

(No Model.)

2 Sheets—Sheet 1.

H. C. LANGREHR.

COMPOUND PUMP.

No. 280,835.

Patented July 10, 1883.

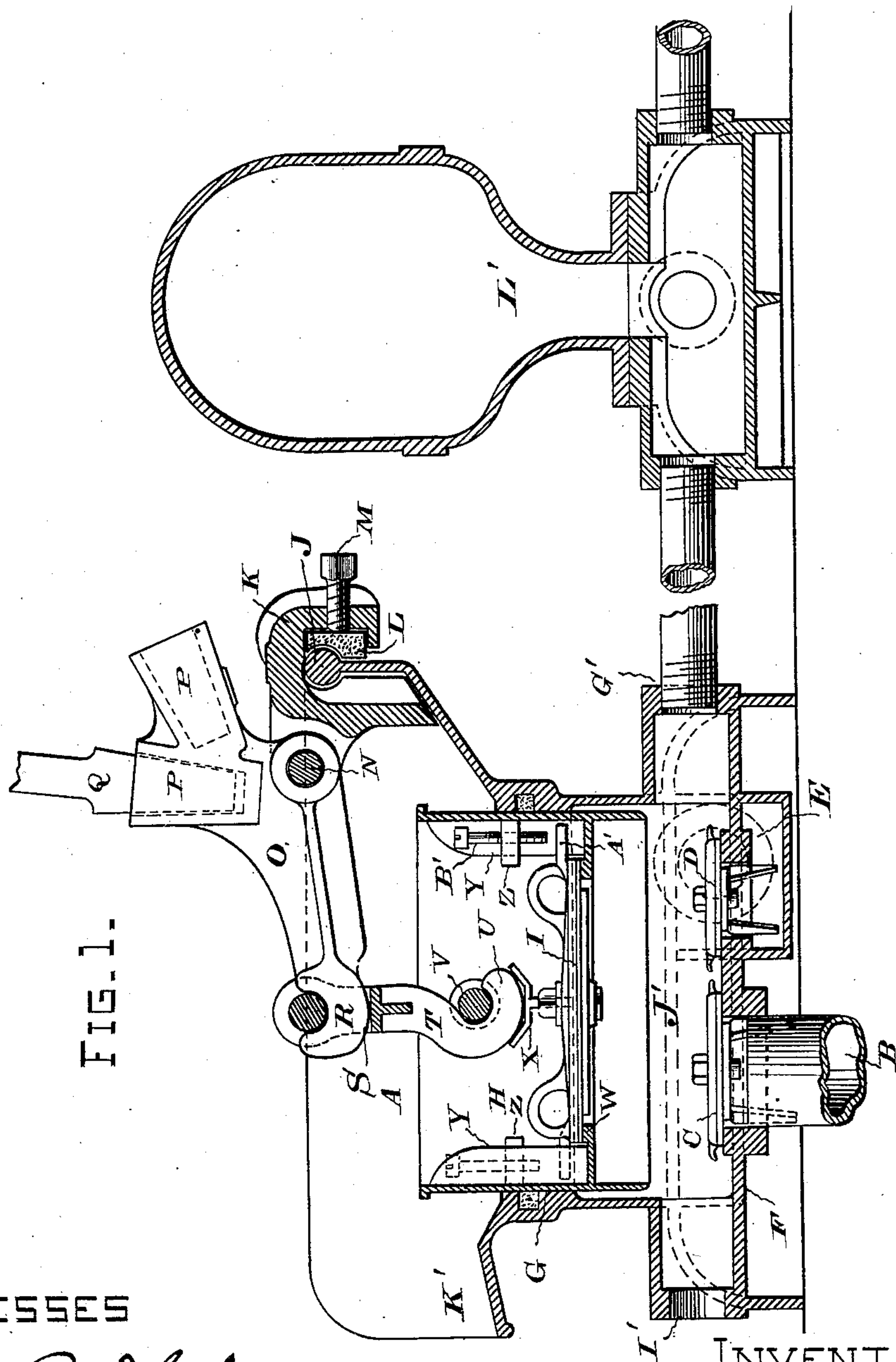


FIG. 1.

WITNESSES

William Bradford
George Derby

INVENTOR.

Henry C. Langrehr
By C. M. Smith
Attorney

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FIG. 2.

