

(No Model.)

H. JONES.
PUMP.

No. 528,436.

Patented Oct. 30, 1894.

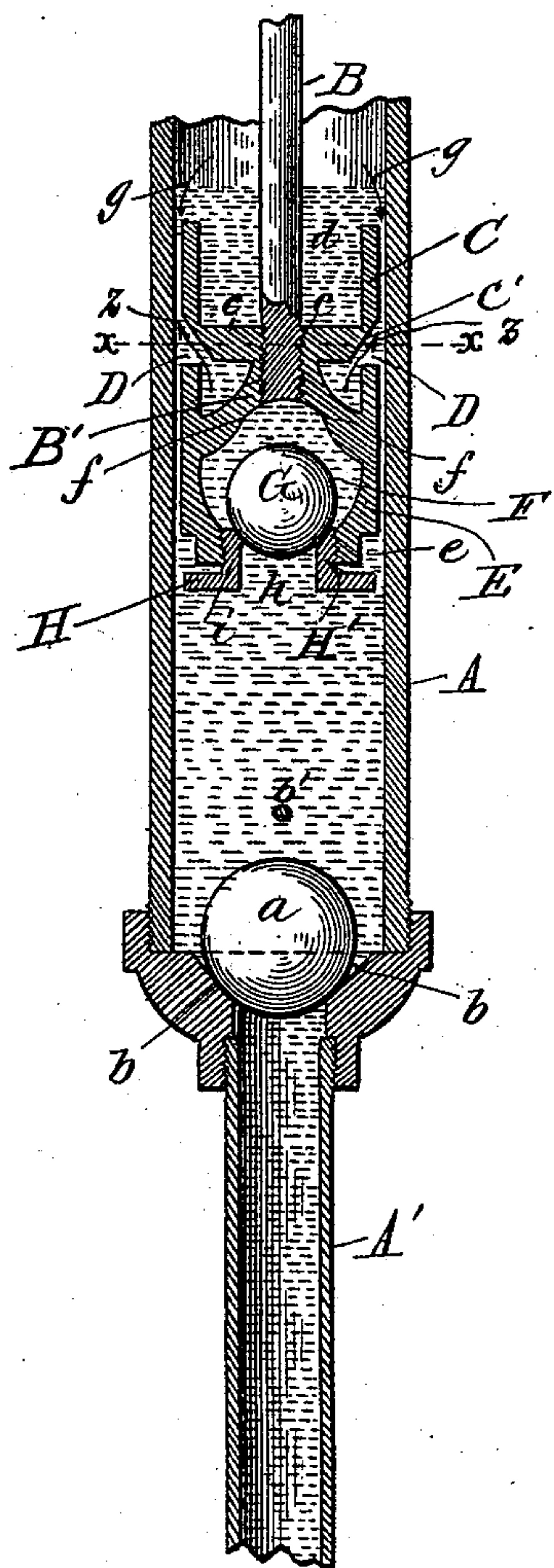


Fig. 1.

