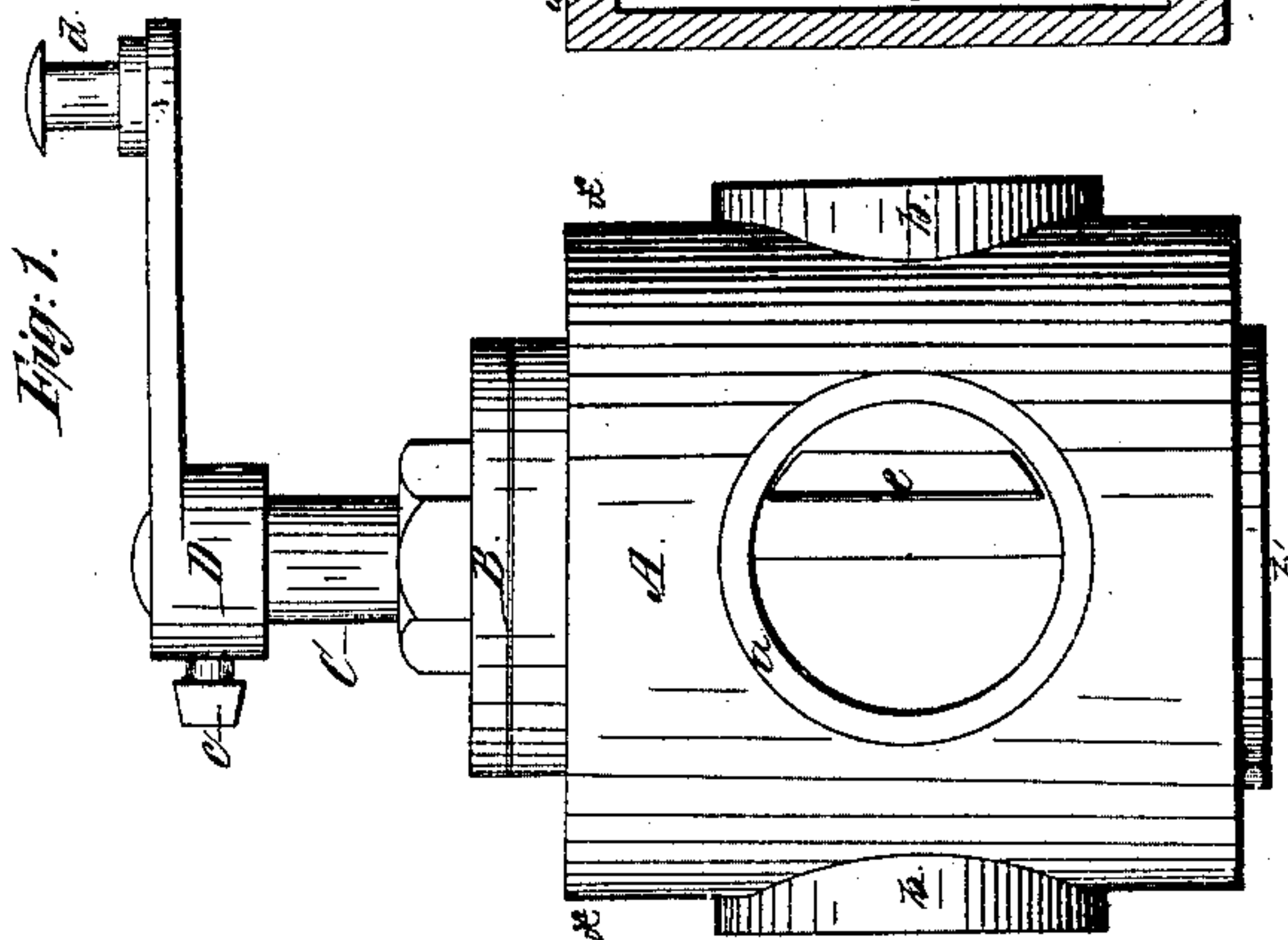
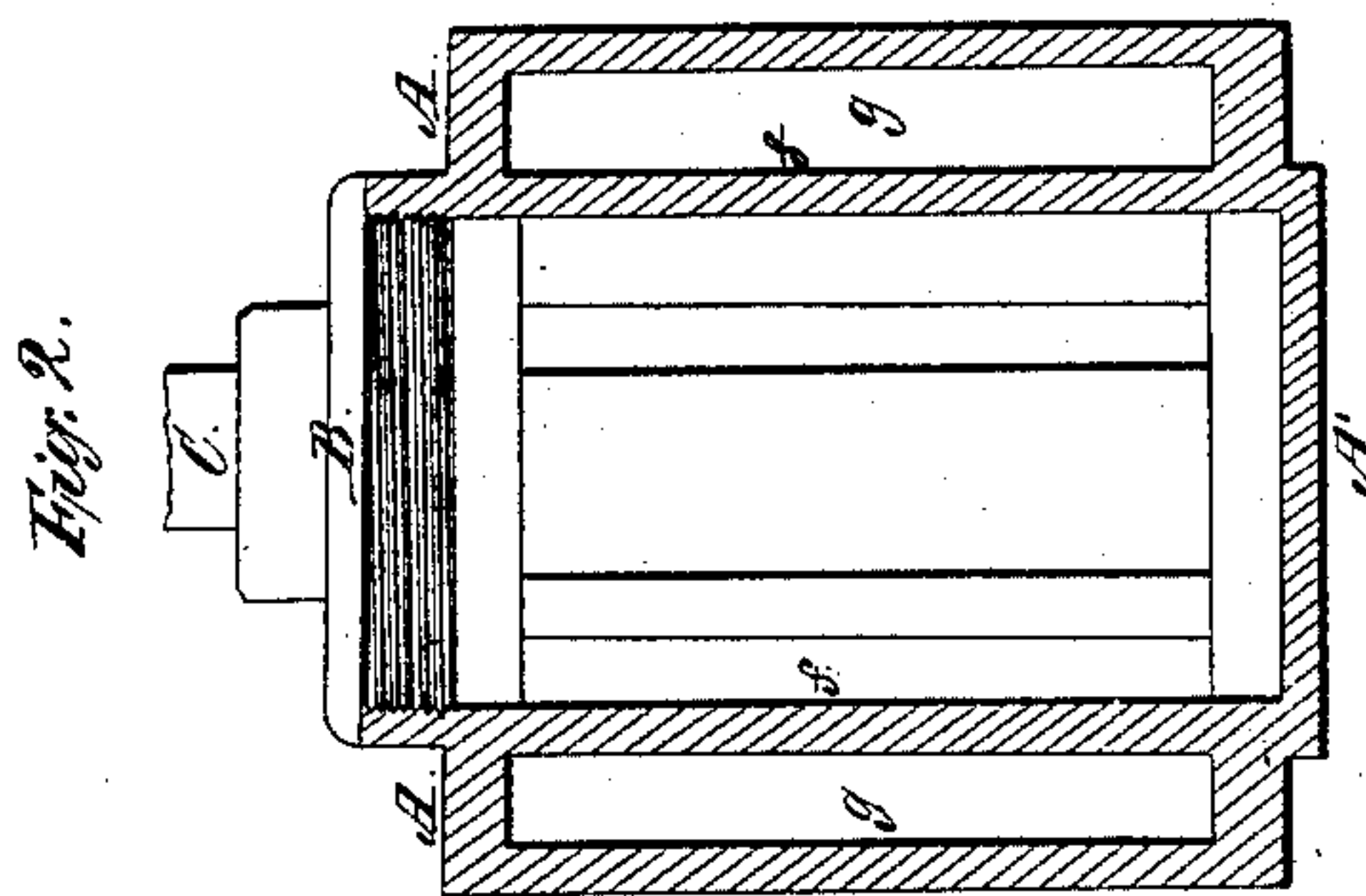
