

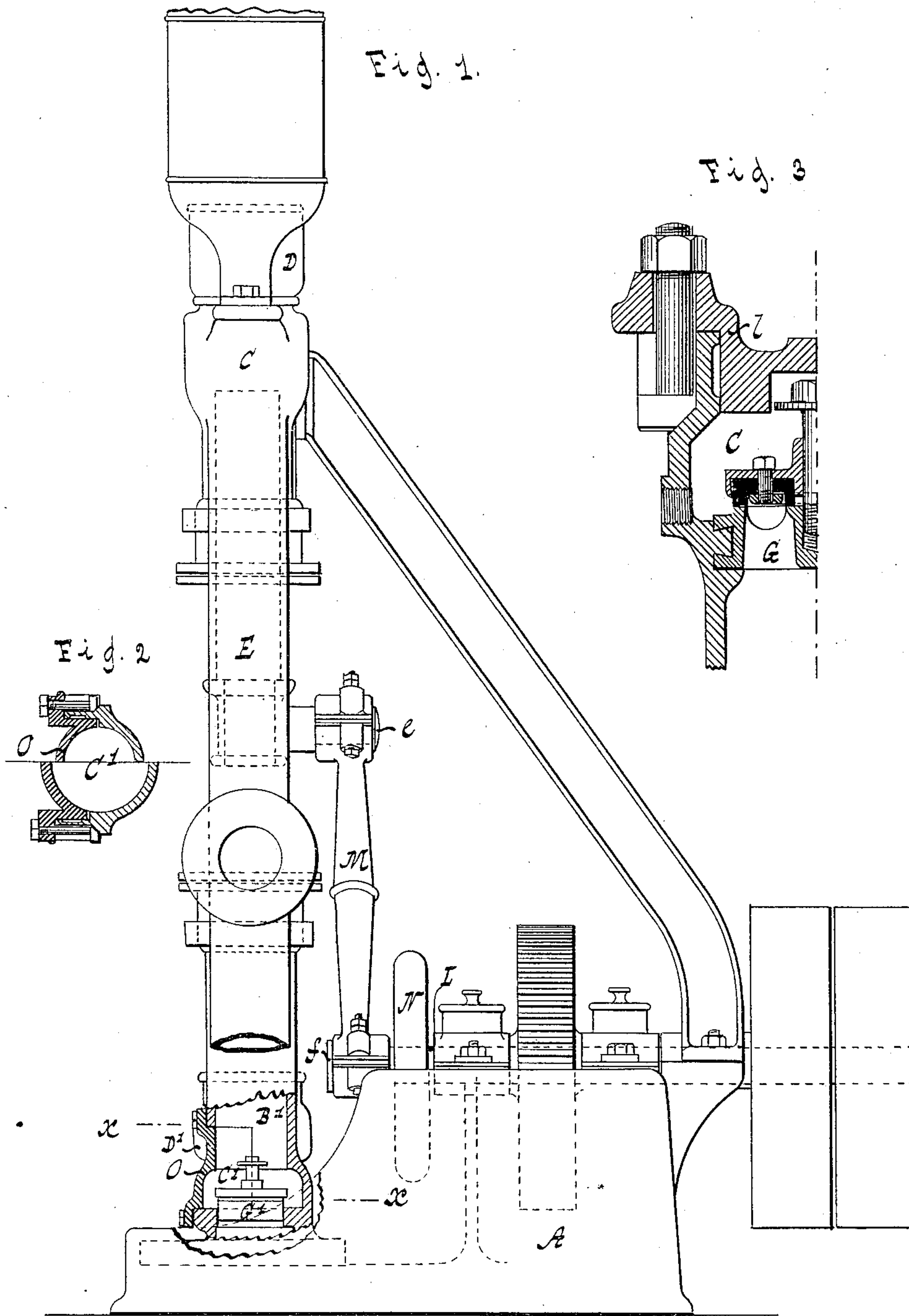
(No Model.)

2 Sheets—Sheet 1.

T. DYSON.
DOUBLE ACTING PUMP.

No. 350,875.

Patented Oct. 12, 1886.



Witnesses:
Abner du Saur Jr.
William Miller

Inventor:
Thomas Dyson.
by Van Santvoord & Hauck
his Attorneys.