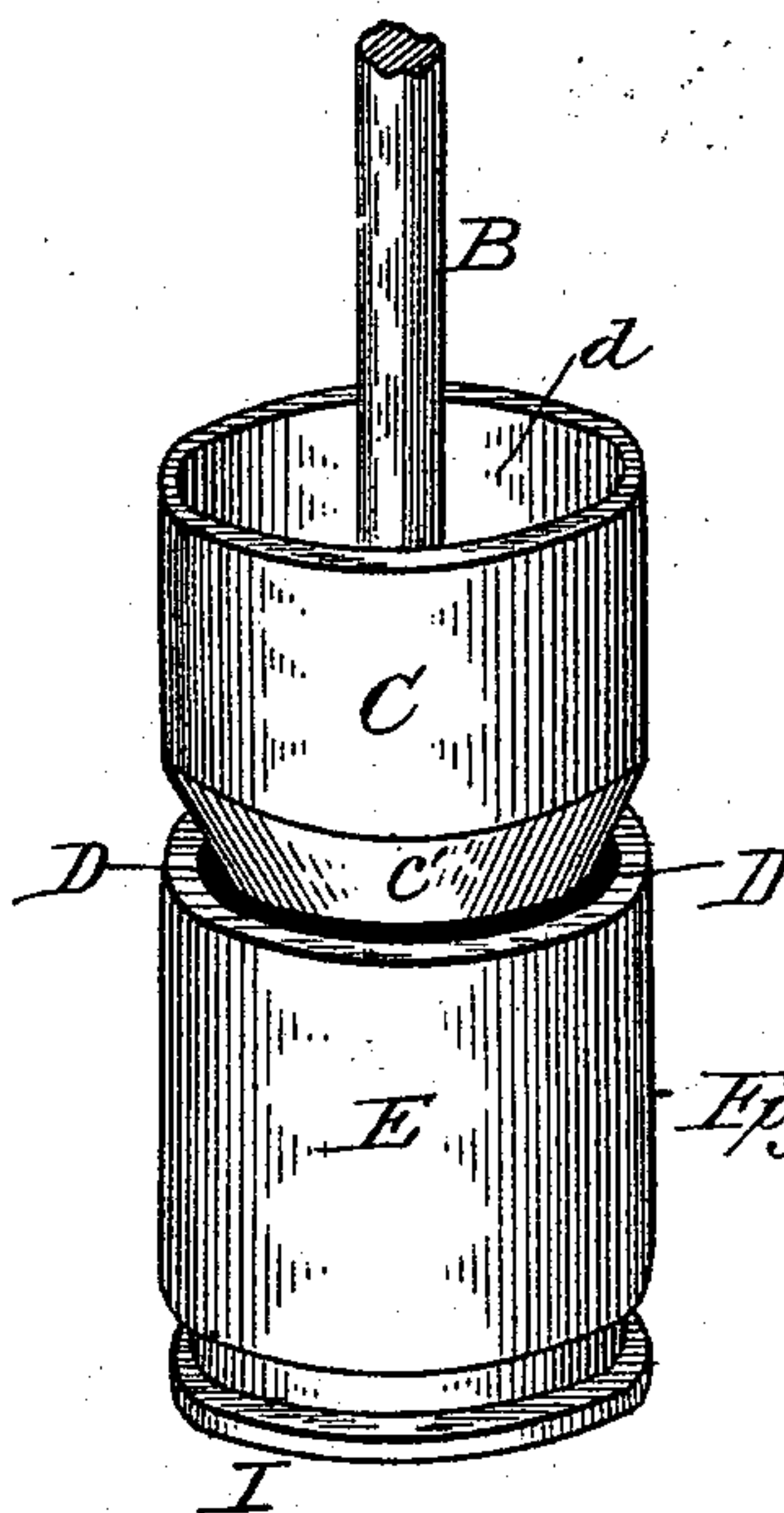
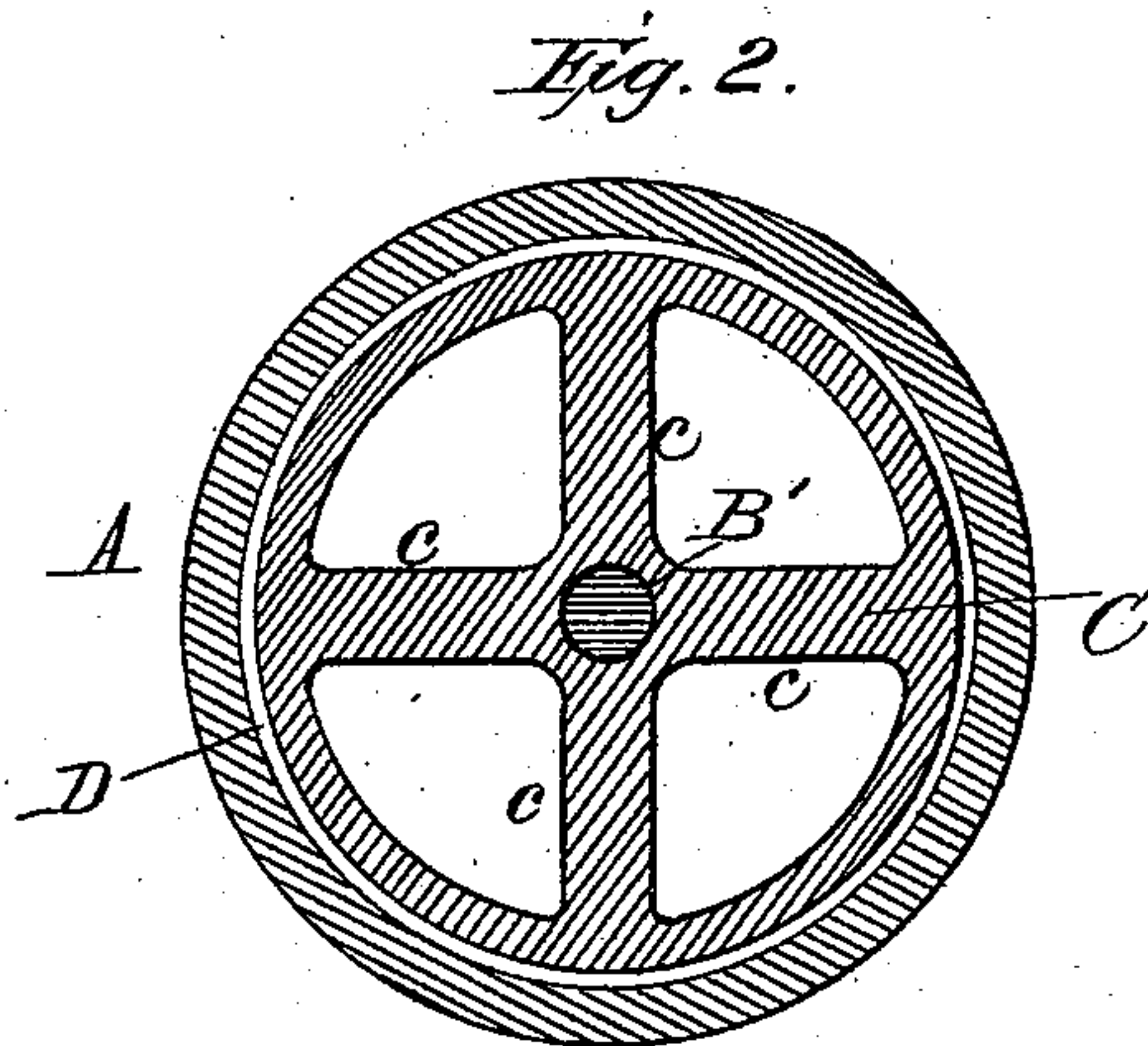