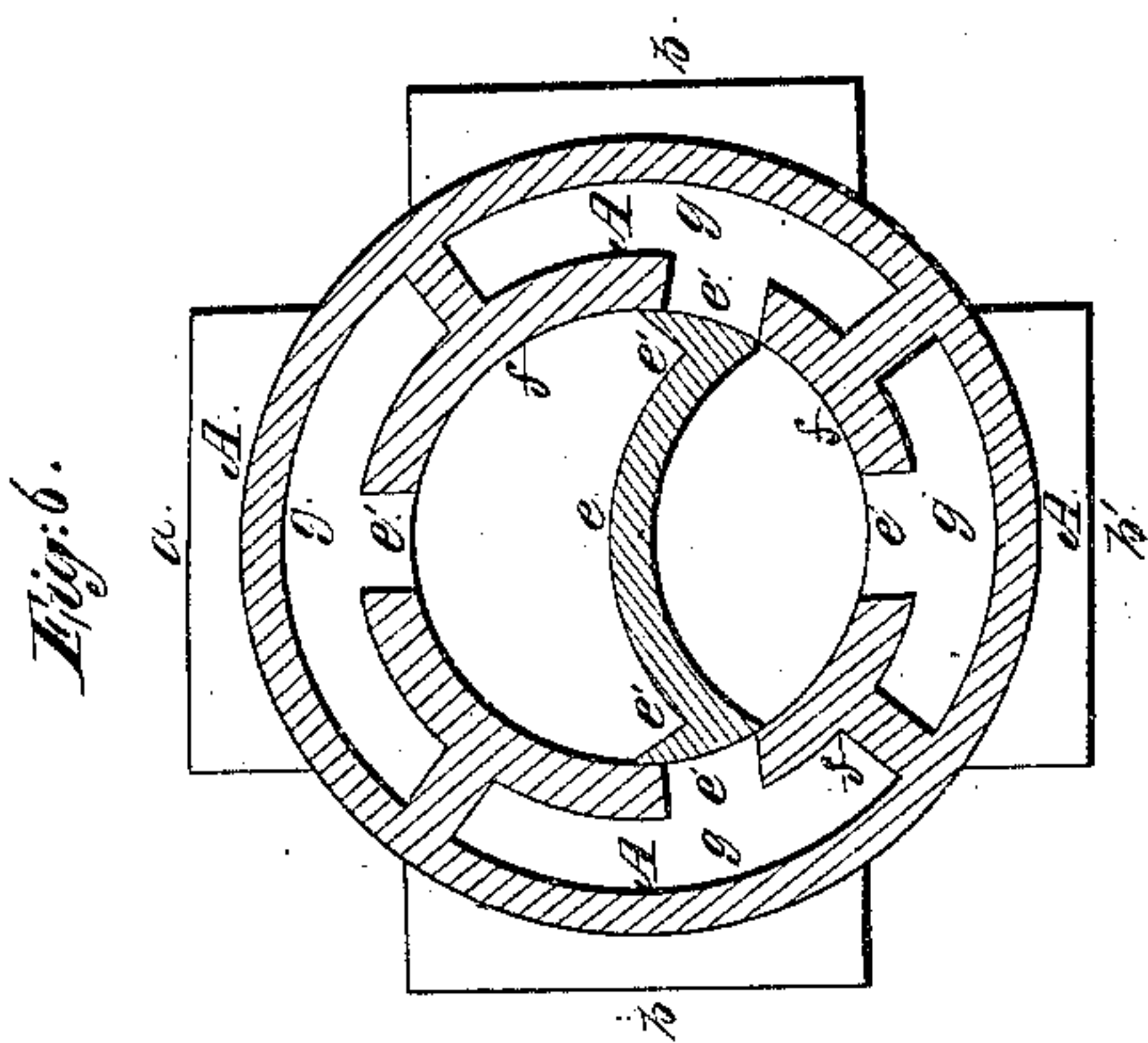