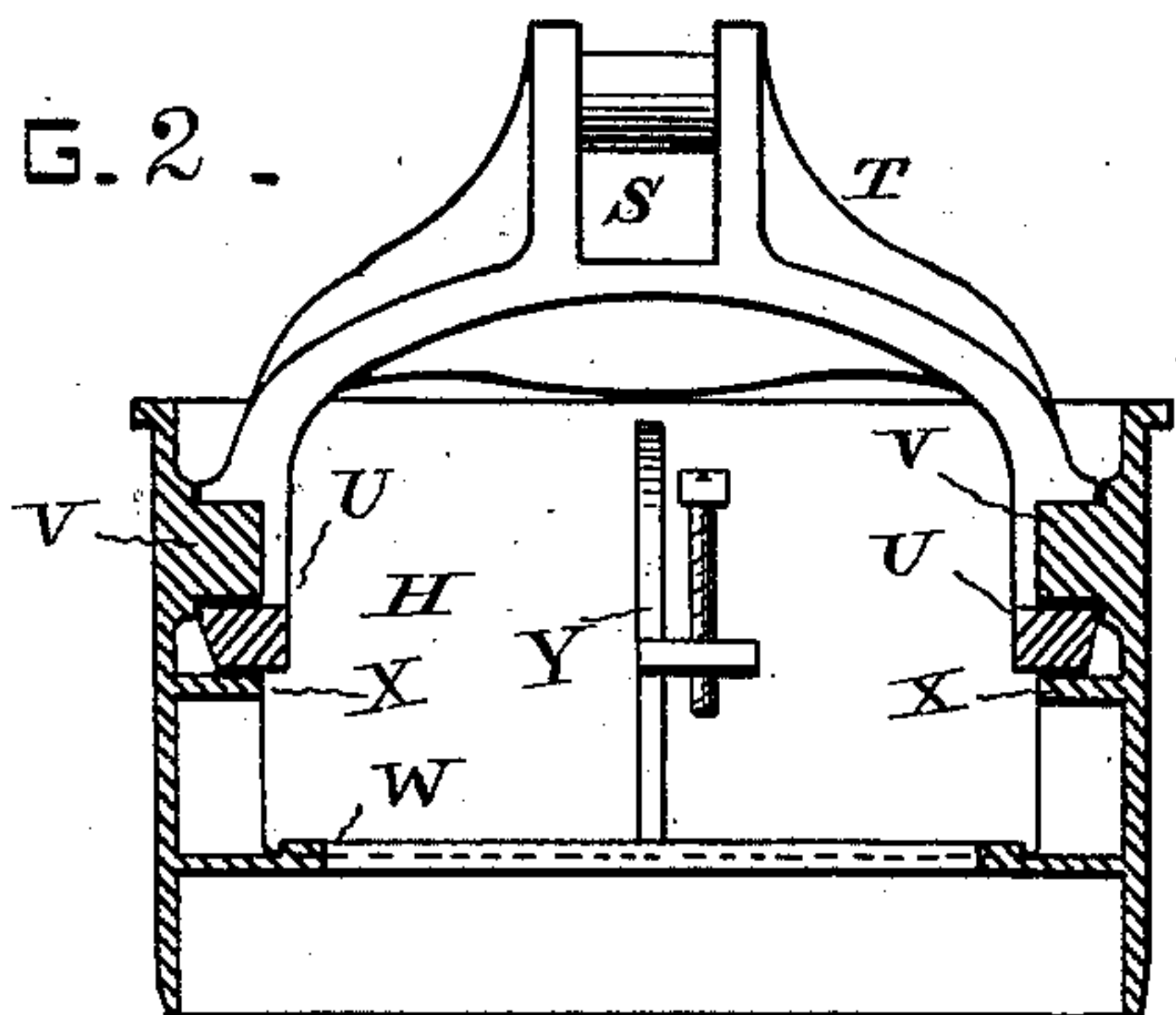


FIG. 3.

