

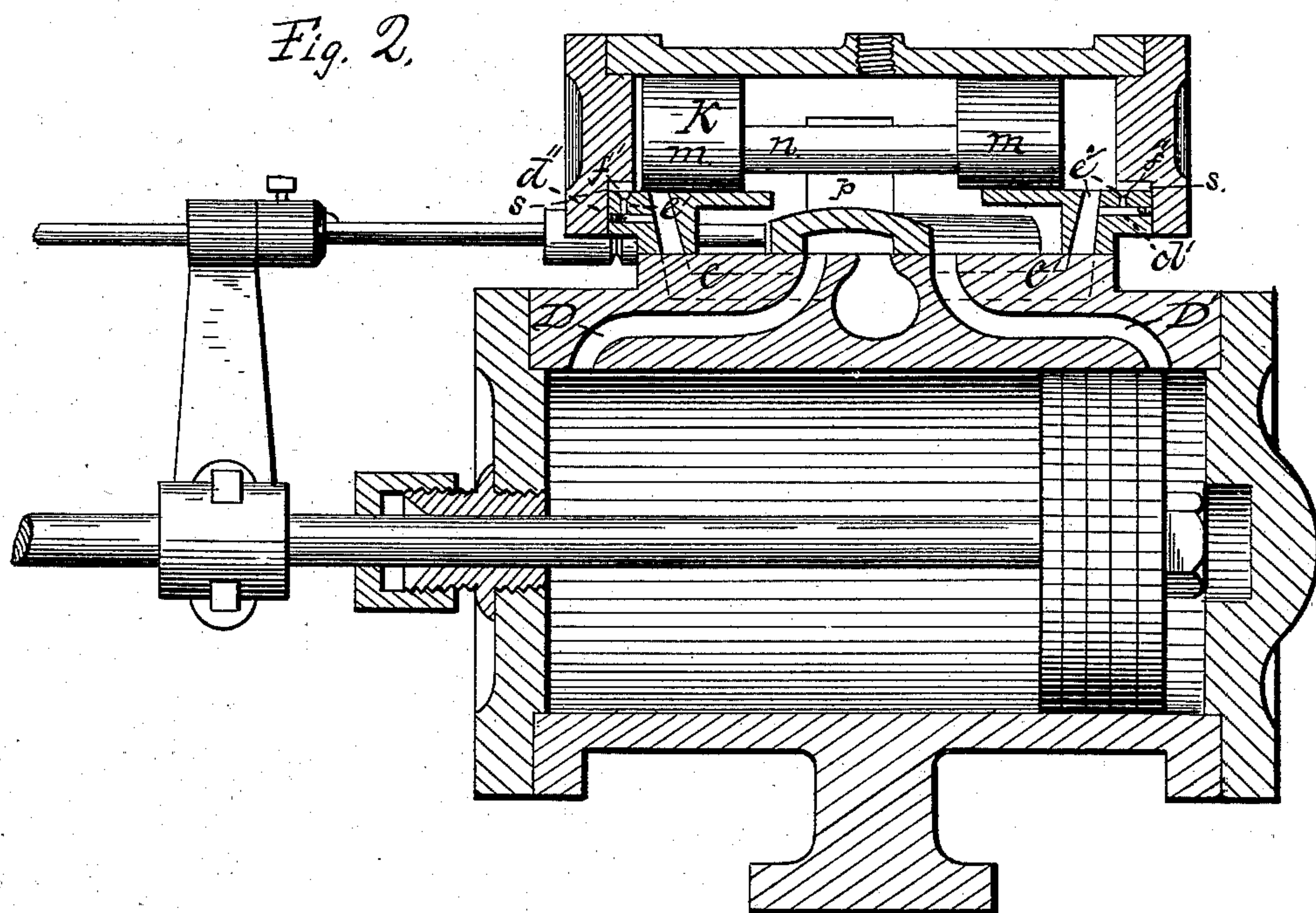
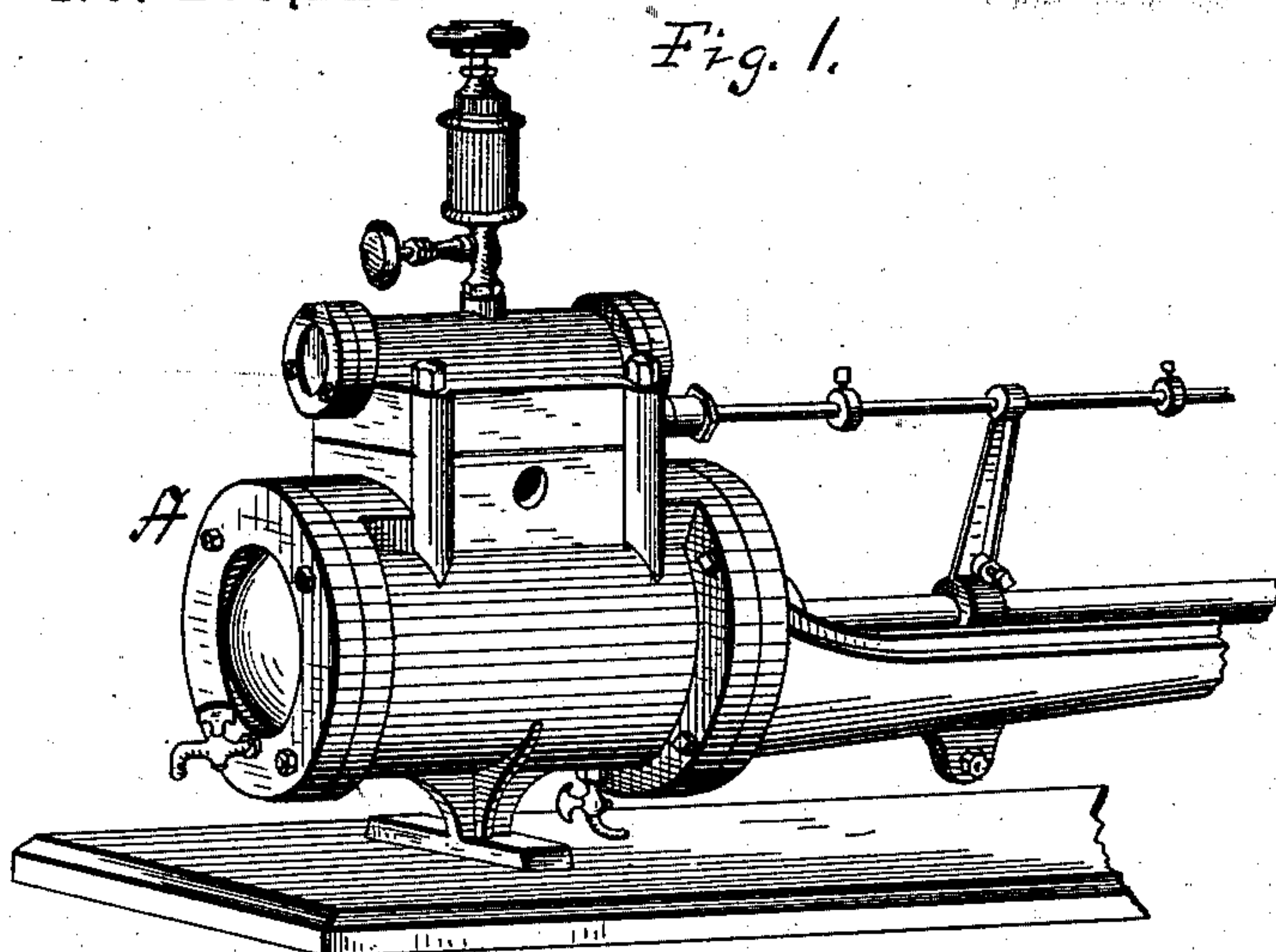
(No Model.)

