

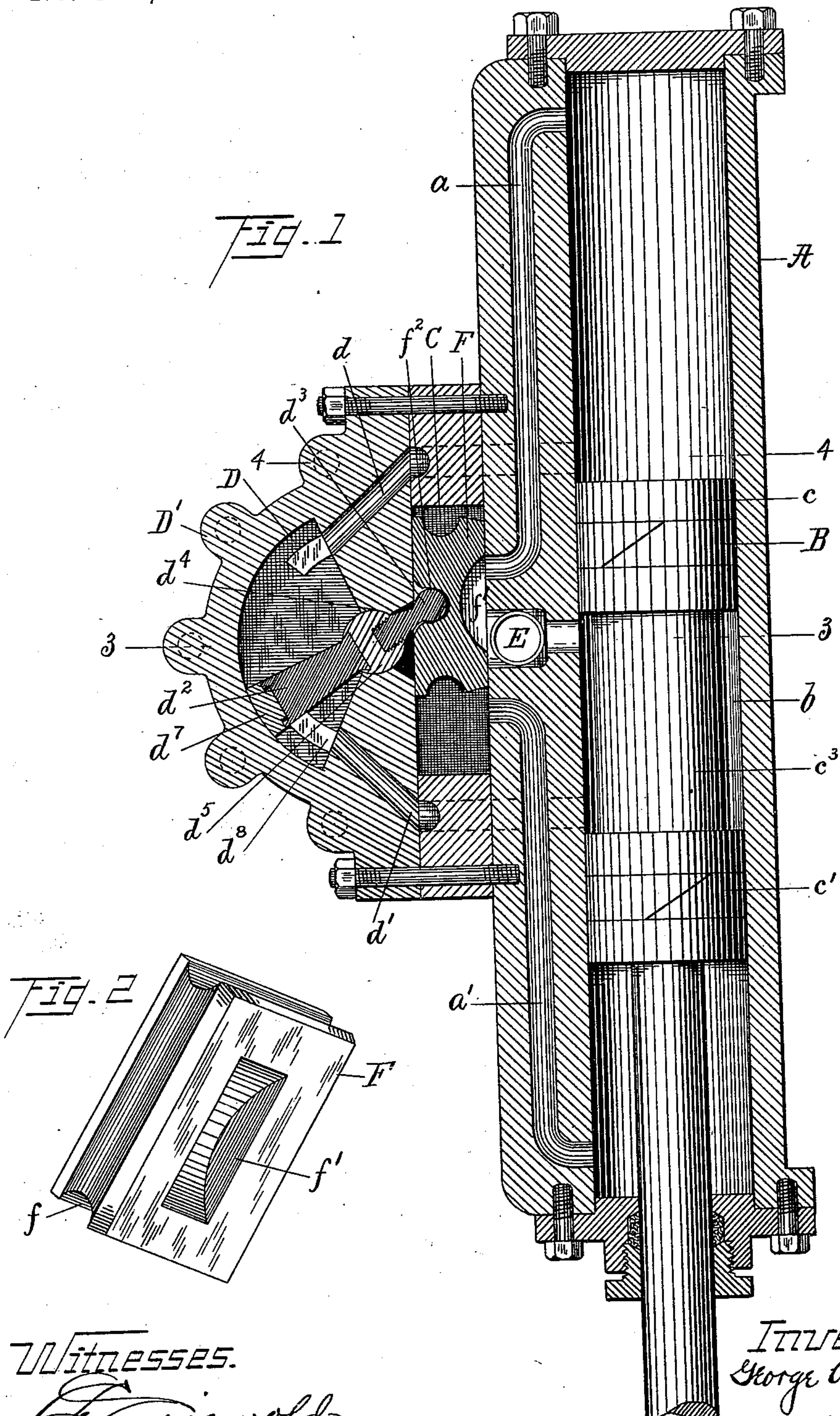
(No Model.)

2 Sheets—Sheet 1.

G. W. DRIGGS.
VALVE.

No. 561,096.

Patented June 2, 1896.



Witnesses.