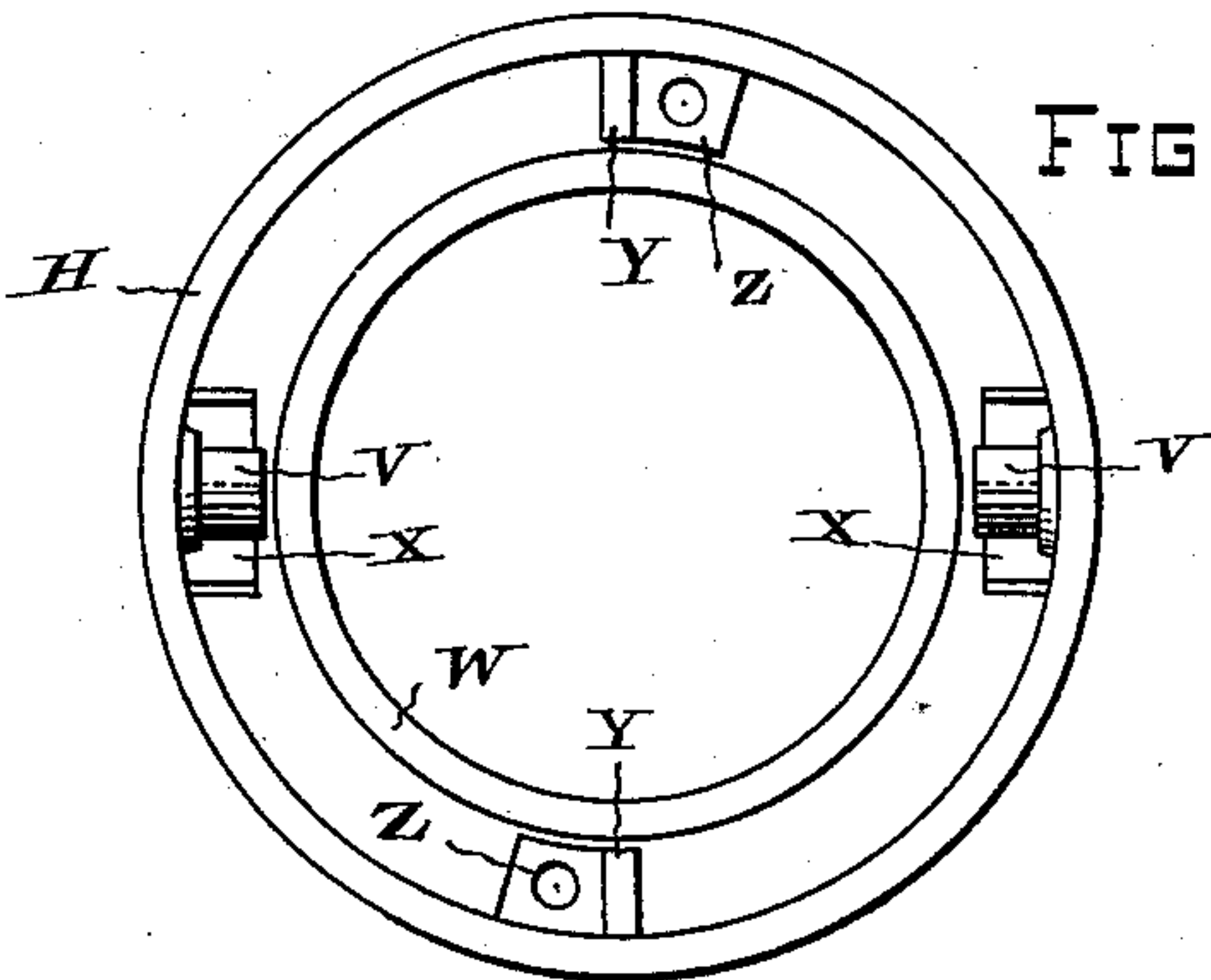


FIG. 4.