3 Sheets—Sheet 1.

G. E. ELLIOTT.  
STEAM ACTUATED VALVE.

No. 283,226.

Patented Aug. 14, 1883.



WITNESSES  
*Frank L. Curran*  
*J. Chang*

INVENTOR  
*Geo. E. Elliott,*  
*by Hyman & Kang,*  
Attorneys

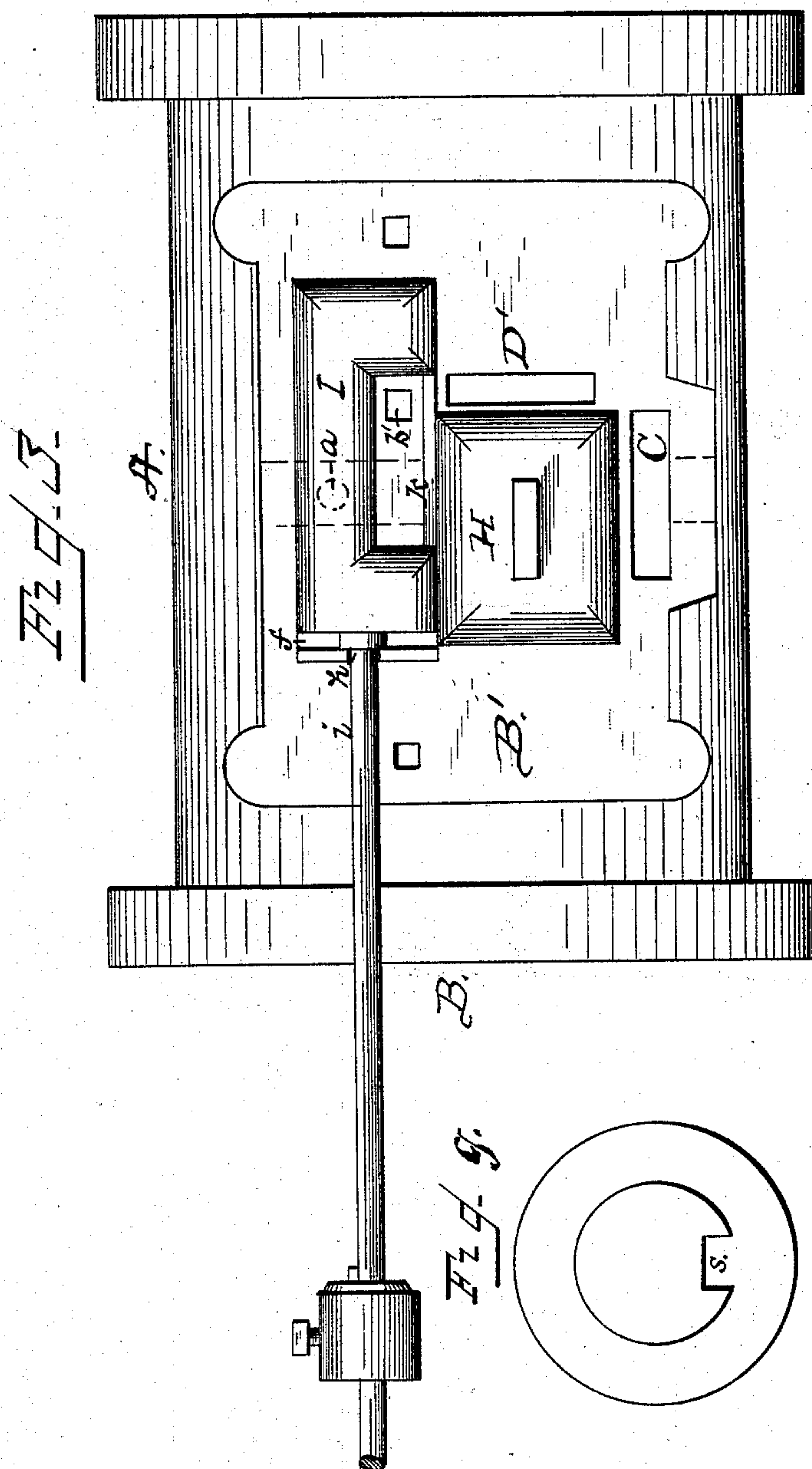