L. Griswold.
Allen M. Wood.

Inventor.
George W. Driggs

By *Edwin L. Thurston*
his attorney

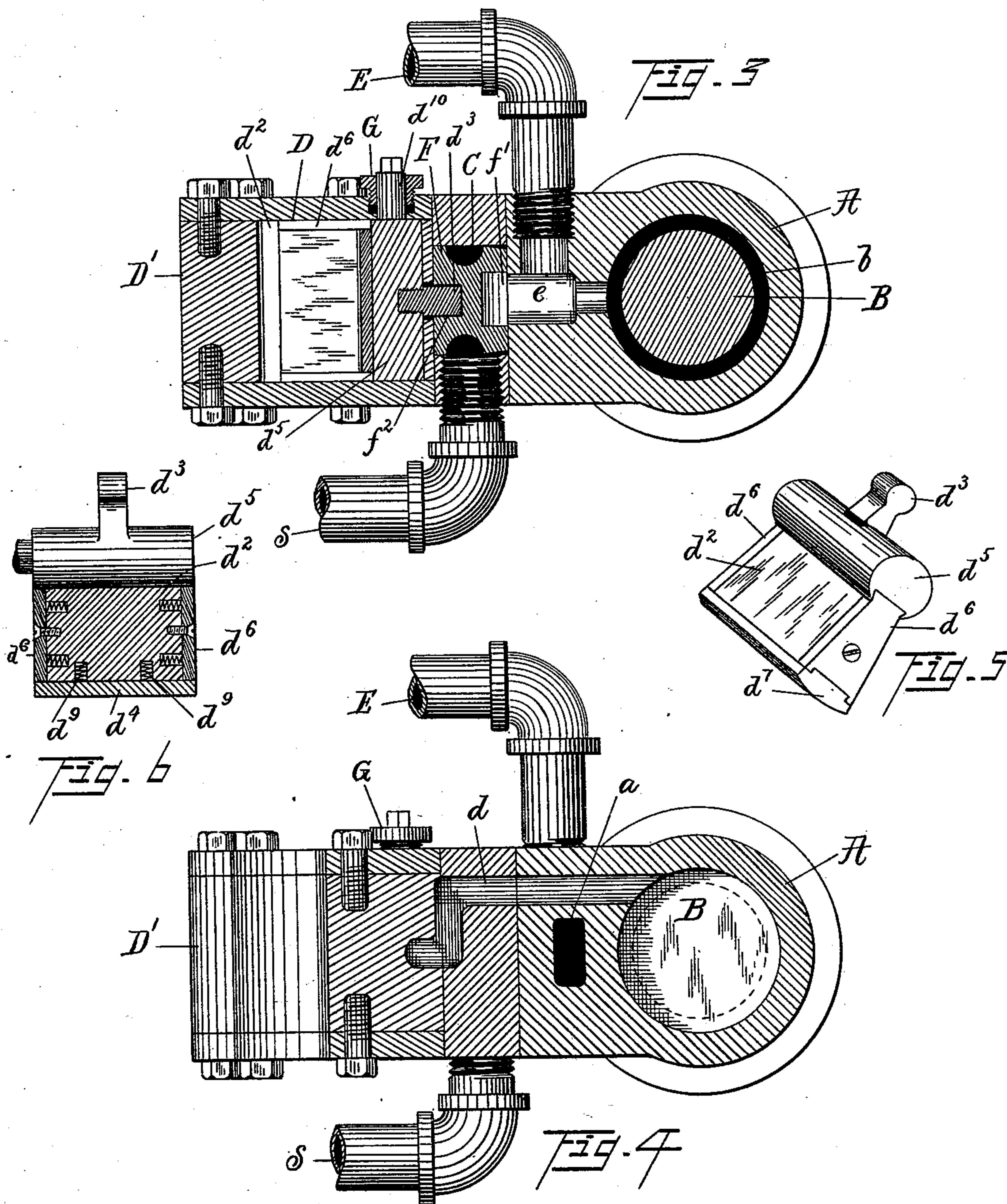
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UNITED STATES PATENT OFFICE.

GEORGE W. DRIGGS, OF ELYRIA, OHIO, ASSIGNOR OF ONE-HALF TO
MOSES BEAL, OF SAME PLACE.

VALVE.

SPECIFICATION forming part of Letters Patent No. 561,096, dated June 2, 1896.

Application filed February 13, 1895. Serial No. 538,283. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. DRIGGS, a citizen of the United States, residing at Elyria, in the county of Lorain and State of Ohio, have invented certain new and useful Improvements in Valves; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in slide-valves and mechanism for operating them, whereby steam is alternately directed into opposite ends of a steam-cylinder; and it consists in the construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a vertical longitudinal section of the cylinder and valve. Fig. 2 is a perspective view of the slide-valve. Fig. 3 is a sectional view on line 3 3 of Fig. 1. Fig. 4 is a sectional view on line 4 4 of Fig. 1. Fig. 5 is a perspective view of what I designate as the "flap;" and Fig. 6 is a partial sectional view of said flap, showing the springs for keeping the flap tight in its chamber.

Referring to the parts by letters, A represents the cylinder; B, the piston; C, the steam-chest, and D an independent chamber. Two ports a a' connect the steam-chest with opposite ends of the cylinder. Two other ports, d d' , connect the chamber D with the cylinder, the opening of said ports in the cylinder being at points where they will be covered and uncovered by the piston, as hereinafter described. The piston has two heads c c' , between which is an annular space b around the rod c^3 , to which both heads are connected.