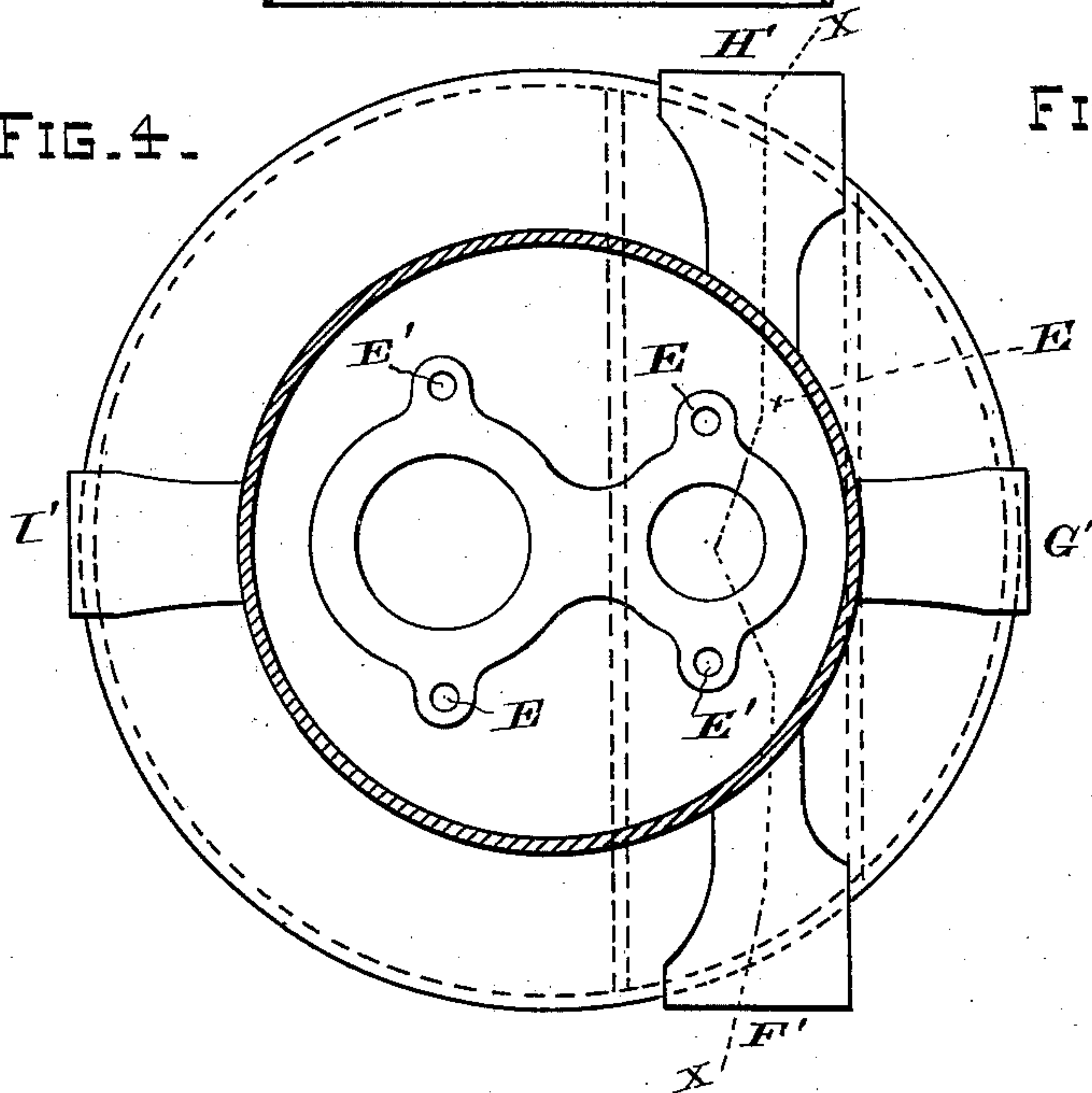


FIG. 5.

