

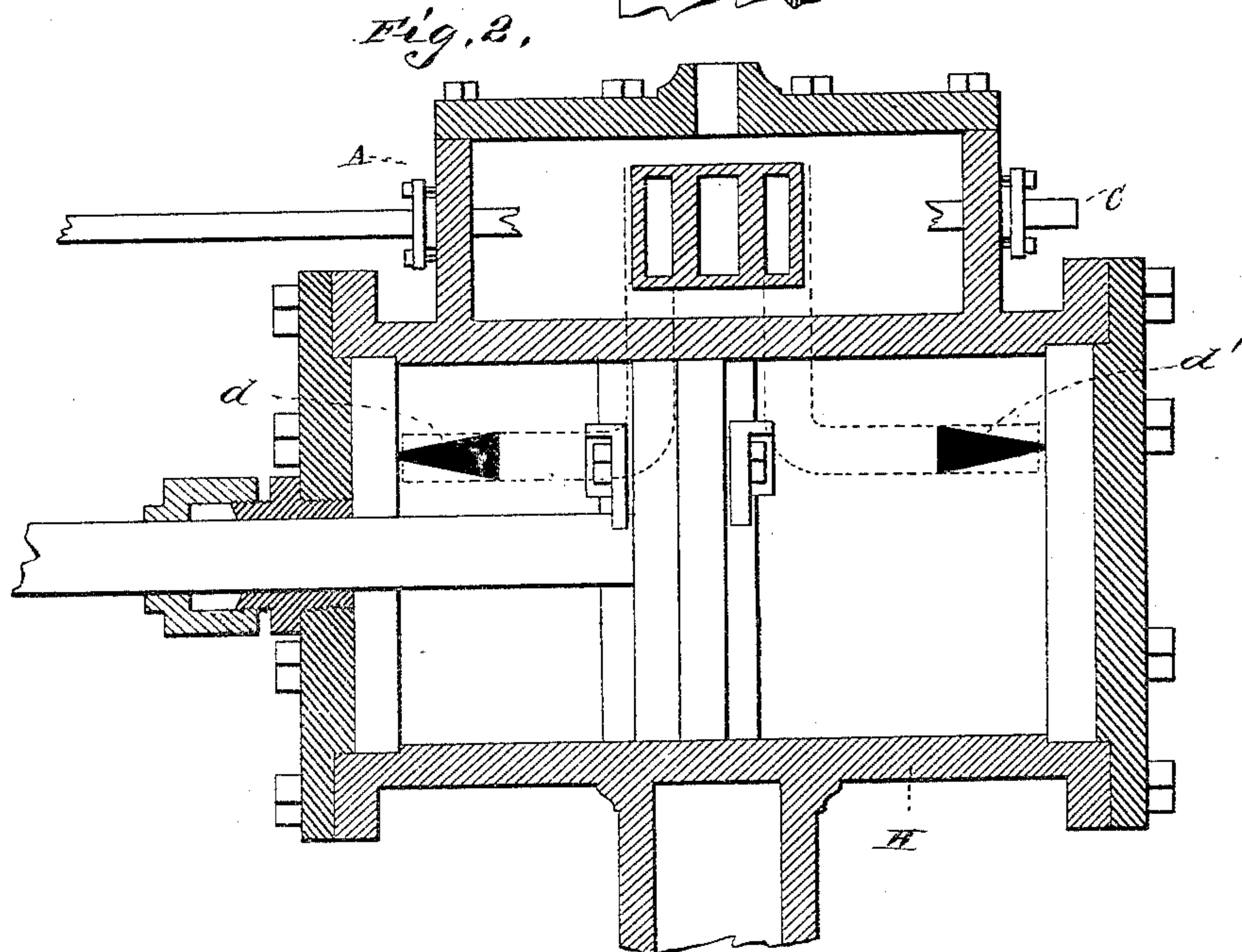