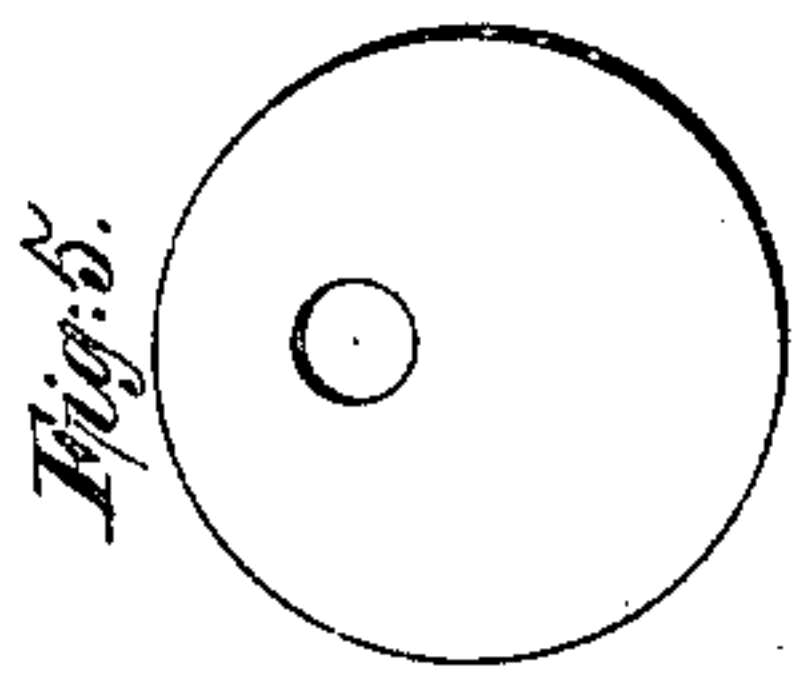
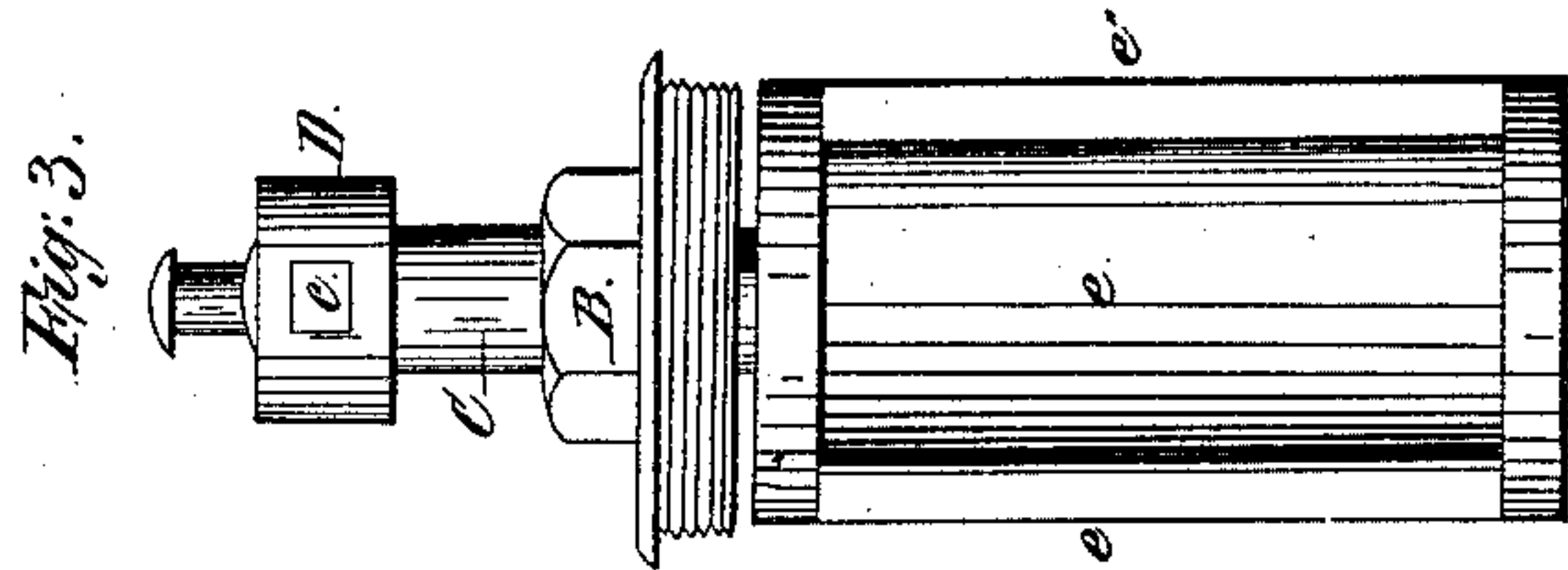