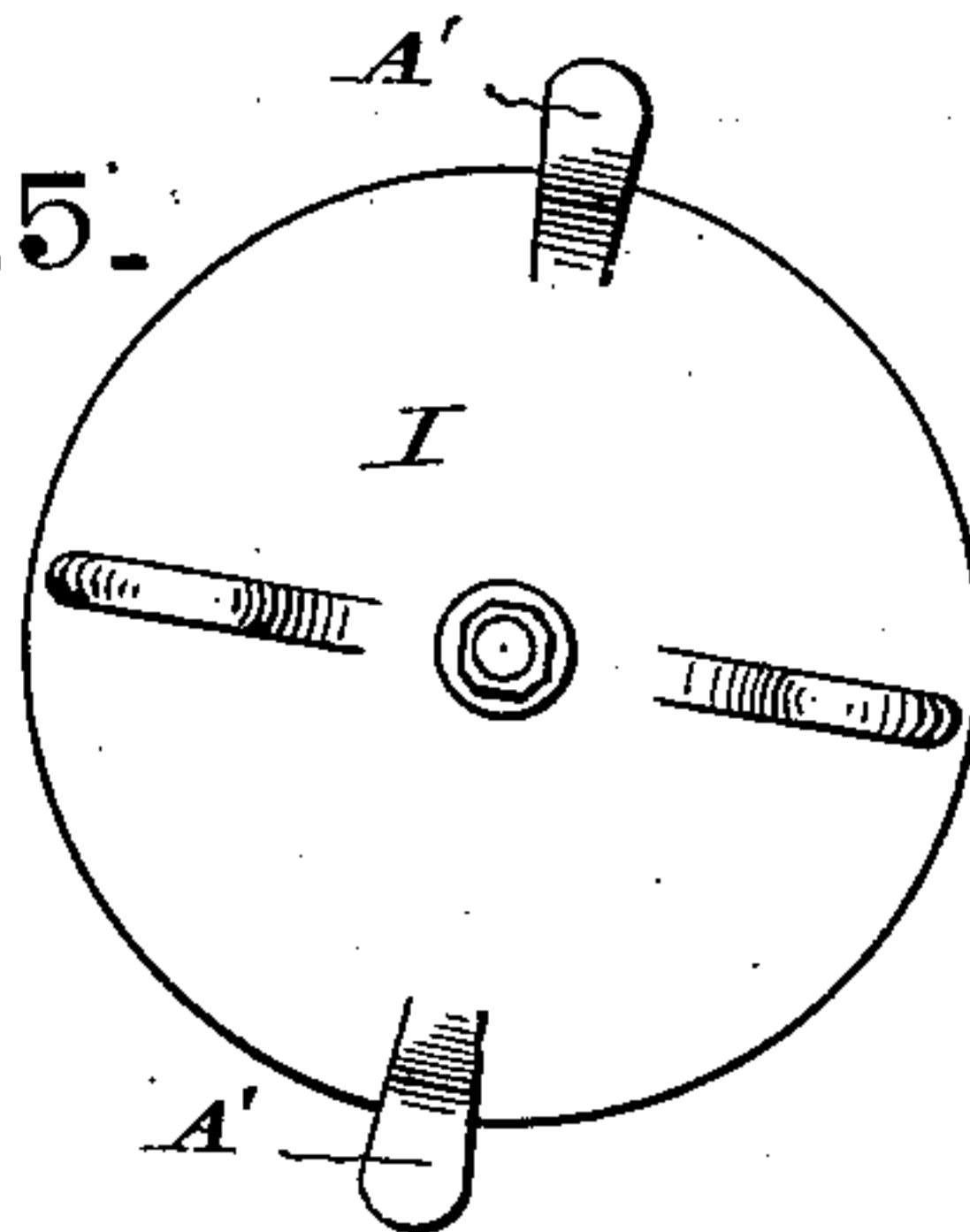


FIG. 6.

