This objection may be overcome by operating the intermediate valve manually. That valve can be operated by a very slight pull, and for this purpose a small operating-lever may be employed.

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

Figure 1 is a vertical central section of the main valve, and Fig. 2 is a vertical cross-section on the line 2 2 of Fig. 1, showing the two auxiliary controlling-valves in central section.

Referring to the drawings, A is the inlet

side of the main valve, B the outlet side, and C the main valve, having a seat formed in the partition C'. The main valve C is carried by a stem c, having an actuating-piston D, working in a chamber D', and at the opposite end of the valve-stem is a piston E, working in a chamber formed in the cap F to cushion the opening stroke of the valve. The valve-stem is also provided with a cylindrical portion G between the valve-head C and the piston D, and this cylindrical portion works in a bearing formed in the partition G' to guide the main valve. The right-hand end of the valve-stem passes through the cap H and is adapted to be actuated by an ordinary lever, as will be well understood. It will be also understood that the main valve is held to its seat by pressure from the inlet side and that the port to the chamber D' is normally closed by the auxiliary valve, so that no pressure will be upon the piston B.

The auxiliary controlling-valves comprise the valve I and the valve J. The valve I controls the passage of steam from the inlet side of the main valve through the port a and the port b, which leads to the chamber D' and opens into the chamber at the right-hand side of piston D. To relieve the pressure upon the left-hand side of piston D, due to steam leaking around the piston, I provide a port D<sup>2</sup>, which leads from chamber D' to the outlet side of the main valve. The pressure from the inlet side of the main valve normally holds the valve I to its seat. This valve is carried by a stem whose lower end works in a bearing formed in the plug x, and the opposite end of this stem is provided with a head I', which works in the chamber I<sup>2</sup>, closed at the top by a plug y. The portion of the valve-stem between the piston I' and the valve I works in a bearing formed by the partition z, which partition also serves to form the chamber I<sup>2</sup>. To operate the auxiliary valve I, steam must be admitted to the upper side of the piston I', the area of which is greater than that of the valve I, whereby the steam-pressure upon the piston will open the valve I against the pressure from the inlet side of the main valve. The passage of steam to the upper side of the piston I' is controlled by the

valve J. This valve controls the passage of steam from the port *a* through the port *c'* and the port *d* to the upper side of the piston I'. Valve J is quite small and works in a plug J',  
 5 having a valve-seat and a small chamber provided with lateral openings J<sup>2</sup>, through which the steam passes to the port *d* when the valve J is opened. The stem of the valve J passes through the plug and is provided with a head  
 10 J<sup>3</sup>, with which the actuating device engages. The chamber I<sup>2</sup> is provided with a vent I<sup>3</sup> to relieve the pressure upon the under side of the piston I'.

With the auxiliary valve J any form of actuating device may be employed; but this valve is mainly designed to be operated by an electromagnet, and the object of employing this valve is to greatly reduce the battery power required in operating the valve.

20 In large valves of the type shown in the application above referred to a large number of cells are required to operate the magnet; but with the arrangement herein described I am enabled to control two-inch valves employed  
 25 with a steam-pressure of one hundred pounds to the square inch or more by two cells, while heretofore as many as fourteen cells were necessary.

As above stated, the auxiliary or intermediate valve I may be operated manually instead of operating the main valve manually. In that case the valve-stem of the main valve will not project through the cap H, and the stem of valve I will project through plug *y*,  
 35 as shown in dotted lines in Fig. 2. A bracket (not shown) will be secured to the side of the auxiliary valve-casing, upon which will be pivoted a small lever in position to operate upon the upper end of the stem of the intermediate valve I.  
 40

It will be understood, of course, that my improved auxiliary valve may be employed with any form of main valve, the form shown being used mainly as an illustration of one  
 45 application of my invention.

What I claim is—

1. The combination with a main valve held to its seat by pressure from the inlet side of the valve, of an intermediate valve for controlling the main valve, and a valve for con-  
 50 trolling said intermediate valve, substantially

as set forth.

2. The combination with a main valve held to its seat by pressure from the inlet side of the main valve, a piston connected with said  
 55 valve and working in a chamber communicating with the inlet side of the main valve, an intermediate valve for controlling the passage of fluid from the inlet side of the main valve to said chamber, and a valve for controlling said intermediate valve, substantially  
 60 as set forth.

3. The combination with a main valve held to its seat by pressure from the inlet side of the main valve, of an intermediate valve for  
 65 controlling the main valve, said intermediate valve being held to its seat by pressure from the inlet side of the main valve, and a valve for controlling said intermediate valve, substantially as set forth.  
 70

4. The combination with a main valve held to its seat by pressure from the inlet side of the main valve, a piston connected with said  
 75 valve and working in a chamber communicating with the inlet side of the main valve, an intermediate valve for controlling the passage of fluid from the inlet side of the main valve to said chamber, said intermediate valve being held to its seat by pressure from the inlet side of the main valve, and a valve for  
 80 controlling said intermediate valve, substantially as set forth.

5. The combination of a main valve held to its seat by pressure from the inlet side, a piston connected with said valve and working in  
 85 a chamber communicating with the inlet side of the main valve, an intermediate valve for controlling the port leading to the said chamber, a piston for actuating said intermediate valve, and a valve for controlling the flow of  
 90 fluid from the inlet side of the main valve to the chamber of such last-named piston to operate the intermediate valve, substantially as set forth.

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

CHARLES A. MARRDER.

Witnesses:

W. PELZER,

JOHN J. AYLWARD.