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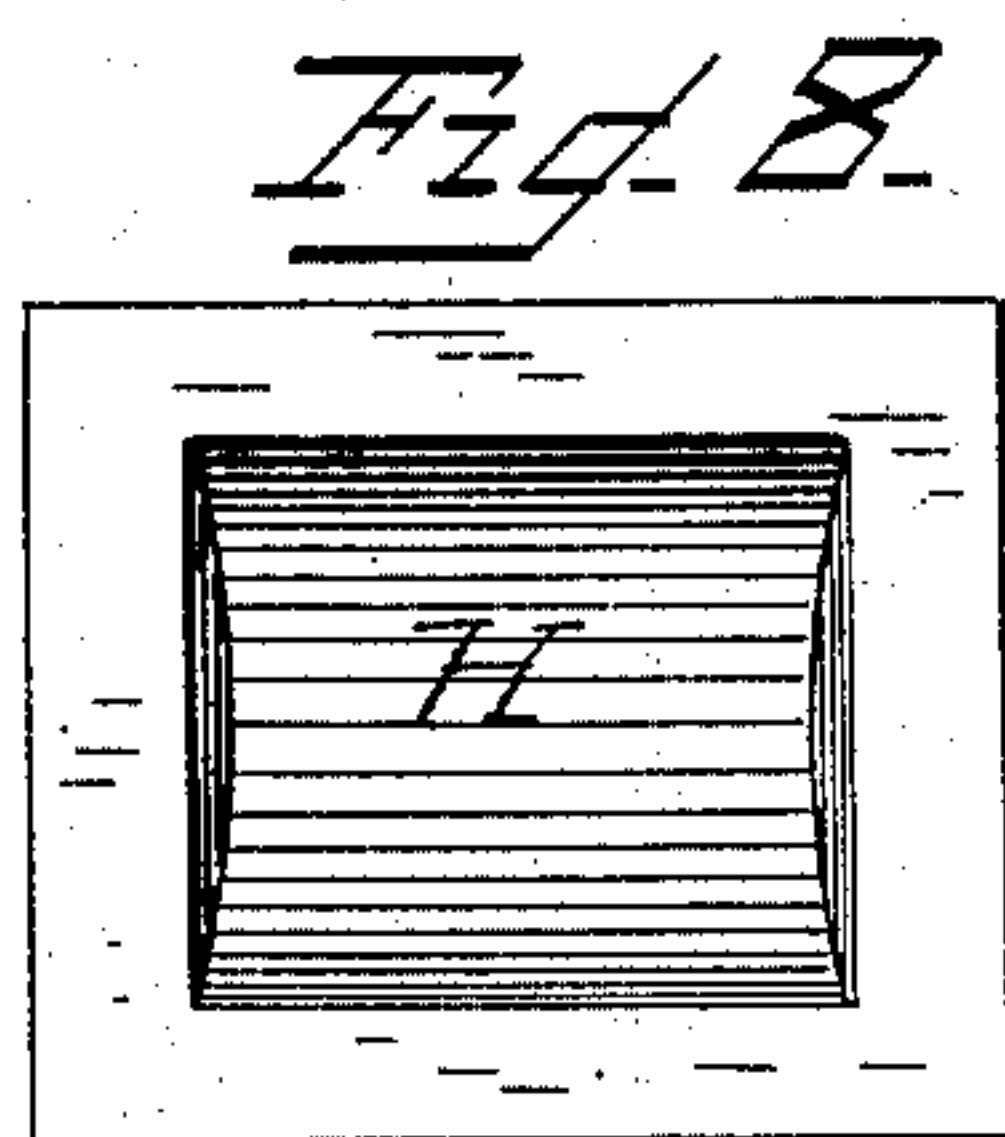
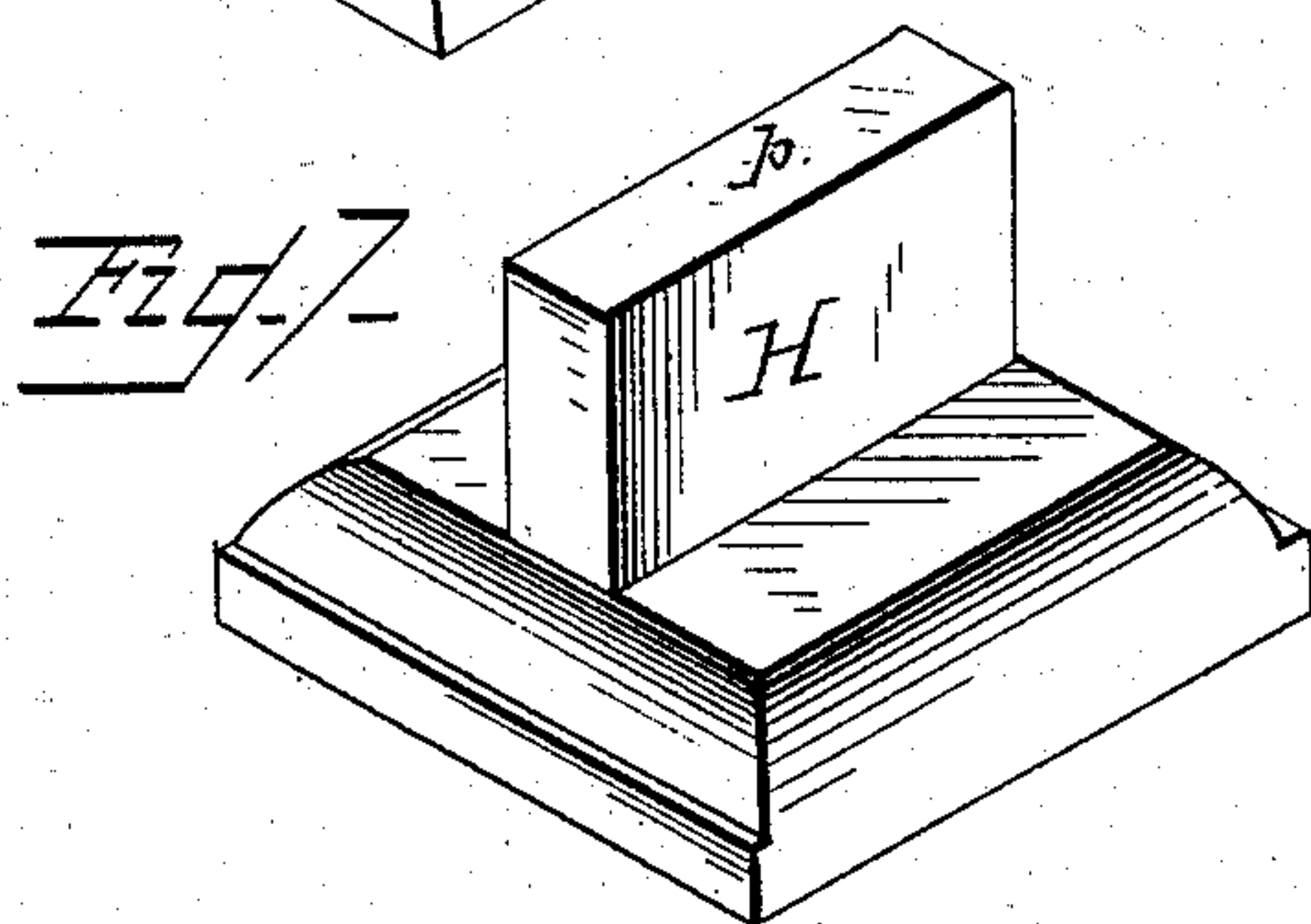