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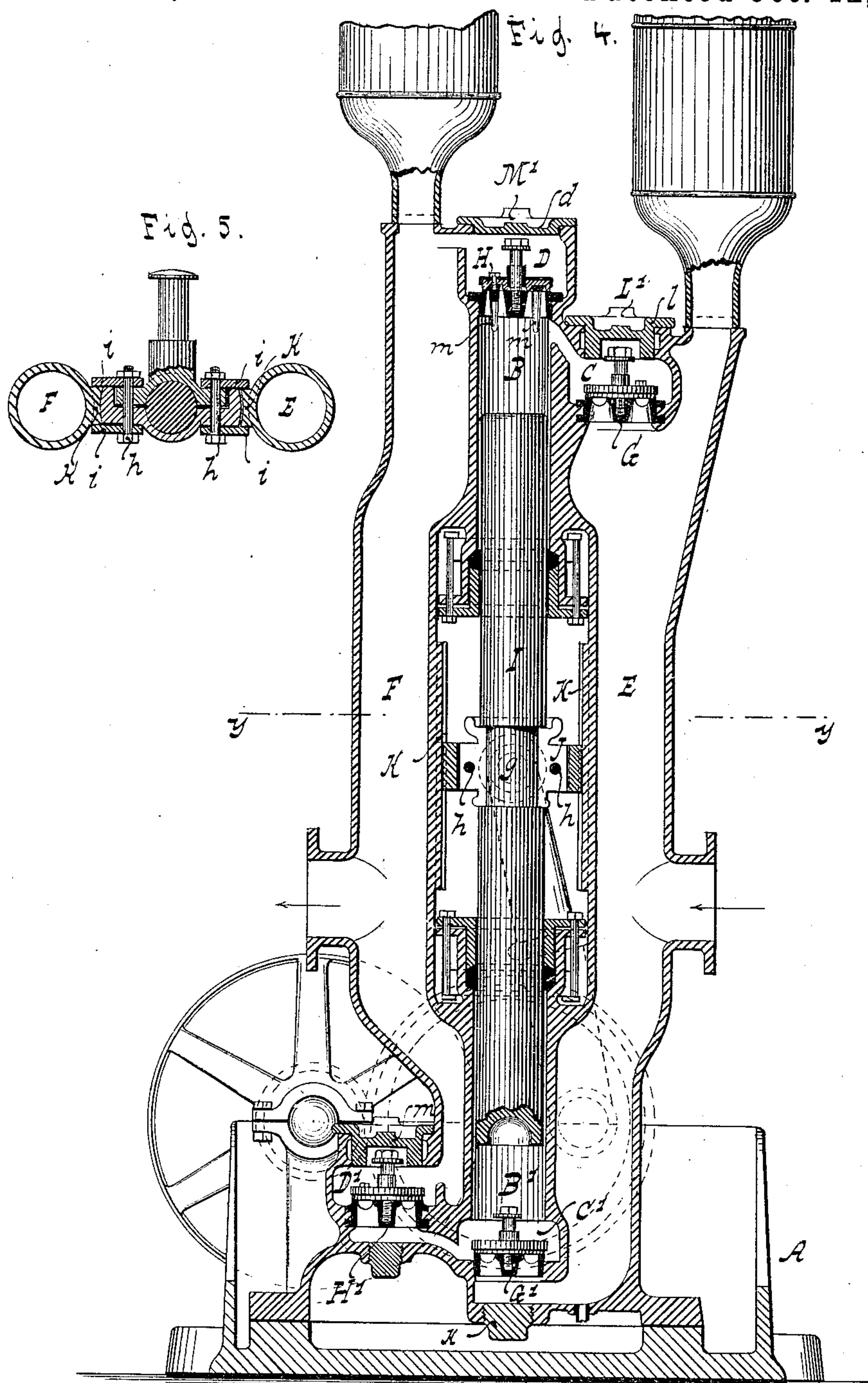
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UNITED STATES PATENT OFFICE.

THOMAS DYSON, OF NEW YORK, N. Y.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 350,875, dated October 12, 1886.

Application filed January 15, 1886. Serial No. 188,670. (No model.)

To all whom it may concern:

Be it known that I, THOMAS DYSON, a citizen of the United States, residing at New York, in the county and State of New York, have invented new and useful Improvements in Double-Acting Pumps, of which the following is a specification.

This invention relates to the double-acting pump of a new construction, as pointed out in the following specification and claims, and illustrated in the accompanying drawings, in which—

Figure 1 represents a sectional side elevation. Fig. 2 is a transverse section in the plane *x x*, Fig. 1. Fig. 3 is a section of one of the valve-chambers on a larger scale than the previous figures. Fig. 4 is a vertical central section of the pump. Fig. 5 is a transverse section in the plane *y y*, Fig. 4.

Similar letters indicate corresponding parts.

In the drawings, the letter A designates a frame which supports the working parts of my pump. In this frame are formed two cylinders, B B', four valve-chambers, C C' and D D', the suction-channel E, and the discharge-channel F.

G G' are the suction-valves, and H H' are the discharge-valves.

I is the plunger, which extends into both the cylinders B B'. The seat for the discharge-valve H is screwed into the outer end or head of the cylinder B, and the valve-chamber D at said outer end or head is provided with a bonnet, *d*, through which access can be had to the valve. By removing the bonnet to the valve H and its seat access can be had to the interior of the cylinder B, so that the plunger I can be introduced.

Between the two cylinders B B' is situated a cross-head, J, which is firmly secured to the plunger I, and which works on parallel guides K K, formed on or attached to the inner adjacent walls of the suction and discharge channels E and F, which channels extend continuously along the two cylinders. This cross-head is connected to the shaft L, to which revolving motion is imparted by any means suitable for the purpose. In the example shown in the drawings the connection between the cross-head and the shaft L is formed by a connecting-rod, M, which connects at one end with a stud, *e*, projecting from the cross-head

J, and at its opposite end with a crank-pin, *f*, projecting from a wheel, N, which is mounted on a shaft, L. When the shaft is set in motion, the reciprocating motion is imparted to the plunger I, and by the cross head J and its guides K the plunger is kept straight, so that it is not liable to bind in its stuffing-boxes or in the cylinders.