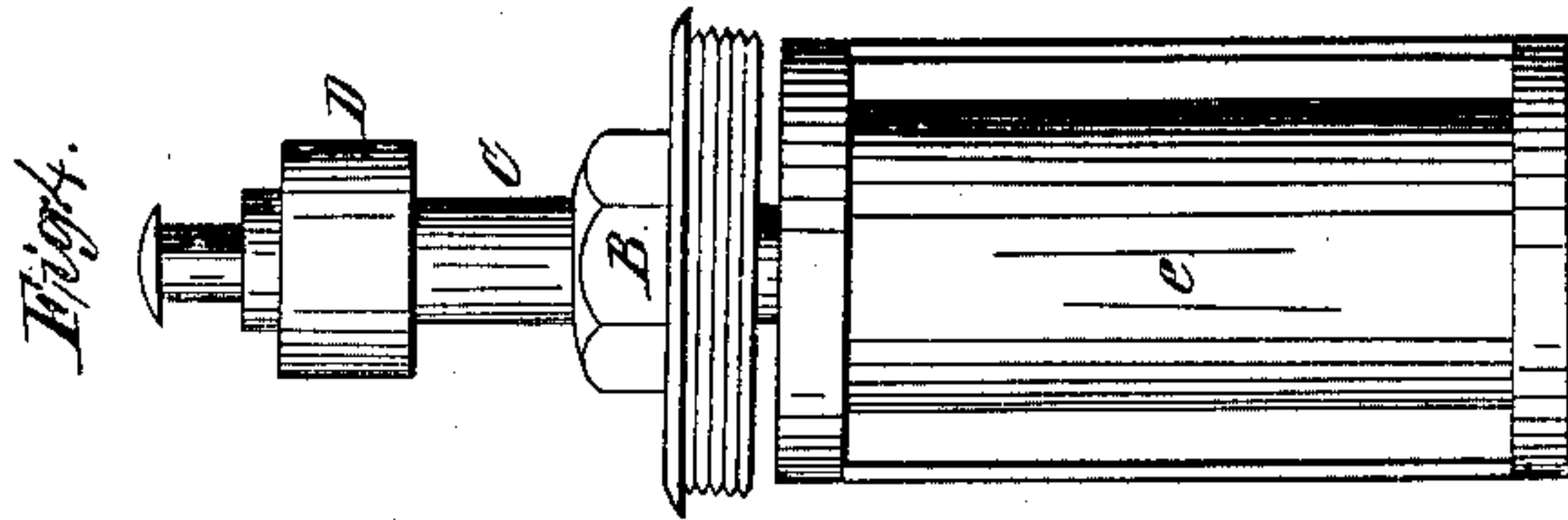


