

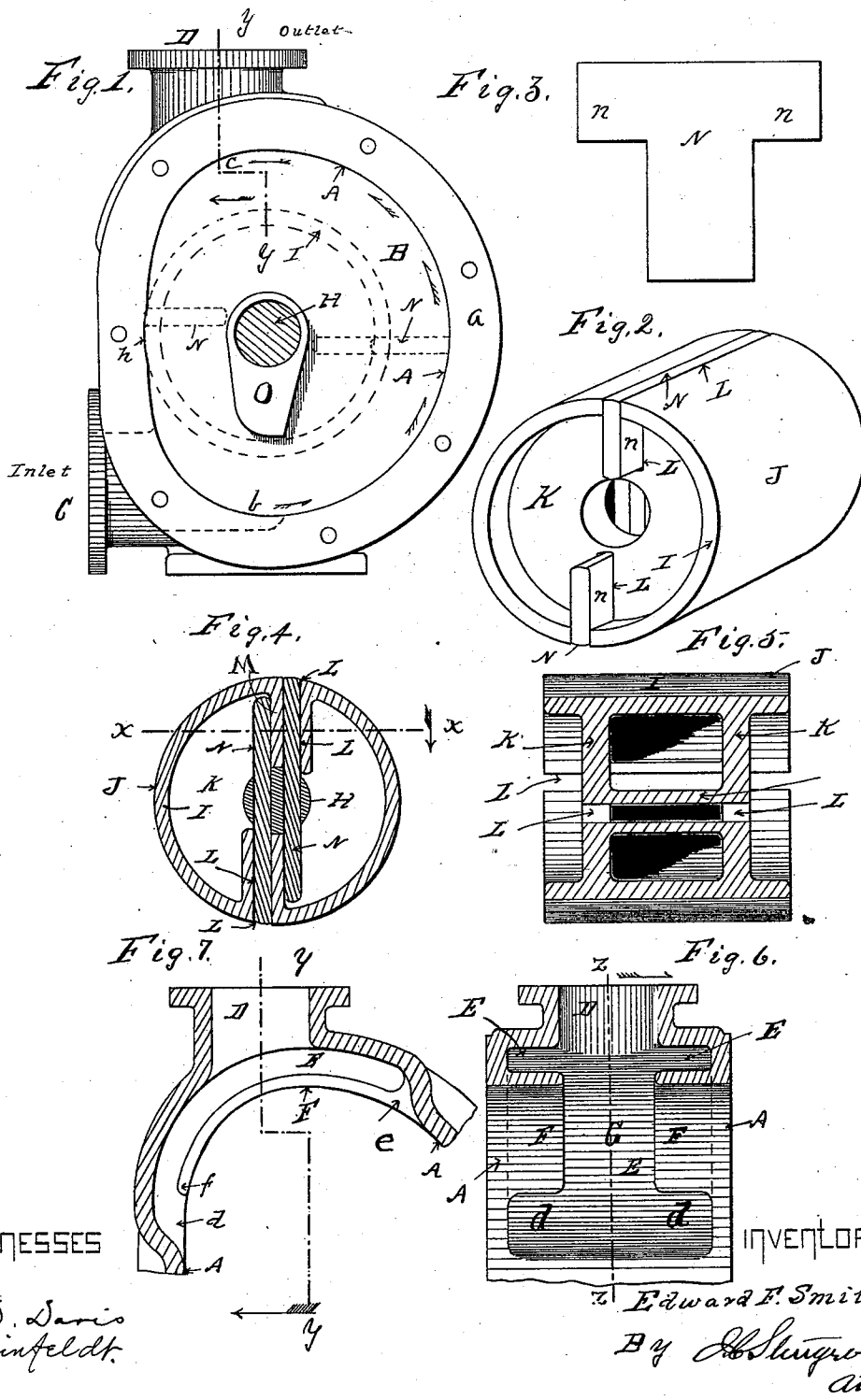
(No Model.)

2 Sheets—Sheet 1.

E. F. SMITH.
ROTARY PUMP.

No. 527,082.

Patented Oct. 9, 1894.



WITNESSES

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INVENTOR

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(No Model.)