In order to obtain a firm connection between the cross-head and the plunger, said plunger is provided with a recess, *g*, and the cross-head is made in two parts which fit the recess *g*, and which are clamped together by bolts *h*. (See Fig. 5.) On the cross head are secured four plates, *i*, which overlap and work against the guides K, and I prefer to make those plates detachable, so that they can be set up if they become worn. The seat of the suction-valve G' is formed in the outer end or head of the cylinder B', and the plug *k* gives access to this valve. The seats of the valves G' and H' are, by preference, cast into the valve-chambers C and D', (best seen in Fig. 3,) and access can be had to these valve-chambers through bonnets I' and M', respectively.

The valve-chambers C and D' are formed, respectively, as lateral extensions of the outer ends of the two cylinders, and such extensions project in opposite directions.

Access can be had to the valve-chamber C' of suction-valve G' by removing a bonnet, O, which is detachably secured to the cylinder B' and to walls of the valve-chamber, as best shown in Figs. 1 and 2.

From the discharge-valve H extend pins *m* into the cylinder B, so that said valve is raised from its seat by the plunger I as the same reaches one end of its stroke.

When the pump is placed in an upright position, as shown in the drawings, the suction-channel E, as well as the discharge-channel F, is in a vertical position. If the pump is quite dry and it is started, it requires some time to get all the air out of the upper portion of the discharge-channel and cylinder; but as the lower cylinder, B', draws in water and ejects the same the upper portion of the discharge-channel F, and also the valve-chamber D, becomes filled with water, and when the valve H is lifted by the action of the plunger I against the pins *m* the water enters the valve-chamber C and the cylinder B, the air is expelled

from these spaces, and on the next downstroke of the plunger I water is drawn in through the valve G.

I am aware that a double-acting pump has heretofore been constructed with two cylinders arranged in line, a piston in each cylinder connected together by a piston-rod, and devices connected with the rod between the cylinders to reciprocate said rod. Such, therefore, I do not broadly claim.

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

1. The combination, in a double-acting pump, of a supporting-frame, A, two cylinders, B B', arranged in line and carried by the frame, and each provided at its outer end with a valve-chamber containing a valve in line with the bore of the cylinder, one of which valves is positively operated, the suction and discharge channels E and F, extending, respectively, along the opposite sides of both cylinders and provided at their inner adjacent walls, between the inner ends of the cylinders, with parallel guides K, a cross-head, J, movable on said guides between the cylinders and channels, a plunger, I, extending into both cylinders and connected with the cross-head, and a driving-shaft connected with said cross-head, substantially as described.

2. The combination, in a double-acting pump, of a supporting-frame, A, two cylinders, B B', arranged in line on said frame, and each provided at its outer end with a valve-chamber containing a valve in line with the bore of the cylinder, and with a laterally-projecting valve-chamber containing a valve, one of the valves in line with the cylinder-bore being positively operated, the suction and discharge channels E and F, extending, respectively, along the opposite sides of both cylinders and provided at their inner adjacent walls, between the inner ends of the cylinders, with parallel guides K K, a cross-head movable on said guides between the cylinders and channels, a plunger, I, extending into both cylinders and connected with the cross-head, and a driving-shaft connected with the cross-head, substantially as described.

3. The combination, in a double-acting pump, of a frame, A, two cylinders, B B', arranged in line on said frame, and each provided at its outer end with a valve-chamber and valve in line with the bore of the cylinder, the suction and discharge channels E and F, extending, respectively, along the opposite sides of both cylinders and provided at their inner adjacent walls, between the inner ends of the cylinders, with parallel guides K K, a plunger, I, extending into both cylinders and provided centrally with a recess, g, the cross-head J, composed of two sections clamped upon the plunger and entering said recess and movable on the guides between the cylinders and channels, and a driving-shaft connected with the cross-head, substantially as described.

4. The combination, in a double-acting force-pump, of a frame, A, two cylinders, B B', arranged in line on said frame, and each provided at its outer end with a valve-chamber and valve in line with the bore of the cylinder, and with a laterally-extending valve-chamber containing a valve, the suction and discharge channels E and F, extending, respectively, along the opposite sides of both cylinders and provided at their inner adjacent walls, between the inner ends of the cylinders, with parallel guides K K, a plunger, I, extending into both cylinders and provided centrally with a recess, g, a cross-head, J, composed of two sections clamped to the plunger and entering the recess, said sections moving on the edges of the guides, plates i, secured, respectively, to the sections of the cross-head and overlapping the opposite sides of the guides, and a driving-shaft connected with the cross-head, substantially as described.

In testimony whereof I have hereunto set my hand and seal in the presence of two subscribing witnesses.

THOMAS DYSON. [L. S.]

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.