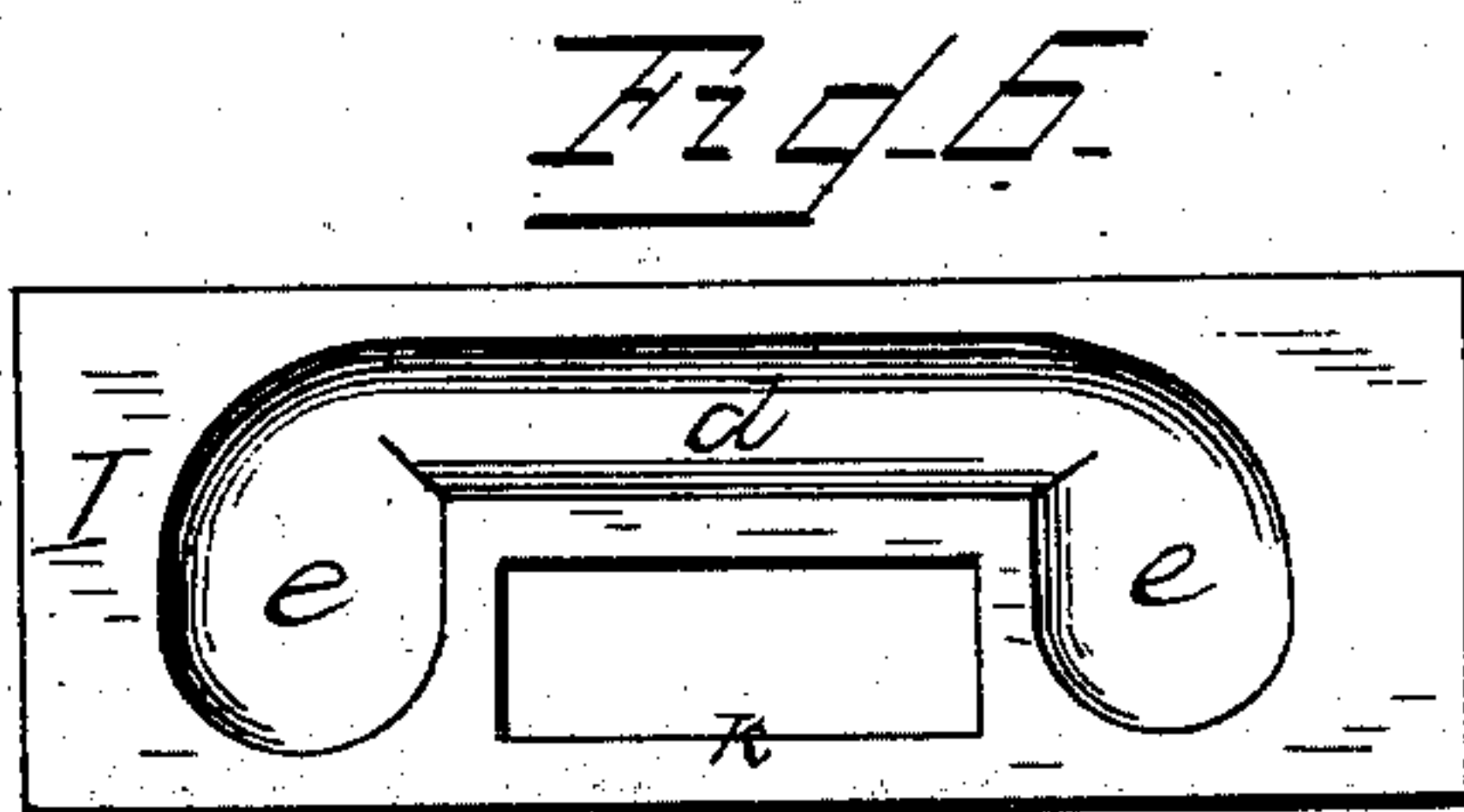
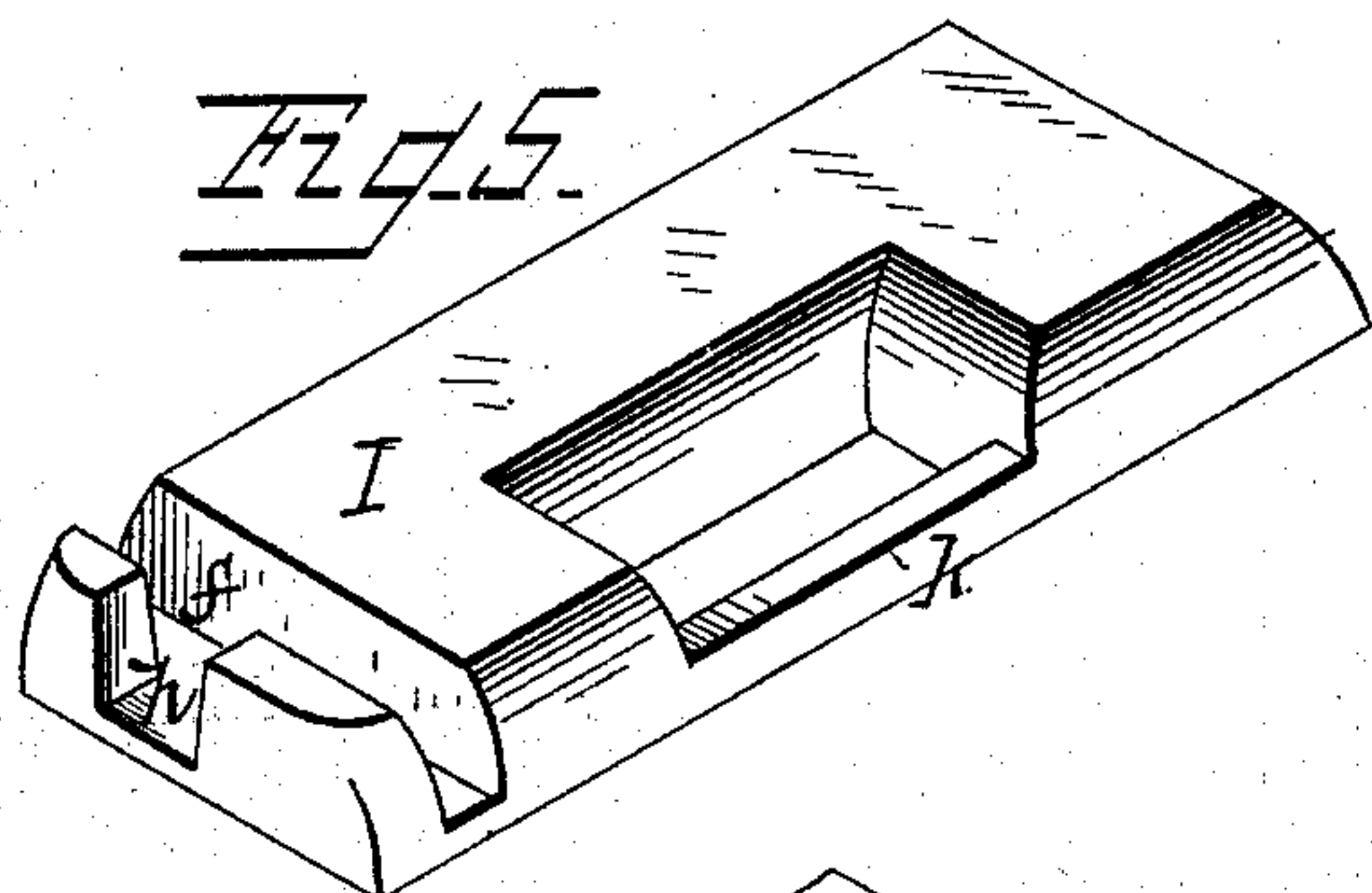
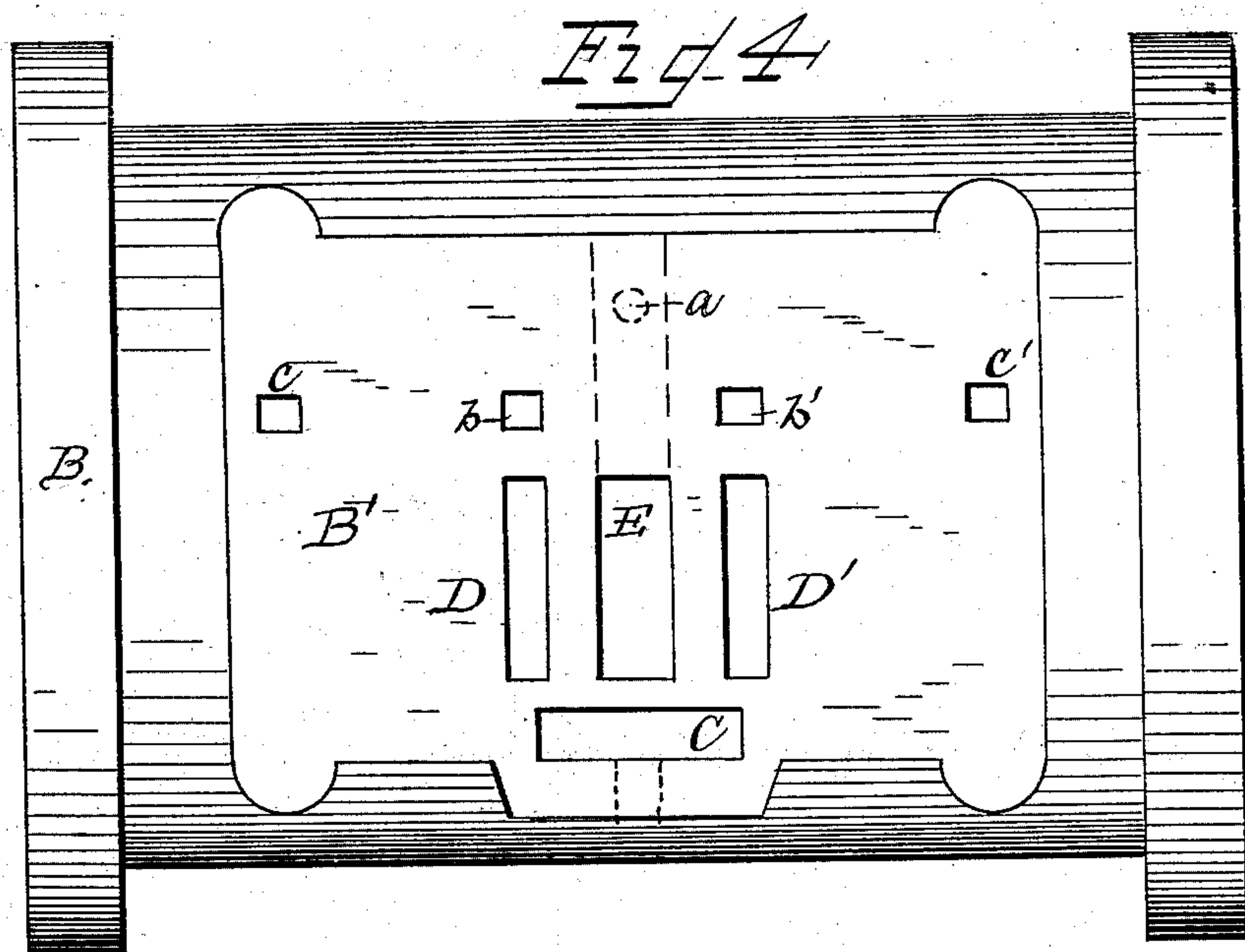
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INVENTOR  
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By Heylman & Kang,  
Attorneys.