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Fig. 9.

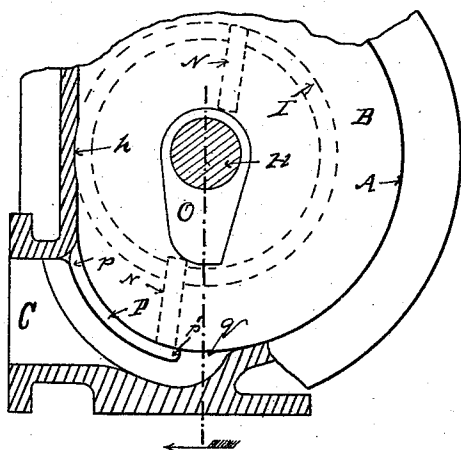
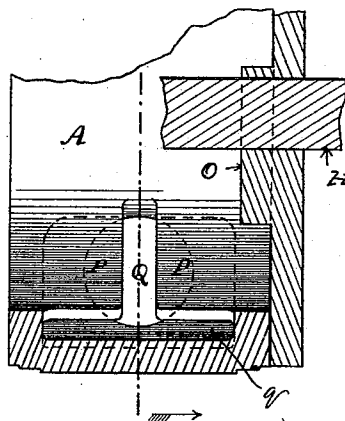


Fig. 8.



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UNITED STATES PATENT OFFICE.

EDWARD F. SMITH, OF ERIE, PENNSYLVANIA.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 527,082, dated October 9, 1894.

Application filed March 16, 1893. Serial No. 466,375. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. SMITH, a citizen of the United States, residing at the city of Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Rotary 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, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention consists in the improvements in rotary pumps hereinafter set forth and explained and illustrated in the accompanying drawings, in which—

Figure 1 is an end view in elevation of the shell of my improved rotary pump with one head and the rotating cylinder and valves carried thereby removed. Fig. 2 is a perspective view of the rotating cylinder of my improved rotary pump, with the valves therein. Fig. 3 is a view in elevation of one of the valves removed from the rotating cylinder of my improved rotary pump. Fig. 4 is a transverse section of the cylinder of same. Fig. 5 is a longitudinal section of the rotating cylinder of my improved rotary pump, with the valves removed therefrom, on the line *x, x*, in Fig. 4, looking in the direction of the arrow. Fig. 6 is a vertical section of a portion of the shell of my improved rotary pump, on the line *y, y*, in Figs. 1 and 7, looking in the direction of the arrow. Fig. 7 is a vertical transverse section of a portion of the shell of my improved rotary pump on the line *z, z*, in Fig. 6, looking in the direction of the arrow. Fig. 8 is a longitudinal section of the lower part of the shell of my improved rotary pump, on the line *y, y*, in Figs. 7 and 9, looking in the direction of the arrow. Fig. 9 is a transverse section of the same on the line *z, z*, in Figs. 6 and 8, looking in the direction of the arrow.

In the construction of my improved rotary pump illustrated in the accompanying drawings, A is the shell of the pump, provided with removable heads B bolted to flanges *a* on the ends of the shell in the usual manner. The shell A is provided with an inlet C, the bottom of which is horizontally a little below the

bottom of the inside of the shell, and with an outlet or discharge opening D at the top of the shell.

In the upper part of the shell A directly under the discharge opening D, I make chambers E, the under surfaces of which are formed by annular projections or lips F, F, which are secured to and form part of the periphery of the shell A; these projections or lips F being, however, separated some distance from each other, so as to leave an opening G between them, as illustrated in Fig. 6, the ends *e* of these annular projections or lips extending to and forming part of the periphery of the shell A, while the ends *f* thereof are cut away, so as to leave a longitudinal or T shaped opening *d*, as illustrated in Figs. 6 and 7. The inlet C of the shell A, is also provided with annular projections or lips P, P, which are secured to and form part of the periphery of the shell A, these annular projections or lips P being however, separated some distance from each other, so as to leave an oblong opening Q between them, as illustrated in Fig. 8, the ends *p* of these projections or lips extending to and forming part of the periphery of the shell A, while the ends *P'* thereof are cut away, so as to leave a longitudinal or T shaped opening *q* for part of the inlet of the pump as illustrated in Figs. 8 and 9. These lips or projections F, F, over the sides of the outlet, and P, P, over the sides of the inlet of the pump, perform two functions, one of which is to present greatly enlarged wearing surfaces to the peripheries of the radially moving valves, and another is to provide discharge and inlet openings which are elongated, so as to gradually relieve the strain upon the valves during their inward and outward traverse, which these features accomplish in a most satisfactory manner, thereby contributing largely to the efficiency and durability of the pump.