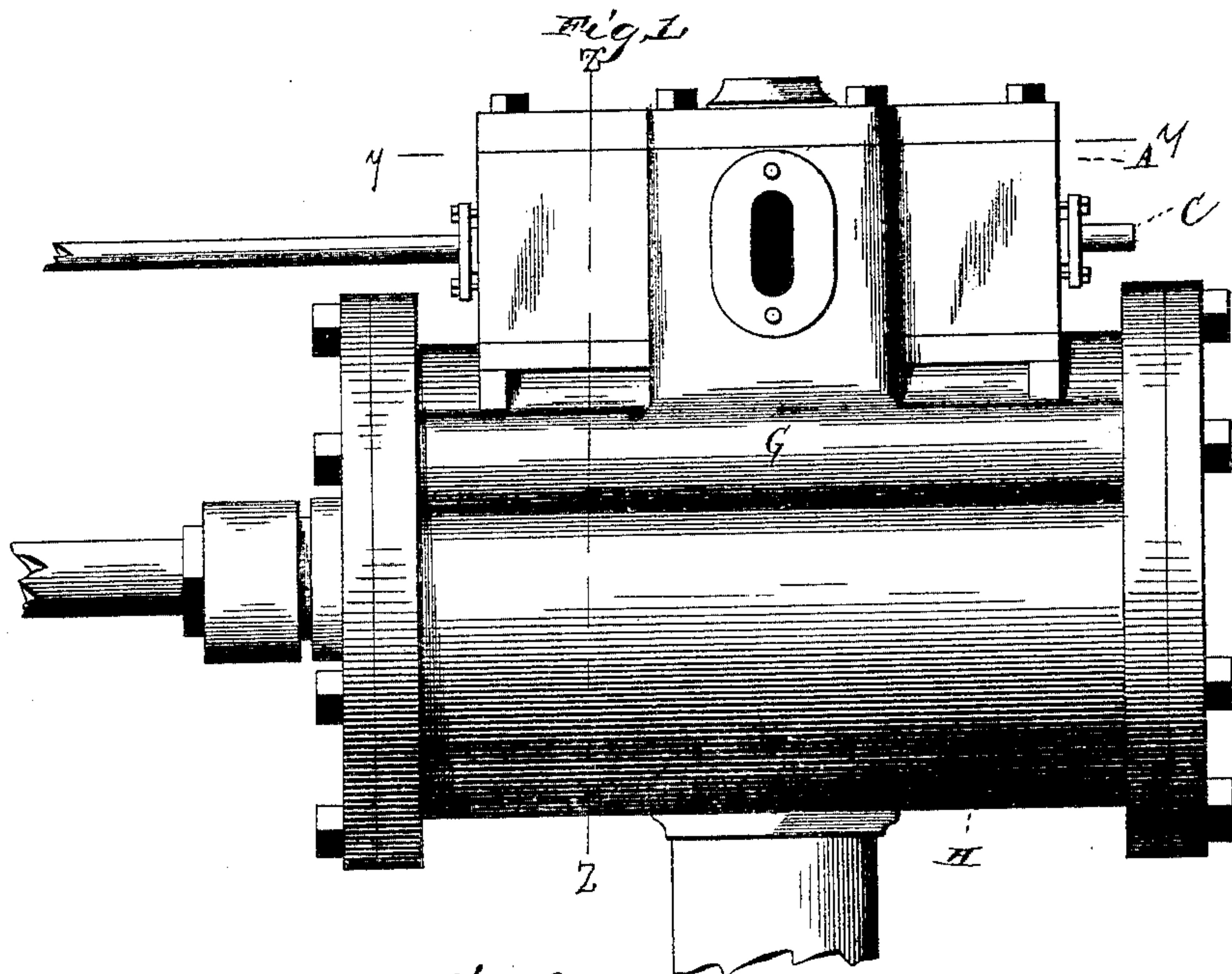
(No Model.)

