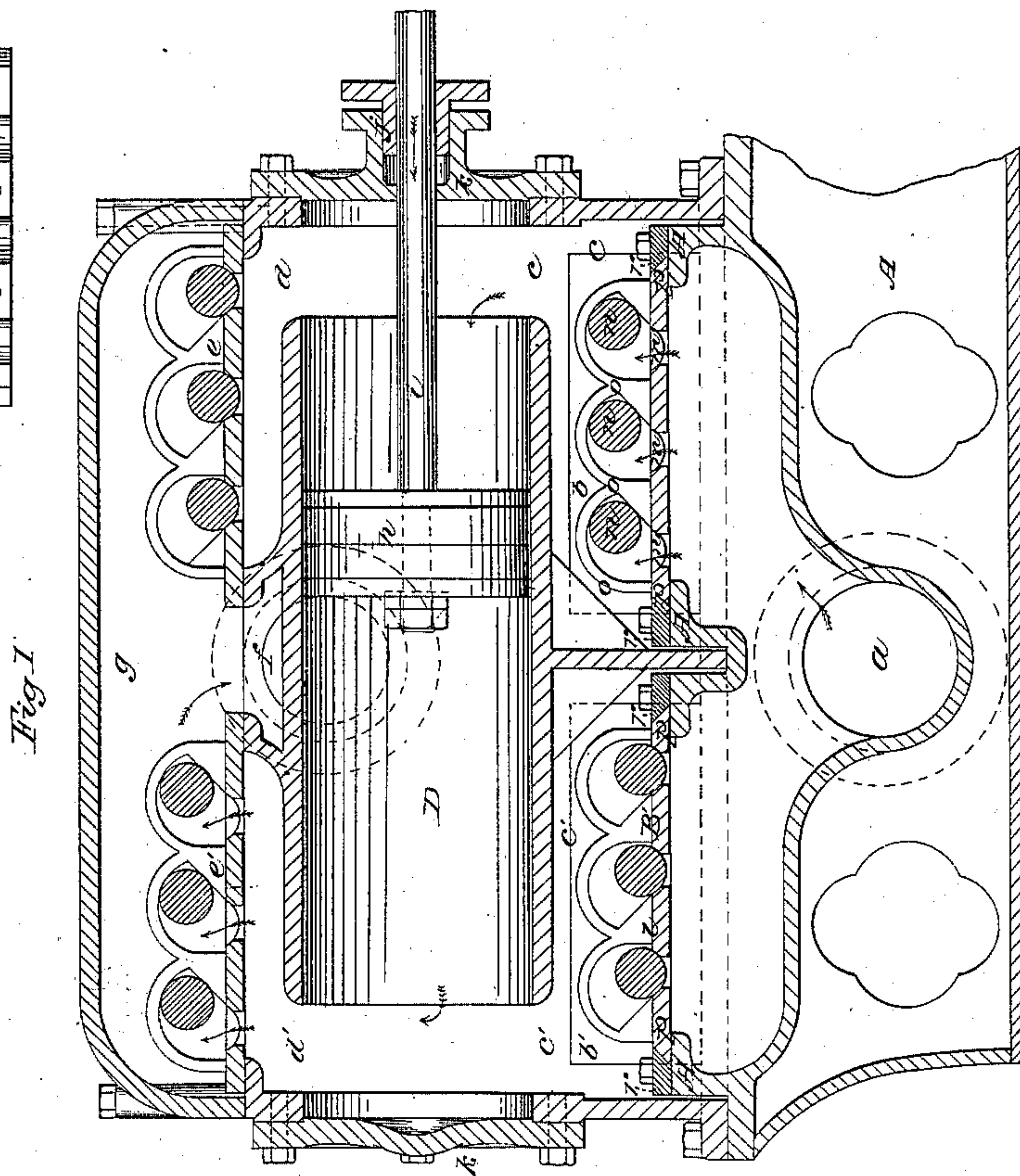
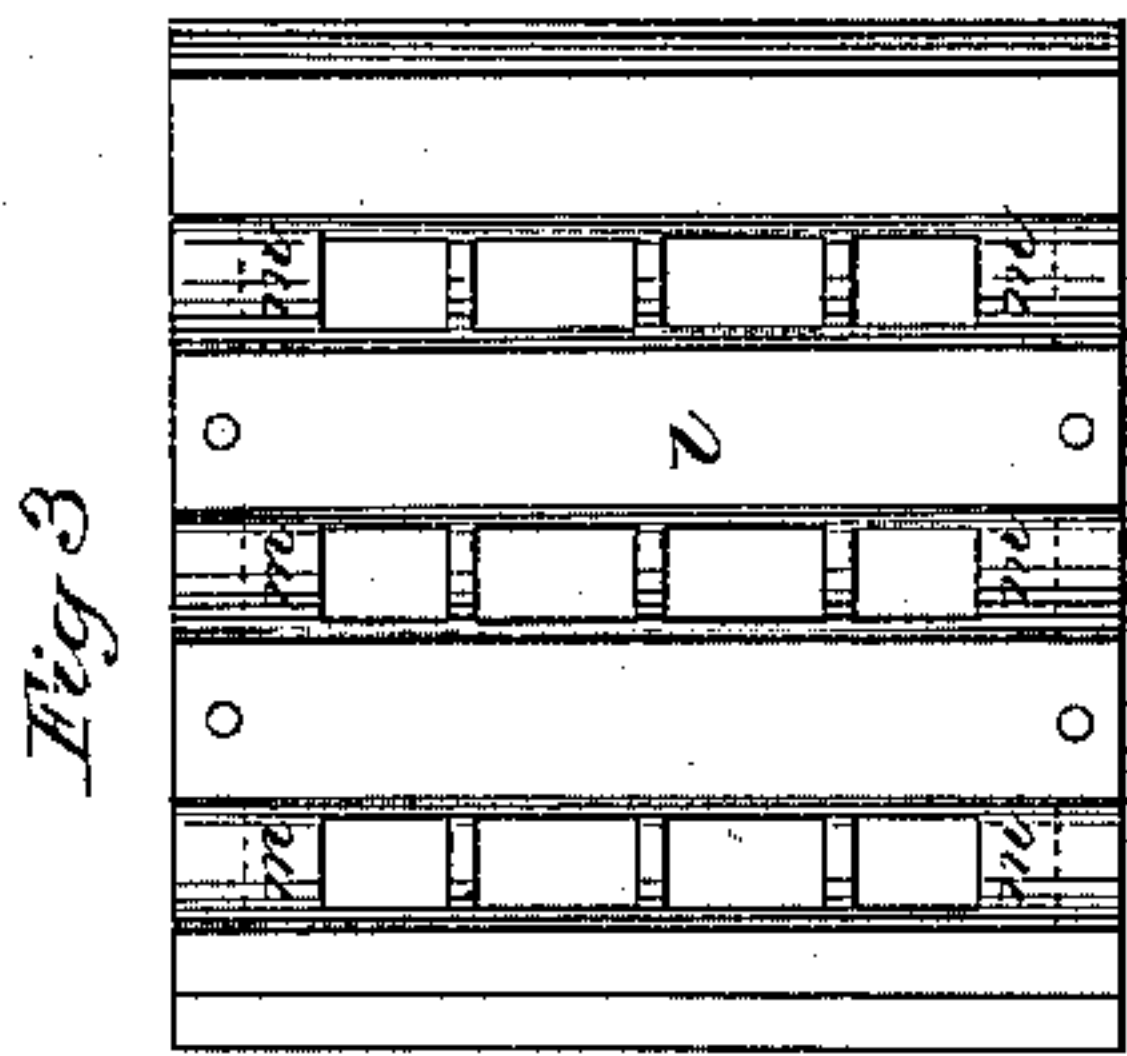