# UNITED STATES PATENT OFFICE.

GEORGE E. ELLIOTT, OF CALAIS, MAINE, ASSIGNOR OF ONE-HALF TO  
EDWARD J. CRANGLE, OF SAME PLACE.

## STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 283,226, dated August 14, 1883.

Application filed April 20, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE E. ELLIOTT, a citizen of the United States of America, residing at Calais, in the county of Washington and State of Maine, have invented certain new and useful Improvements in Steam-Actuated Valves for Direct-Acting Steam-Pumps; 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.

This invention relates to that class of steam-pumps known as "direct-acting;" and it has for its main objects to arrange the main and auxiliary valves on the same plane, and to obviate certain difficulties pertaining to the working of steam-pumps of this class.

My improvement consists in the novel construction, combination, and arrangement of parts, as will be hereinafter more fully set forth.

In the annexed drawings, Figure 1 is a perspective view of the steam end of the pump. Fig. 2 is a view in longitudinal vertical section of the steam end of a steam-pump constructed according to my invention. Fig. 3 is a plan view of a steam-cylinder with the main and auxiliary valves in position. Fig. 4 is a plan view of a steam-cylinder embodying some of my improvements, the main and auxiliary valves being removed, so as to expose the peculiar arrangement of the parts. Figs. 5 and 6 are views of the auxiliary valve. Figs. 7 and 8 are views of the main valve, and Fig. 9 is an interior view of the steam-chest head, showing the recess for the cushion-valve.

In Fig. 1 of the drawings, the letter A represents the general form and arrangement of the pump, which may be of any suitable size and construction, equipped with my improvements.