2 Sheets—Sheet 1.

W. FRANKS.  
STEAM ACTUATED VALVE.

No. 460,858.

Patented Oct. 6, 1891.



WITNESSES:

*Chas. L. Taylor,*  
*Phill. Masi.*

INVENTOR

*William Franks*

BY

*E. W. Anderson*

*his*

ATTORNEY.

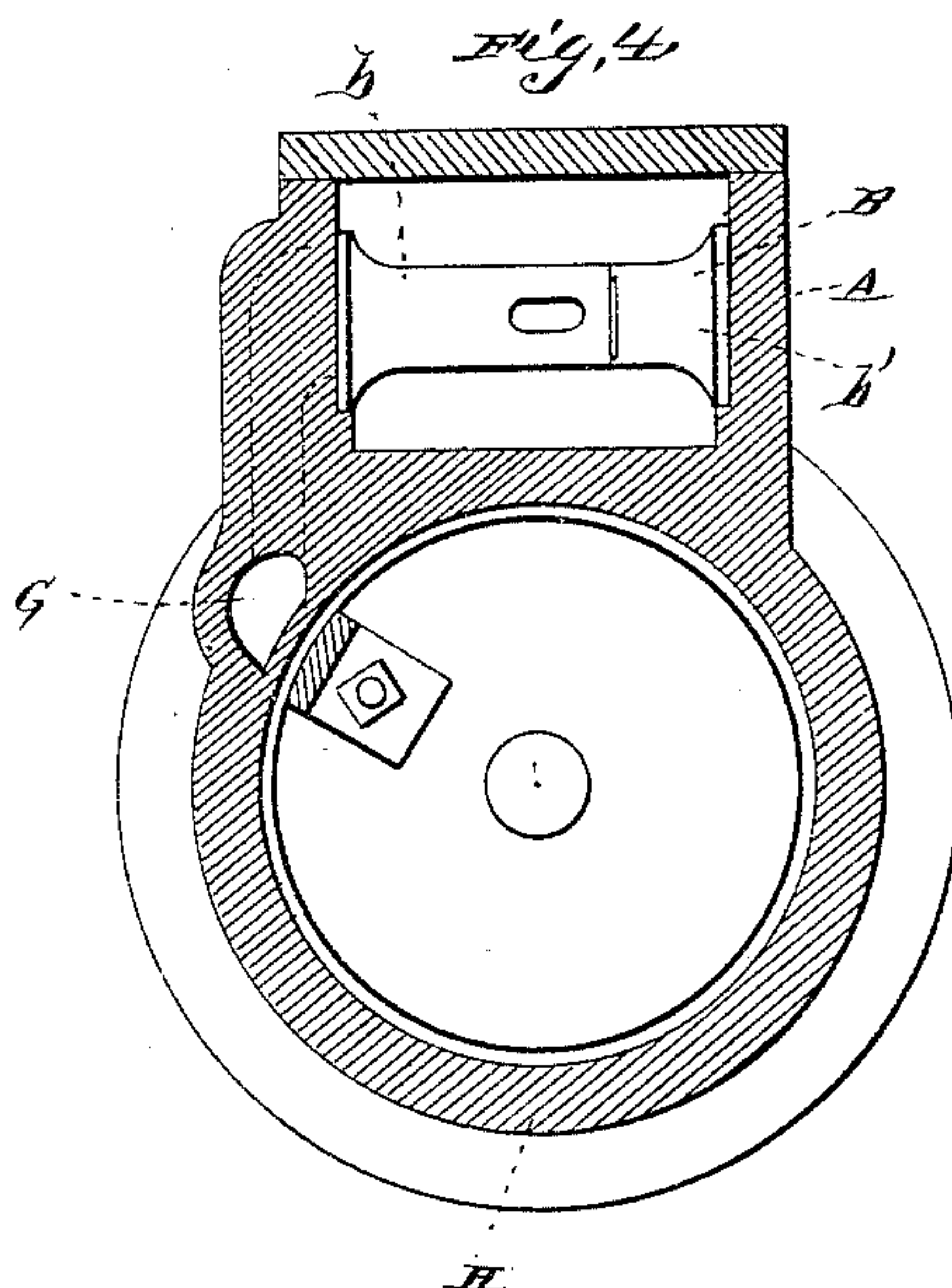
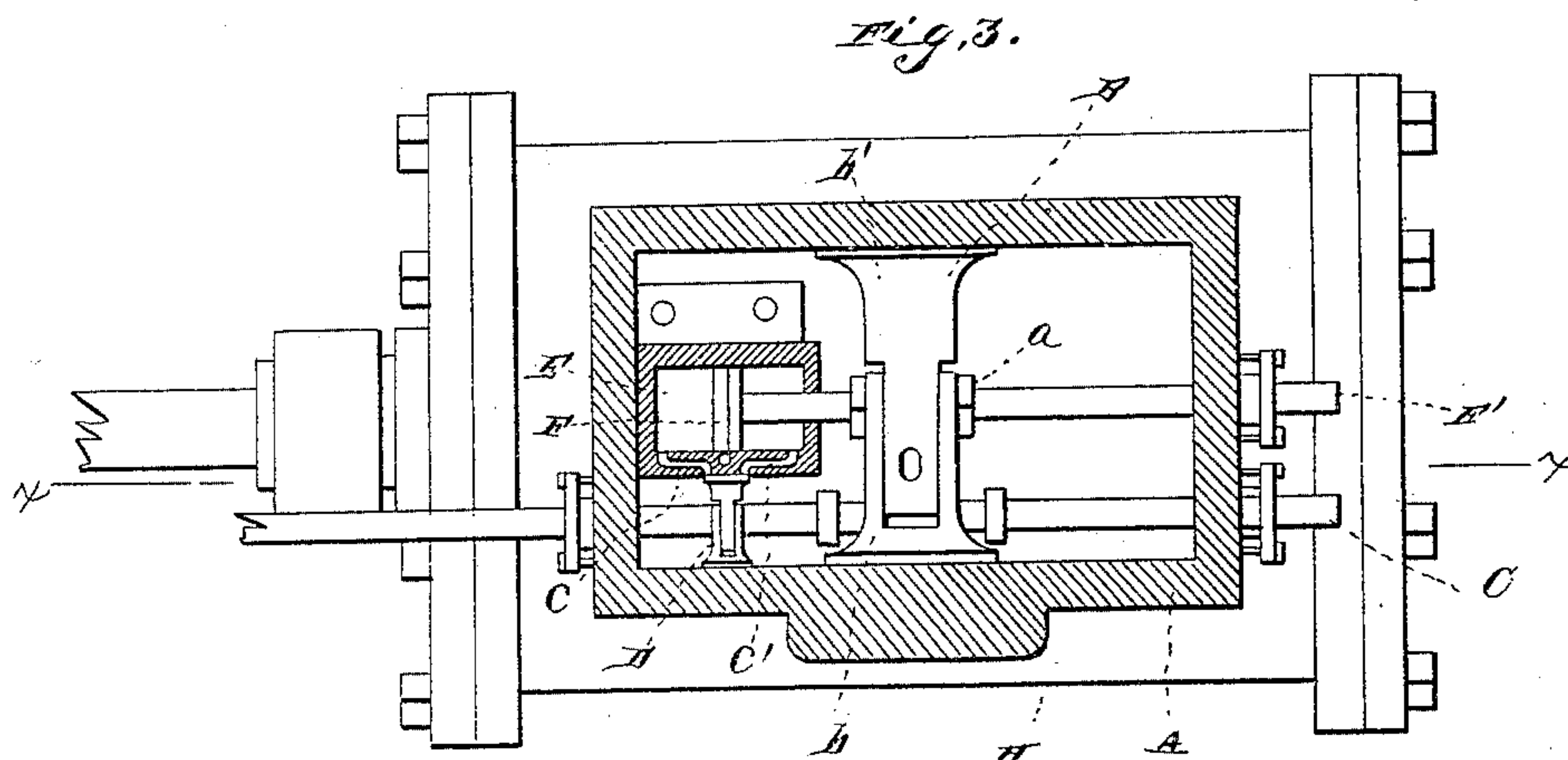
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# UNITED STATES PATENT OFFICE.