R. Stenart,
Rotary Steam Valve.

N^o 21,524.

Patented Sep. 14, 1858.



UNITED STATES PATENT OFFICE.

ROBT. STEWART, OF ELMIRA, NEW YORK.

COMBINATION STEAM-VALVE.

Specification of Letters Patent No. 21,524, dated September 14, 1858.

To all whom it may concern:

Be it known that I, ROBERT STEWART, of Elmira, in the county of Chemung and the State of New York, have invented certain
5 new and useful Improvements in Steam-Valves, to be known and used as "Stewart's Combination Steam-Valve;" and I do hereby declare that the following is a full and exact description thereof, reference being
10 had to the accompanying drawings and to the letters of reference marked thereon.

In the drawings—Figure 1, is a plan view. Fig. 2, is a vertical section. Fig. 3, is a section showing the valve without the shell,
15 with the bottom side up. Fig. 4, is a section of the same with top side removed. Fig. 5, is an end view of the valve showing a hole for the steam to pass through. Fig. 6, is a cross section of the valve and shell at (x)
20 (x) Fig. 1.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

The nature of my invention consists in
25 making one valve accomplish the four following operations, which, ordinarily require four valves, viz.,—It is a steam chest; it is, a graduating cut off; it is a regulating valve; and it is, a stop valve, or it is, either
30 of these as may be required.