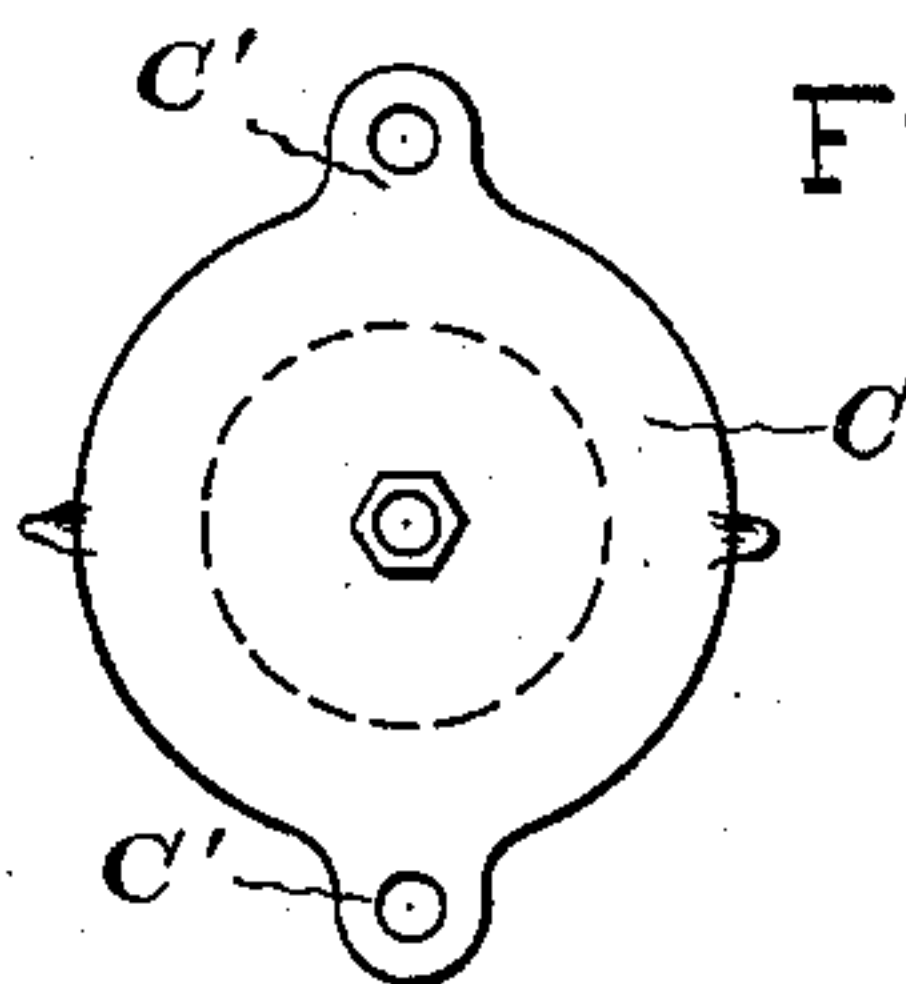
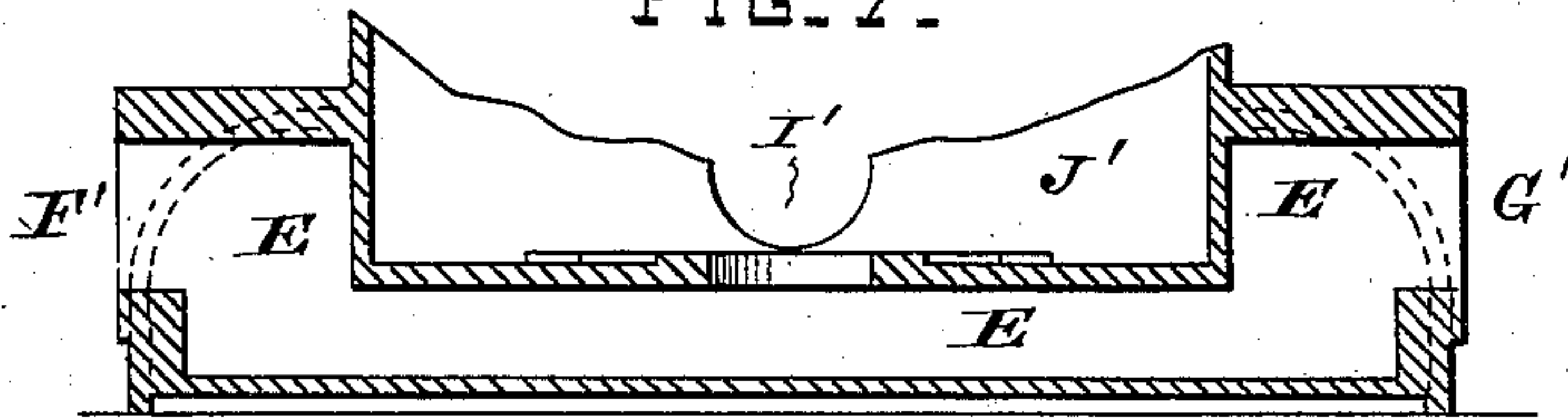


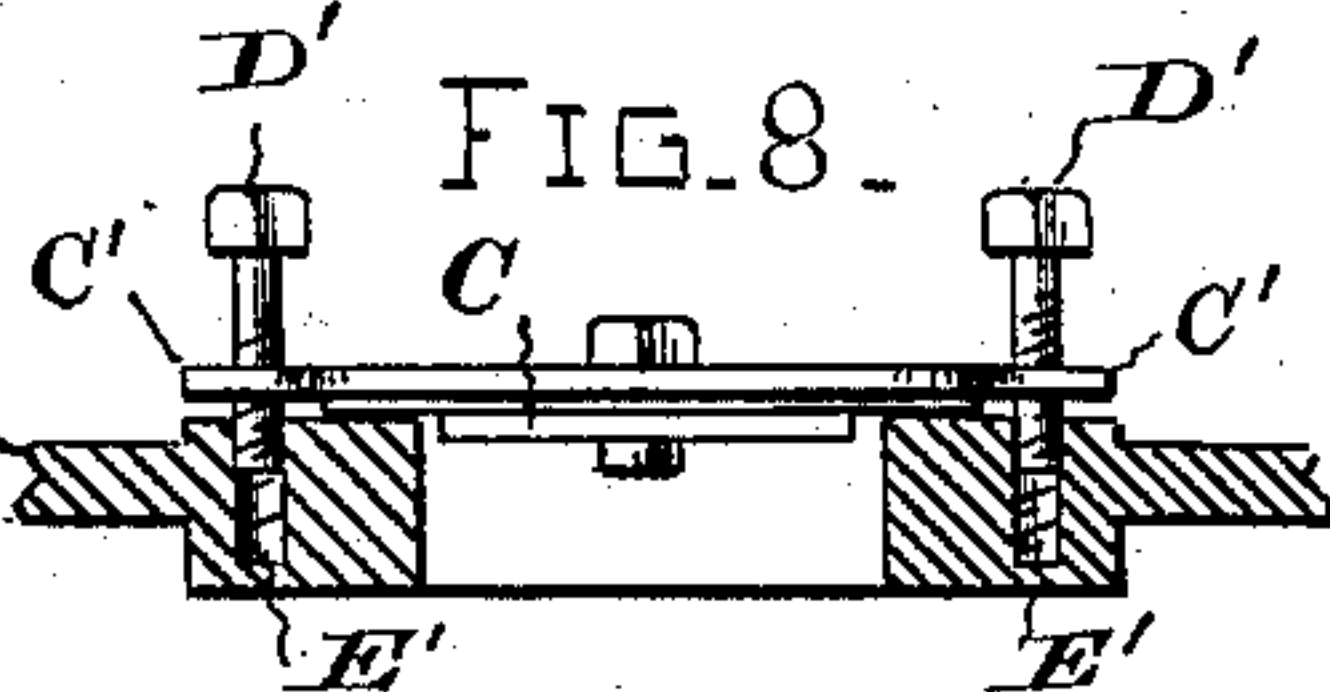
FIG. 7.