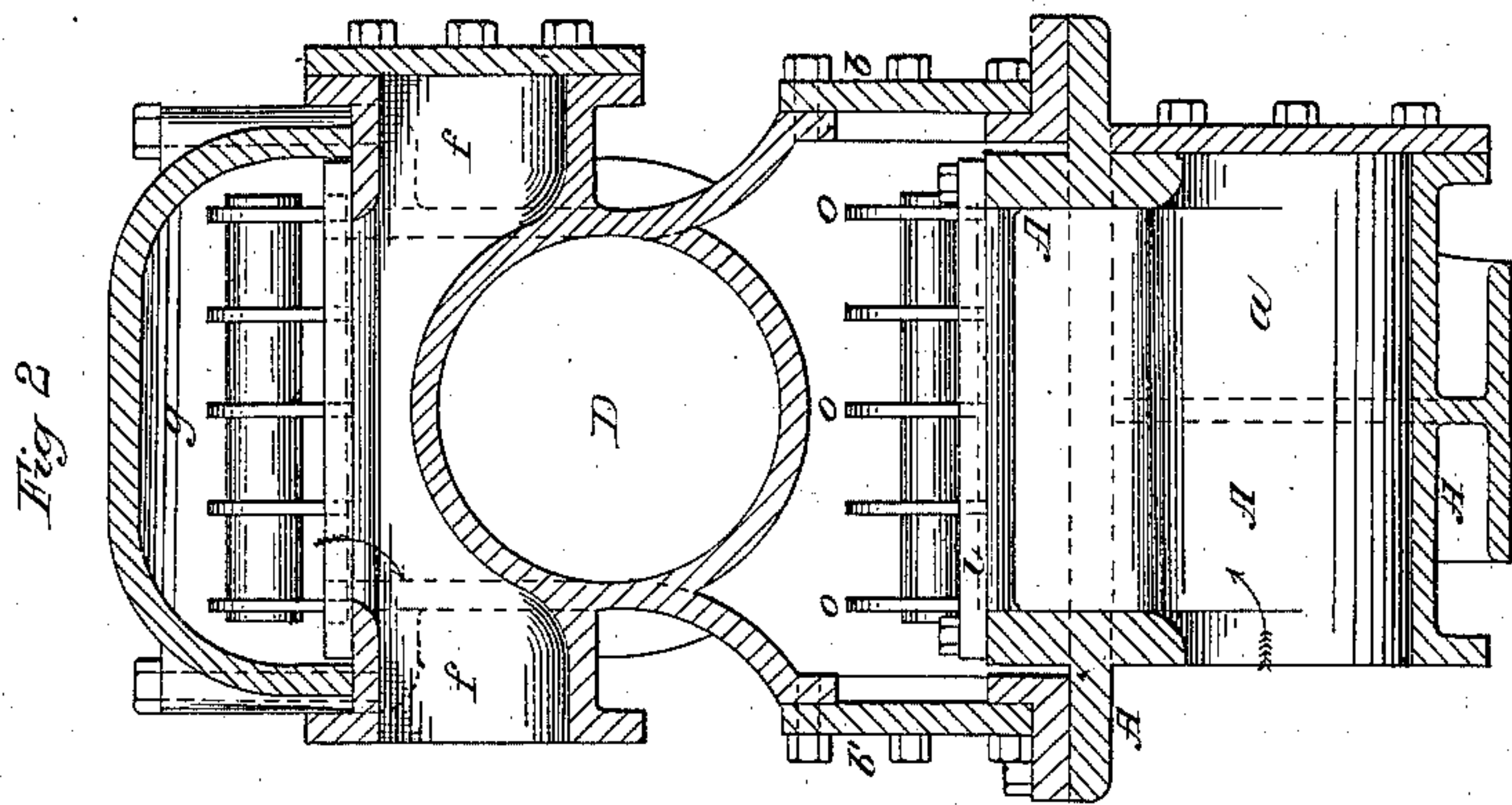