The cylinder B is formed with a valve-seat, B', provided with a plurality of ports, arranged as follows: Situated at one side of the seat (see Figs. 3 and 4) is the steam-supply port C. Near the center are the usual inlet-ports, D D', leading into the ends of the cylinder,

and the exhaust-port E, arranged between the said inlet-ports. The opposite side of this seat has an exhaust-port, *a*, for the auxiliary valve, as will be hereinafter described. Arranged between this port *a* and the inlet and exhaust ports D D' E are the auxiliary steam-ports *b b'* for the auxiliary valve, and leading to the auxiliary steam-chest. On the valve-seat, adapted to travel over the ports D D' E, is the main or slide valve H, which is preferably of the usual D-valve class, and along-side of this main valve, adapted to travel over the auxiliary ports *b b'* and exhaust-port *a*, is arranged the auxiliary valve I, as shown in Fig. 3. This valve I on its under side is formed with a longitudinal cavity, *d*, and end cavities, *e e*, leading into each other, as shown in Fig. 6, and on its upper side with a transverse groove, *f*, and a slot, *h*, leading into the same for the passage and reception of the valve-stem *i* and its head. This cylinder and the steam-chest (see Figs. 2 and 4) are also constructed with auxiliary ports *c c'* for leading live steam into and exhausting the dead steam from the chamber containing the auxiliary piston K. These auxiliary ports *c c'* are provided with lateral branch ports *d' d''*, leading to vertical escape-passages *e' e''*, the former being provided with cushion-valves *f' f''*, opening into the steam-pockets formed in the head of the auxiliary steam-chest. The office of these branch passages *d' d'' e' e''* with the valves *f' f''* is to admit the steam to the interior of the auxiliary-piston chamber after the auxiliary valve has closed the port, and to provide a steam-cushion at each end to lessen the force of the stroke against the head. The side bar, *k*, of the valve connects the open ends and affords a bearing for the valve.

More particularly describing the chest-piston or piston-valve K, which is located within a formed chamber at the upper end of the steam-chest, I state that it consists of the two piston-heads *m m* and the connecting-stem *n*. The central portion of the stem *n* is formed with a recess to receive the upward projection or arm *p* of the main valve, and to which, through the agency of the movement of this piston-valve, motion is imparted.



By reference to Figs. 2 and 9, it will be observed that the inner face at the bottom of each end or head of the steam-chest is formed with a steam pocket or recess, *s*, forming cushion-valves.

The operation of my device is as follows: In Fig. 2, which is a sectional view, the parts are shown in the position that they assume when the piston is at its extreme right-hand stroke, in which position live-steam is admitted through the right-hand port, *D*, to the cylinder to act upon the right face of the piston, and as it so acts and forces the piston to the other end of the cylinder, the dead steam on the left of the piston is discharged through the port *D*, under the *D*-shaped valve, and through the exhaust-port in the usual manner. The arm *p* of the main valve fits into a slot formed in the central portion of the auxiliary piston, and the valve is operated by the reciprocating movement of the auxiliary piston. The auxiliary piston is operated by the force of the steam let through the auxiliary ports *c c'*, one being closed in the course of the auxiliary piston, and steam is admitted up through the smaller branch ports leading therefrom up through the cushion-valve ports, thereby causing the auxiliary piston to move when the auxiliary valve *I* has moved to admit the steam in the auxiliary ports. The strokes of the auxiliary piston in either direction are checked by the action of the steam-cushion, which traps the exhaust-steam after the auxiliary piston has traversed by and closed the port, thereby making a steam-cushion with force sufficient to prevent the auxiliary piston from striking the head with force. The auxiliary valve is operated by the tappet-arm on the main piston-rod, and in the drawings, Fig. 3, is shown in position to admit steam to the right-hand port, and exhausting from the left-hand port through the exhaust-port proper.

I claim the right to vary the construction of

parts without departing from the spirit of the invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A steam-chest the heads whereof have steam-pockets formed in their under side opening into the interior of the auxiliary steam-chest, and communicating with auxiliary ports through branch ports provided with valves opening into the steam-pockets, in combination with an actuated piston-valve, substantially as described.

2. In combination with a valve-seat carrying a main valve and an auxiliary valve moving side by side on the same plane, the auxiliary steam-ports having lateral and upward branch ports opening into pockets in the auxiliary steam-chest, and the actuated piston-valve, substantially as described.

3. In combination with the valve-seat carrying a main valve and an auxiliary valve moving on the same horizontal plane, the auxiliary steam-ports opening into pockets formed in the heads of the auxiliary steam-cylinder, and provided with valves and piston-valve, substantially as described.

4. The auxiliary steam-chest having its end heads formed with the pockets or recesses adapted to admit the movement of a vertical valve, substantially as and for the purpose set forth.

5. An auxiliary valve, *I*, for a valve-seat of a steam-engine, formed on its under side with a longitudinal cavity, *d*, and end cavities, *e e*, leading into each other, substantially as shown and described.

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

GEORGE EDMUND ELLIOTT.

Witnesses:

GEO. H. BOARDMAN,  
WILLIAM F. BOARDMAN.