Fig. 3.

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UNITED STATES PATENT OFFICE.

HARRY JONES, OF RICHMOND, INDIANA.

PUMP.

SPECIFICATION forming part of Letters Patent No. 528,436, dated October 30, 1894.

Application filed March 19, 1894. Serial No. 504,267. (No model.)

To all whom it may concern:

Be it known that I, HARRY JONES, a citizen of the United States, and a resident of Richmond, in the county of Wayne and State of Indiana, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a longitudinal sectional view, on a vertical plane, of a pump embodying my improvement. Fig. 2 is a transverse sectional view of the same, on the horizontal plane indicated by the broken line marked $x-x$; and Fig. 3 is a perspective detail view of my improved plunger, removed from the pump barrel.

Like letters of reference designate corresponding parts in all the figures.

This invention relates to pump pistons or plungers adapted, alike, to lifting pumps and force pumps, both "double" and "single acting;" the accompanying drawings illustrating my invention as applied to a single acting lifting-pump; and my improvement has for its object to construct a self-packing or water packing plunger in such a manner that I obtain, on each up-stroke of the plunger, a continuous annular sheet or body of water (or other fluid medium in which the pump works) which, by passing up from and through an annular opening in the body of the plunger against the adjacent side of the inclosing pump barrel, will provide a perfect water-packing; substantially as will be hereinafter more fully described and claimed.

On the accompanying drawings, the letter A denotes the pump-barrel, which has the usual downward extension or suction pipe A', reaching down to the bottom of the well or cistern in which the pump is placed, and is provided at the point of connection between the barrel A and pipe A', with a valve seat b and valve a , which may be of any approved construction and forms no part of my present improvement.

The sucker-rod, or piston-rod, is shown at B, and has its screw-threaded lower end screwed