WITNESSES.

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FIG. 8.



INVENTOR.

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UNITED STATES PATENT OFFICE.

HENRY C. LANGREHR, OF SAN FRANCISCO, CALIFORNIA.

COMPOUND PUMP.

SPECIFICATION forming part of Letters Patent No. 280,835, dated July 10, 1883.

Application filed November 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. LANGREHR, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Compound Pumps, of which the following is a specification.

My invention relates to improvements in compound ships' pumps, or pumps which may be altered at will from a "lift" to a "force" pump, or vice versa.

Figure 1 is a sectional side elevation of the complete pump and its air-chamber. Fig. 2 is a vertical sectional view of the upper or lift-valve cylinder and of the connecting-hook. Fig. 3 is a plan view of the upper valve-cylinder. Fig. 4 is a plan view of the lower part of the pump-case, showing the seats of the lower valves. Fig. 5 is a plan view of the upper valve. Fig. 6 is a plan view of the lower valve. Fig. 7 is a vertical sectional view, taken on line X X of Fig. 4. Fig. 8 is an edge view of one of the lower valves and its seat.

Similar letters of reference are used to designate like parts throughout these several views.

The pump-case A is cast in the form shown, and is to be provided with the usual lugs for the reception of the bolts which secure the pump to place, and also with suitable induction and eduction water-passages.

The lower portion, F, of the base is provided with an opening which receives the bilge-pipe B, while the upper side of the opening forms a seat for the suction-valve C. At one side of this last-named opening there is formed a second opening provided with a suction-valve, D, communicating with a chamber, E, situated below the base F, and extending from side to side, as indicated by dotted lines in Fig. 4, and shown in Fig. 7.

At either end of the chamber E there are formed openings adapted for the reception of a hose communicating with the source of supply. At a point about midway of the height of the pump, but below the discharge line of the spout, I contract the casting, so as to form a guide-bearing, G, provided with a suitable packing-ring, and within which plays the cyl-

inder H, which carries the upper or lift valve, I.

The upper rim or edge of the pump-case is provided with a bead, J, as seen in Fig. 1. This bead J forms a bearing, upon which is clamped the movable lug K, the inner portion of which conforms to the contour of the pump-case, while the outer portion thereof holds a block of rubber or leather, L, which receives the thrust of the set-screw M, by which the lug is clamped to place upon any desired portion of the rim or bead J. The inner portion of this lug is provided with a bolt, N, upon which is fulcrumed the lever O, the upper surface or short arm of which is provided with sockets P P, as shown by dotted lines in Fig. 1, and are adapted to receive the handspike Q, by which the pump is operated.

The long arm of the lever extends inwardly, and is provided with an upwardly-curved hook, R, which enters a slot, S, formed in the upper part of the connecting-link T. The lower portion of this link is forked, or provided with two downwardly-projecting hooked arms, U U, which hook under the lugs V V, cast upon the inner surface of the open-ended cylinder H, and which project horizontally therefrom above the seat W of the upper or lift valve, I.

Beneath the lugs V there are formed T-shaped projections X X, the upper portion of which conforms somewhat to the shape of the under side of the hooks U U, and by closely underlying them forms a bearing against which the hooked arms press to force the cylinder down within its casing when the downstroke of the pump is made.