WILLIAM FRANKS, OF MUSKEGON, MICHIGAN.

## STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 460,858, dated October 6, 1891.

Application filed October 31, 1890. Serial No. 369,905. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM FRANKS, a citizen of the United States, and a resident of Muskegon, in the county of Muskegon and State of Michigan, have invented certain new and useful Improvements in Steam-Actuated Valves; and I do 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a side elevation. Fig. 2 is a vertical central section of Fig. 1. Fig. 3 is a horizontal section taken on line *y y*, Fig. 1. Fig. 4 is a vertical transverse section taken on line *z z*, Fig. 1.

The invention relates to certain new and useful improvements in valve and port mechanism for steam-pumps.

The object of the invention is to provide a slide-valve for pumps of the character mentioned, which can be readily adjusted to make up for any wear of the parts, which will be so constructed as to prevent any possibility of centering, and which will be so hung or balanced as to reduce the amount of friction to a minimum.

A further object is the provision of suitable mechanism in connection therewith for the operation of said valve.

One great aim or object in the production of steam-pumps heretofore has been the attempt to render them noiseless, or, in other words, to prevent their "pounding." These attempts have not proved successful, it being found necessary to the accomplishment of this end that the water-cylinder should be kept filled with water, and suitable mechanism for the operation of the piston and valves has not been employed for this purpose; and a further object of this invention is to so construct and arrange the main ports of the steam-cylinder that when the piston is near the end of its stroke in either direction it will nearly close the port at that end, compressing the exhaust-steam, which will act as a cushion. The said port, being nearly closed by the piston, will at first admit but a small amount of steam to the cylinder, thus causing

the piston to start slowly on its return movement, giving the water-valves full time to act, thereby preventing pounding, the pump consequently doing more work and with less wear and tear of the parts.

With these objects in view the invention consists in the novel construction and combination of parts, as hereinafter described.

In the accompanying drawings, the letter A represents the steam-chest, having arranged therein my improved valve and valve-operating mechanism.

B represents the main valve, which is formed of the two parts *b* and *b'*, fitted together and adjustably bolted or clamped, as shown at *a*, so that whenever the faces of the valve become worn the bolt or clamp may be adjusted to again give it a perfect fit. This valve is mounted on a rod or plunger C, which near one end of the chest also carries a second valve D, which consists of two sections adjustably fitted together and held in the same manner as valve B. The valve D is, however, much smaller than valve B.

E represents a steam chamber or cylinder located at one end of the steam-chest about midway its height, and is provided at the central bottom portion with the induction-ports *c c'*, which are operated by the auxiliary valve D, as will be described. Said chamber or cylinder also has suitable exhausts. A piston F on a piston-rod F' works in said chamber or cylinder, said piston-rod being rigidly connected to the valve B at its central portion.

The rod or plunger C projects through the ends of the steam-chest A, and is operated by tappets connected with the main piston and operated thereby, giving said rod or plunger a reciprocal longitudinal movement, giving the slide-valve D a similar movement, admitting steam, respectively, to the opposite ends of cylinder E from the chest A through the ports *c c'*, thereby operating the piston F and the main valve B, connected to the piston-rod F'.

*d d'* are the main ports, between which the valve B is located, and which the said valve is adapted to operate. These ports extend down to the longitudinal chamber G, arranged on the upper side portion of steam-cylinder H, said ports extending longitudinally through



said chamber to points near each end thereof, where they enter cylinder H. The mouths of these ports where they enter cylinder H are gradually contracted in cross-section 5 from the inner to the outer end, or end nearest that end of the cylinder, coming to a point at their extreme ends, as shown. It will be seen that as the piston approaches either end of its stroke it will nearly cover the contracted 10 mouth of the port at that end, the exhaust-steam being compressed and forming a cushion. As the port *d* or *d'* is opened by the operation of the valve B, in the manner described, the amount of steam at first admitted 15 to the cylinder will be small, only what can enter through the contracted portion of the port. Consequently the return movement of the piston will be slow at first, gradually increasing as the whole port is opened. 20 This will prevent the pounding which occurs when the piston receives at once the full port of steam and is quickly drawn away before the water-valves have time to react, rendering the operation of the pump more nearly 25 noiseless and reducing the amount of wear and tear of the parts. By this construction the water-cylinder has time to completely fill,

so that the pump is capable of doing a greater amount of work than as ordinarily constructed.

The valves B and D are made a trifle—say 30 one-sixty-fourth of an inch—shorter than the distance from outside to outside of ports, so that they cannot possibly strike a center. The said valves are almost perfectly balanced, thus reducing the friction to a minimum. 35

Having described the invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination, with the steam-chest, of the main steam-ports leading therefrom and 40 having the gradually-contracted mouths, the adjustable slide-valve in said chest controlling said ports, the cylinder in said chest, the piston working in said cylinder and operated by the rod of said valve, and the ports leading 45 from the steam-chest into said cylinder and controlled by a tappet-rod, substantially as specified.

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

WILLIAM FRANKS.

Witnesses:

C. W. WRIGHT,

DANIEL UPTON, Sr.