into the bottom of the upper section C of my improved two-part plunger. This upper part or section C is in the nature and shape of a cylindrical bucket, open at the top d , and provided in its bottom with radial arms $c c$, crossing one another at right angles (see Fig. 2), so as to form a central bearing at the point where the arms cross one another, which has a central screw-threaded aperture B' for the insertion and attachment of piston-rod B; thus forming four openings between the arms and the walls of the plunger. The lower part of this, in alignment with the arms $c c$, is beveled on the outside, as shown at c' , for the purpose hereinafter set forth. The lower part or section of the plunger consists also of a cylindrical bucket E, of the same diameter of the upper bucket C; but reduced or recessed at its bottom so as to form a circular recess e . On the inside, this lower bucket E is of the peculiar construction shown more clearly in Fig. 1; that is to say, its cylindrical wall is provided on the inside with four radial curved arms f , which converge in an upward direction and are connected at their converging upper ends to the under side of the center of the "spider" or open bottom formed in the lower part of the upper bucket C by its arms $c c$, so that the buckets C and E will be connected to each other, and to the piston-rod B, by means of the curved arms $f f$ appertaining to the lower bucket, and straight radial arms $c c$ forming the open bottom of the upper bucket. Below these inside arms $f f$, the lower part of bucket E is made with gradually thickened walls forming the concave valve-cage F, within which plays the spherical valve or ball-valve G. Below this valve in the concave bottom which forms the lower contracted part of the cage, is a circular interiorly threaded aperture h , into which is screwed the exteriorly-threaded collar H' of an annulus H, the circular rim of which projects beyond the circular recess or groove e in the underside of the bucket, so as to close this recess on the under side and thus form an annular groove or channel encircling the lower end of the bottom section E. Thus it will be observed that the play of the ball-valve G is limited or confined, within its cage F, between the concave apertured bottom of the same, on the under side, and the converging

deflected arms *ff* on the upper side, so that when the valve is in the "down" position on its seat, as shown on the drawings, the aperture or inlet, *h* to the valve-cage will be closed.

5 This play of the ball-valve *G* within its cage may be regulated in a measure, by adjusting (*i. e.*, screwing up or down) the annulus *H* with its collar *H'*; the beveled upper end or rim of this collar forming the valve seat proper
10 when screwed up above the rim of the interiorly threaded inner aperture *h*; as clearly shown in Fig. 1 of the drawings.

From the foregoing description, taken in connection with the drawings, the operation
15 of my improved pump will readily be understood. The plunger should be of such diameter, in both its upper and lower sections *C* and *E*, that it will work easily in the pump barrel without friction, or with a minimum of friction; and, by the construction and arrangement
20 of the radial arms *c* and *f* it will be observed that the annular aperture *D*, formed between the slanting or beveled under side *c'* of the top section *C*, and the upper circular rim of the bottom section *E*, is clear or unobstructed
25 all around the plunger, while the circular bottom chamber *e* is also left clear, continuous and without packing. Now, on the up stroke of the plunger in its barrel *A*, water enters
30 the pump barrel through the suction-pipe *A'* and its valve and valve-seat *a*, *b*, and on the return or down-stroke, the water (or other liquid) with which the barrel is filled enters the plunger through its bottom valve. On
35 the next up-stroke, the pressure of the water above the plunger causes a film of water to be forced from the top, above the rim of bucket *C*, down into the narrow cylindrical space between the plunger and pump barrel,
40 as indicated by the darts marked *g g* and by the continued motion of the plunger in the same (upward) direction, the resistance or pressure of the column of water above and within the bucket *C* will cause an outflow of
45 water under pressure through the annular

orifice *D*, which, due to the bevel or incline *c'*, will be thrown in an upward oblique direction against the inner adjacent sides of the pump barrel, as indicated by the darts marked *z*. At this point the two currents of
50 water meet, forming a compact compressed water cushion or packing between the plunger and the pump barrel at a point, or rather on a circular line, intermediate between the top of the upper bucket *C* and the top of the
55 lower bucket *E*, which will extend both in an upward and downward direction, filling the annular dead-water packing space *D* formed by the beveled lower end of the top plunger *C* and the top of lower plunger *E*. This
60 pressure of water which flows upward and outward through the space *D* between the two plungers, will be equally distributed at every point therein, thus centering the plungers or holding them in a vertical position
65 within the pump barrel.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The piston for pumps comprising two
70 hollow cylindrical portions separated by a continuous annular peripheral port and each supported from a point in the axis by an open framework, constructed to allow free passage of water, whereby water is permitted to flow
75 freely from the interior to the exterior of the piston in an annular sheet, as and for the purpose described.

2. The piston for pumps comprising two
80 hollow cylindrical portions connected together internally by radial arms from a portion on the axial line of the two cylindrical portions; substantially as described.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature
85 in presence of two witnesses.

HARRY JONES.

Witnesses:

WM. T. HADEY,
T. C. BYERS.