A. M. Perkins,
Steam Pump.

N^o 31,904.

Patented Apr. 2, 1861.



Witnesses:

Milton E. Rippon
Milton Bradley

Inventor:

A M Perkins

UNITED STATES PATENT OFFICE.

ALFRED M. PERKINS, OF SPRINGFIELD, MASSACHUSETTS.

PUMP.

Specification of Letters Patent No. 31,904, dated April 2, 1861.

To all whom it may concern:

Be it known that I, ALFRED M. PERKINS, of Springfield, in the county of Hampden and Commonwealth of Massachusetts, have
5 invented a new and useful Improvement in Steam-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates entirely to that part
10 of the pump known as the water cylinder, consisting of the cylinder proper, and the valves necessary to constitute the pump itself, without regard to the source from which is derived the power to operate the
15 piston, and is confined to two points to a certain extent independent of each other. First the construction of the valves, and secondly the general construction of the cylinder, with regard to the arrangement of the
20 valves and valve chests for the suction valves, and the manner of removing and replacing the valves in case of repairs.

In the drawings accompanying these specifications Figure 1, is a longitudinal
25 vertical section, and Fig. 2, a vertical cross section of a cylinder provided with both suction and discharge valves, and all the other parts necessary to constitute the water end of a working pump. Fig. 3 is a top view of
30 the valve seat with the valves removed.

Like letters of reference indicate the same parts in each of the several figures.

A, is a part of the bed piece of the pump, which if extended would serve as support
35 for the steam cylinder, or for the crank shaft which might serve to communicate motion to the piston. The end of bed-piece here shown is so constructed as to serve as a portion of the cylinder, by having the suction pipe *a*, constructed in and form a part
40 of the said bed piece.

B, B', are two sets of suction valves constructed in a manner hereafter described.

C, C', are two valve chests under the cylinder proper, and having the side covers
45 *b*, *b'*, to admit of free access to the valves.