Intermediate between the projections X X are formed vertical ribs Y Y, and these, together with the vertical portion of the projections X X, form guides between which the upper or lift valve, I, rises and falls.

The space between the inner faces of the two hooks U U is less than the diameter of the valve I, and, upon reference to Fig. 2, it will be seen that the inward projection given to said hooks, together with the inner projection of the horizontal lugs Z Z, will prevent further rise of the valve I when it is being used as a lift-valve.

The upper side of the valve I is provided

with two overhanging lugs, A', placed upon opposite sides, and the horizontal lugs Z Z are projected from opposite sides of the ribs Y Y, but are diametrically opposite each other, as seen in Fig. 3, and are provided with set-screws B' B', as seen in Fig. 1. These set-screws, when turned down, bear upon the lugs A' A', and hold the valve I firmly down upon its seat when the pump is to be used for forcing water.

Two lugs, C' C', are formed upon opposite sides of each of the lower valves, through which set-screws D' D' pass and enter screw-holes E' E', made in the valve-seats, for a purpose to be hereinafter described.

When it is desired to use the pump as a lift or bilge pump, the discharge-passages F', G', H', and I' are closed by caps or plugs, and the suction-valve D is screwed down tightly upon its seat by means of the set-screws D' D'. Upon the lever O being now operated the cylinder H will ascend, and the upper or lift valve, I, will close and the suction-valve C will open and admit a supply of water to the well or chamber J'. As the cylinder descends the suction-valve C will close and the lift-valve I will rise and admit water to the upper part of the cylinder, from which it is forced outward through the spout K' by a new supply entering through the valveway upon the next stroke of the cylinder.

When it is desired to employ the pump for drawing water from over the side of a vessel, the bilge suction-valve C is screwed down upon its seat and the screws of the valve D are slackened, and a hose connection made with one of the induction-passages F' or H'. Upon the cylinder being operated water will be drawn up into the chamber E, and will flow out through the valve D, the whole action of the pump being the same as that last described.

When it is desired to use the pump as a force-pump, the lower or suction valves are to be set or secured as circumstances may require, and the upper or lift valve, I, is to be moved upon its seat until the lugs A' are beneath the lugs Z on the cylinder H, when the set-screws B' are to be turned down and the valve clamped firmly to its seat. A suitable hose or pipe connection is now to be made with the supply of water, and likewise a suitable connection with the air-chamber L'. Upon the pump being operated water will flow into the pump-well J upon the upward stroke of the now solid-headed cylinder; but upon the down-stroke of the same the fluid contained within the pump-well will be forced into the air-chamber L', from which it may be conducted in a continuous stream to any desired point.

When necessary the upper valve may be easily removed from its seat, thus affording a free

passage for the wrench used in tightening up the set-screws of the suction-valves or admit of their total removal, and by removing the valve of the bilge-pipe free passage may be had for the sounding-rod, thus dispensing with the employment of a "sounding-pipe," as has heretofore been necessary; and, furthermore, by the combination, in a pump of this description, of the chamber E and its suction-valve D, I am enabled to employ a bilge-pump as a clear-water pump, and, in connection with the air-chamber, to force a steady stream to any part of the vessel.

It will be observed that a pump of this construction affords free access to all the valves and operating parts, and while intended especially for ship's use is equally adapted for mining, agricultural, and household use, as it combines all the advantages of a lift and of a force pump, and is easily changed from one to the other, as circumstances may require; and by removing the hinged lever and making a suitable connection with the connecting-link T the pump may be operated directly from any power-producing mechanism.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A compound pump having a reciprocating valve-carrying cylinder provided with vertical valve-guides X X and Y Y, and lugs Z Z, carrying set-screws B' B', in combination with the valve I, having projecting overhanging lugs A', substantially as and for the purpose shown and set forth.

2. In a compound pump, the combination of the casing A, cast in one piece, and provided with a headed rim, J, with the internal reciprocating cylinder or valve-seat H, adjustable valve I, movable lug K, block L, set-screw M, bolt N, lever O, and link T, substantially as described.

3. In a compound pump, the combination of the casing A, having spout K' and lower chamber, J, with the reciprocating cylinder H, lift-valve I, suction-valve C, and pipe B, substantially as shown and described.

4. In a compound pump, the combination of the casing A, having chambers E and J, provided with induction-passages, with the reciprocating cylinder H, lift-valve I, and suction-valve D, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 20th day of October, 1882.

HENRY C. LANGREHR. [L. S.]

Witnesses:

WILMER BRADFORD,
CHAS. E. KELLY.