The exhaust-pipe E is in open communication with a port e , which connects the cylinder and steam-chest.

In the steam-chest, which also acts as a valve-chamber, is fitted a slide-valve F, having grooves f in its sides, which permit the free passage of steam from one end of the steam-chest to the other. In the face of the valve adjacent to the cylinder is a cavity f' , which, as the valve is moved, connects the exhaust-port e with either port a or a' .

The independent chamber D is sector-cylinder shaped and is placed outside the steam-chest. In the wall which separates this valve-chamber from the steam-chest is a socket d^4 , concentric with the curved wall of the chamber, in which socket is fitted the cylindrical rib d^5 on the flap d^2 , which flap is fitted to and operates in said chamber. An arm d^3 projects from the cylindrical edge of the said flap into the steam-chest and enters a recess f^2 in the slide-valve. The primary function of this flap-valve is to move the slide, and said flap is moved in one direction or the other by the action of live steam, which passes from the cylinder to the chamber D through either of the ports d or d' .

The operation of the described construction will be understood from the following description and a reference to Fig. 1 of the drawings.

The piston, as shown, has just completed its downward movement, and the port d has just been uncovered by the piston-head c , whereby steam has begun to pass through said port from the cylinder into the chamber D. At the same time the piston-head c' uncovered the port d' , thereby connecting the chamber D with the annular space b between the piston-heads. As the steam enters the chamber D through port d it moves the flap d^2 over against the lug d^8 . In so moving the flap d^2 moves the slide-valve up so as to connect the upper end of the cylinder with the exhaust and to open the port a' for the passage of the live steam into the lower end of the cylinder, whereupon the piston moves upward until the two piston-heads pass the two ports d and d' , whereupon the action of all of the described parts is reversed. When the steam is exhausting from the upper end of the cylinder, it is likewise exhausting from the lower end of the chamber D, the steam passing through port d' into the annular space b between the piston-heads, and thence out through port e . The upper end of the chamber D is connected by port d with said space b when the piston is raised.

In order to take up all wear and keep the flap d^2 steam-tight in the chamber D, I prefer to construct said flap as follows: The shoe d^7 slides in a groove in the outer edge of the

flap, all wear being taken up by the springs d^9 d^9 . At each end of the flap are the spring-pressed plates d^6 d^6 , which bear against the side walls of the chamber D.

5 In order to provide means for reversing the movement of the piston, I form on the flap d^2 , concentric with its pivot, an arm d^{10} , which passes through a stuffing-box G in the wall of the chamber D, said arm outside of the
10 stuffing-box being so formed that a wrench-lever may be applied thereto. By means of this lever the flap d^2 may be moved, causing a corresponding movement of the slide-valve, thereby reversing the connection of the ports
15 a a' with the live steam and exhaust, respectively, with the result of reversing the movement of the piston. It is preferred that the steam shall be turned off when the flap d^2 is moved by the lever, as described; but after
20 said flap has been moved and the steam is again turned on the piston begins to move in the reverse direction to that in which it was moving when the steam was shut off, whatever may have been the position of the pis-
25 ton in the cylinder at that time.

Having described my invention, I claim—

1. The combination of the cylinder, a piston having two heads between which is an annular space, a sector-cylinder chamber, two
30 ports connecting opposite sides thereof with the cylinder, a steam-chest, two ports a a' connecting said steam-chest with the opposite ends of said cylinder, an open exhaust-port connecting said steam-chest and the annular
35 space in the cylinder between the piston-

heads, a balanced slide-valve in said steam-chest having in one side a cavity f' for alternately connecting the ports a and a' with the exhaust, and having also a recess f^2 , and an oscillating flap movable in the said sector-
40 cylinder chamber and pivoted concentric therewith, an arm, rigid with said flap and concentric with its pivot, which extends out through the wall of the valve-chamber D, and
45 an arm rigid with said flap which enters the recess f^2 in the slide, substantially as and for the purpose specified.

2. The combination of a steam-chest having two ports a and a' for the passage of steam to and from a cylinder, and an intermediate
50 exhaust-port, a slide-valve having in its sides grooves which extend from end to end, a cavity on one face for alternately connecting the ports a and a' with the exhaust, a sector-
55 cylinder chamber having ports in opposite ends adapted to alternately admit steam thereto and exhaust it therefrom, a flap fitted to said chamber and pivoted concentrically therewith, having on its outer edge and both
60 sides the spring-pressed plates d^7 d^6 , and an arm rigid with said flap, which enters the steam-chest and engages with the slide-valve, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. DRIGGS.

Witnesses:

MOSES BEAL,
E. L. THURSTON.