D, is the bore of the cylinder, *e*, *e'*, the suction ports, *d*, *d'*, the delivery or exhaust ports, *e*, *e'*, two sets of exhaust valves, *f*,
50 the delivery pipe, *g*, the cap, *h*, the piston head, *i*, piston rod, *j*, the stuffing box for the same, *k*, *k*, two cylinder heads.

One of the most important features in a pump is its valves, as, if those are not in
55 good order the pump cannot work satisfactorily. The first thing necessary in a

valve is that it shall be water tight, secondly that it shall be durable, but as the valve never lasts as long as the other parts of the pump, it is also desirable that it shall
60 be cheap and simple, that it may be easily replaced when worn out. Another important quality is large water space, *i. e.* a large area of holes for the passage of water through the valve seat, in proportion to the
65 whole space occupied by the valve seat. Now I claim that all these qualities are embodied in my valve to such a degree as to make it a useful invention and a valuable valve. I will now describe its construction
70 more in detail.

l, is the seat which consists of a plate of metal (seen more clearly in Fig. 3) having cylindrical grooves *m*, *m*, in its upper surface, a portion of the bottom of the groove
75 being cut entirely through the plate for the passage of the water.

n, *n*, *n*, are cylinders of metal, india rubber, or other suitable substance which just fit into these grooves, and when pressed down
80 by the weight of the water form a water tight joint.

o, *o*, &c., is a cage attached to the top of seat *l*, to hold the valves *n*, *n*, from being thrown out of place. As the water presses
85 up from beneath the cylindrical valve is raised until it comes in contact with the cage *o*, *o*, which holds it in place till the pressure of water is removed and it then falls back to its place again.
90

Now one of the greatest difficulties to be overcome in constructing a water cylinder, is to get good water room, *i. e.* to have room to make the ports large enough so as not to
95 cramp the water in passing through and thereby waste much of the power. And in the usual form where the valves are all put on the top of the cylinder it is almost impossible to get room enough without making the cylinder look very much out of proportion.
100

To obviate that difficulty some have placed the suction valves under the cylinder as I have done, but then it was necessary to remove the cylinder whenever the valves
105 needed to be repaired. The object of this arrangement therefore is to place the suction valves under the cylinder and at the same time be enabled to remove and replace the valve seat without breaking the joint of the cylinder with the bed piece. On each
110 side of the valve chest is a cover *b*, *b'*, which gives free access to the valves.

The edges of the valve seat are beveled at p, p , and some strips of metal r, r , are beveled exactly to fit. Now having ground the valve seat l to a fit on the seat A , I lay it on in its place and bolt these strips on, to A , placing them against the valve seat enough to form a good fit, which is easily done by elongating the bolt holes in r, r , a little in the direction of the axis of the cylinder. To hold the seat l , more firmly in its place it can be bolted down by a flange on each side as these bolts can be reached from each side when the covers are removed. Thus after the strips r, r , are bolted on in their proper places, the cylinder may be bolted down to the bed piece and remain so, without the necessity of disturbing it if the valves should get out of repair, as all that would be necessary would be to remove the covers b, b , slip out the valve seat and when repaired, slide it into its place, and bolt on the covers.

The direction of the movement of the piston and consequently of the water is shown by the arrows, which also show the operation of the valves so plainly that any more description is useless. And I will merely remark that although as before stated the cylindrical valve may be made of metal or other substances, yet in a majority of situations the most suitable substance would be india rubber, which being elastic easily conforms to any wearing away of the seat or to any foreign substance that might prevent the working of valves made of other substances, successfully, as the valve is per-

fectly free to rise and fall as it may by chance, it will be continually presenting new wearing surface to the seat, and therefore will wear its whole surface equally.

Now having fully described the construction and operation of my invention, I do not claim the construction of a valve composed of a cylinder and its suitable seat or casing, when the operation of opening and closing said valve is effected by means of the revolution of the cylinder on its axis, when such revolution is produced by some other force than the direct pressure, on the valve cylinder, of the fluid being regulated, as such an arrangement is common in the spigot faucet and other devices, but

What I do claim as new and desire to secure by Letters Patent is—

1. The construction of a valve as described, and composed of a cylinder fitting into a corresponding groove, in a suitable seat, the operation of opening and closing being performed by the rising of the cylinder out of, and the falling of the same into the groove as aforesaid, when constructed and operated substantially as herein described.

2. The combination of a movable valve seat with the valve chests, and covers b, b , when situated under the cylinder substantially in the manner herein set forth.

A. M. PERKINS.

Witnesses:

STEPHEN E. SEYMOUR,
MILTON BRADLEY.