Eccentrically within the shell A, I mount the shaft H, of a rotary cylinder I, which cylinder I contacts with one side of the shell A, a slight depression *h* being turned therein to fit the periphery of the cylinder I, so as to form a joint sufficiently tight to substantially prevent the passage of the fluid being pumped, as illustrated in Fig. 1. The shell J of the cylinder I projects some little distance beyond the heads K forming the ends thereof,

so as to contact with the heads B of the shell A. Through this cylinder, I cut two longitudinal slots L, L, which are separated by a diaphragm M, this diaphragm operating to
 5 completely cut off the leakage from one side of the cylinder to the other when the pump is in operation. These slots L are preferably parallel to each other, and extend, one,
 10 through one side of the shell J of cylinder I, and the other through the opposite side of the shell on the opposite sides of the diaphragm M. These slots L, L, extend through the shaft H, as illustrated in Fig. 4, or may,
 15 if desired be placed farther apart, so that the sides of the shaft need only be slightly flattered to clear them. These slots L, L, also extend down through the heads K of the cylinder I, some distance, as and for the purpose set forth.

20 In the slots L, L, in the cylinder I, I place flat T shaped valves N (shown in Fig. 3), which slide freely in and out therein, the portions *nn* of the valves N projecting outward through the slots L, L, in the heads K of the cylinder I
 25 flush with the ends of the shell thereof.

On the heads B, B, of the shell A, I secure cams O, O, which extend within the recesses, formed by the projections of the ends of the shell J of the cylinder I, beyond the heads K
 30 thereof; and engage with the projections *nn* on the valves N at each revolution of the cylinder I, and force the valves N outward into contact with the periphery of the shell A, just as they are passing the inlet opening C of the
 35 pump, so that they will engage the fluid being pumped, each valve passing off of the cams O O just as it completes its full outward traverse and from which point the load upon the valves prevents their backward movement in the
 40 slots L in the cylinder I until after they pass the point of discharge at the upper part of the shell A, when the pressure upon them being removed, they readily pass back into the slots L flush with the periphery of the cylinder
 45 I until the point of cut-off *h* is passed, when

they are again engaged and forced outward by the cams O, as the inside of the shell A from the point *b* when the valve has taken its load to the point *c* where the load has been discharged is an arc of a circle, the center
 50 of which is coincident with the center of the shaft H of the cylinder I, so that when the valves are moved out into contact with the inside of the shell A at the point *b*, by the operation of the cams O no further movement
 55 thereof in the slots L is required until after the load has been discharged therefrom, at and before they reach *c*, after which the valves move back easily into the cylinder I.

From the foregoing description of the construction and operation of my improved rotary pump, its construction and operation will be clearly understood by those conversant with rotary pumps.

Therefore, what I claim as new, and desire
 65 to secure by Letters Patent of the United States, is—

The combination in a rotary pump, of a rotating cylinder, consisting substantially of a shell provided with countersunk heads and a
 70 central longitudinal diaphragm, forming a division separating the two halves of said cylinder, a slot at one side of said diaphragm, through one side of the periphery and of the heads of said cylinder, and a like slot at the
 75 opposite side of said diaphragm, through the opposite side of the periphery and of the heads of said cylinder, radially moving valves in said slots extending outward through the slots in the countersunk heads, to the ends of
 80 the cylinder shell, and cams on the heads of the pump shell adapted to be engaged by the ends of the valves during their outward movement only, substantially as set forth.

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

EDWARD F. SMITH.

Witnesses:

F. EINFELDT,

MATTHEW GRISWOLD, Jr.