In the construction of my invention—A is the outside shell; (a) the inlet to the valve; (b) the opening to and from the cylinder; B, the screw head or steam packing; C, the
35 shaft of valve; D, the crank; (c) screw for fastening the crank to shaft, (d) crank handle; (e) the valve seen through inlet (a); (f) the inner shell, the dark space shows the interior of the valve. In Fig. 2,
40 A, the outer shell, (f) the inner shell, (g) the chamber between the inner and outer shells; B, the screw head or steam packing; (e) the valve; C, the shaft of valve.

In Fig. 3, B, is the head or packing, C, the shaft, D, the crank, (c) the screw for fastening the crank; (e) the valve with
45 convex side up, e' the valve head. Fig. 4, is the same with the concave side up. Like letters refer to like parts. In Fig. 5, E, the head or lower end of valve; (h) hole in head for passage of steam. In Fig. 6, A, the
50 outer shell; (a) the steam inlet; (b) the outlet to cylinder; (b') the outlet by which the steam enters and escapes from the cylinder, (e) the valve; (e') the steam ports,
55 (f) the inner shell; (g) the steam space be-

tween the inner and outer shells for admitting the steam from a circular pipe into said chamber, and then into the valve port, the whole length of the port, which could
60 not be done without the steam chamber.

In the operation of my invention—the steam is let in at inlet (a) into the outer chamber, and then through the valve into the interior chamber, then out at outlet (b)
65 into the cylinder, and vice versa on the other side, thus alternately letting on and off the steam from the cylinder and then out at the outlet on the bottom of the valve making a "cut off" at each stroke. The valve it
70 will be seen, is placed below the center so that it will be self adjusting at all times, and will not wear away so as to let steam escape. It will be seen that, whatever may be the
75 amount of wear on the valve, a like amount will be on the shaft or bearing, so that the wear on both valve and shaft being equal, the valve will at all times be steam tight. The head or packing is formed by the head
80 B being screwed into the end of the outer shell thus forming a steam joint; between the head of the valve and the surface of the head B is a ground joint, and by means of an opening in the lower head of the valve
85 which admits the steam to the outer surface on one end, and at the same time against the inner side of the upper head of the valve, thus always keeping it up tight
90 against the head B. As the valve operates the ports are alternately opened and the steam passed into and out of the cylinders, through the chambers (g) and out at the outlet (b').

I avoid the use of a stuffing box, by means of the steamtight joint, formed by the steam
95 head B, and the head of the valve e. The shaft C passing through head B, need not be made steamtight, as no steam can escape through it, as it is outside of the steam tight joint. Therefore this bearing needs no
100 packing. By this arrangement it will be seen, that as the valve wears away, the shaft, or bearing wears equally away, and yet, by the pressure of the steam on the upper side of the valve, it will always be made to fit
105 to its seat, and always adjust itself. Further the steam by passing through hole h gets between the lower head e'' and the shell, which with the pressure of steam against the upper head, keeps the valve always pressed
110 up tight against the head B, thus rendering the escape of steam impossible, and a

stuffing box of no advantage, but it would be destructive to the operation of the valve, constructed on the principles on which it operates, to use packing would be to destroy
5 it. My valve in principle is so constructed that, the heads e'' are its bearings, the crank C is simply a means of reaching it, and is not its bearing, this crank fits loosely in the head B, therefore it is at all times
10 self adjusting, which it is impossible for a valve to be having a shaft or fixed center on which to oscillate.

Having thus fully described the construction, and operation of my invention, what

I claim as new, and desire to secure by Letters Patent, is,— 15

The valve e , with heads e'' as guides or bearings fitting in chambers g' , in combination with the outer chambers g , and steam head B against which valve e is pressed up
20 forming a steam joint, operating as a self adjusting valve; operating as described and for the purposes set forth.

ROBERT STEWART.

Witnesses:

T. G. CLAYTON,
JAS. CROGGON.