C. E. FINKLE.

ROTARY FORCE PUMP.

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907,022. Patented Dec. 15, 1908

Fig. 1.

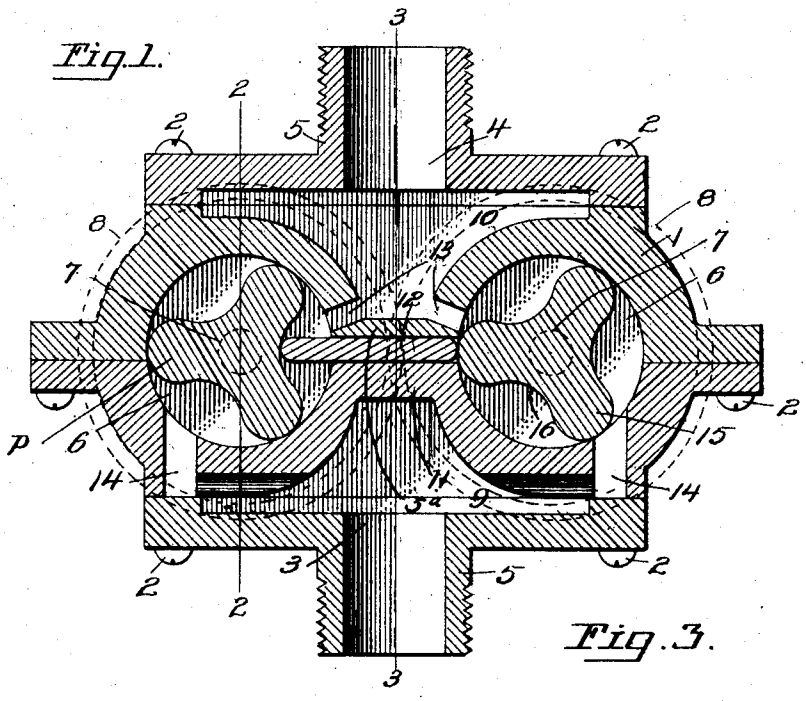
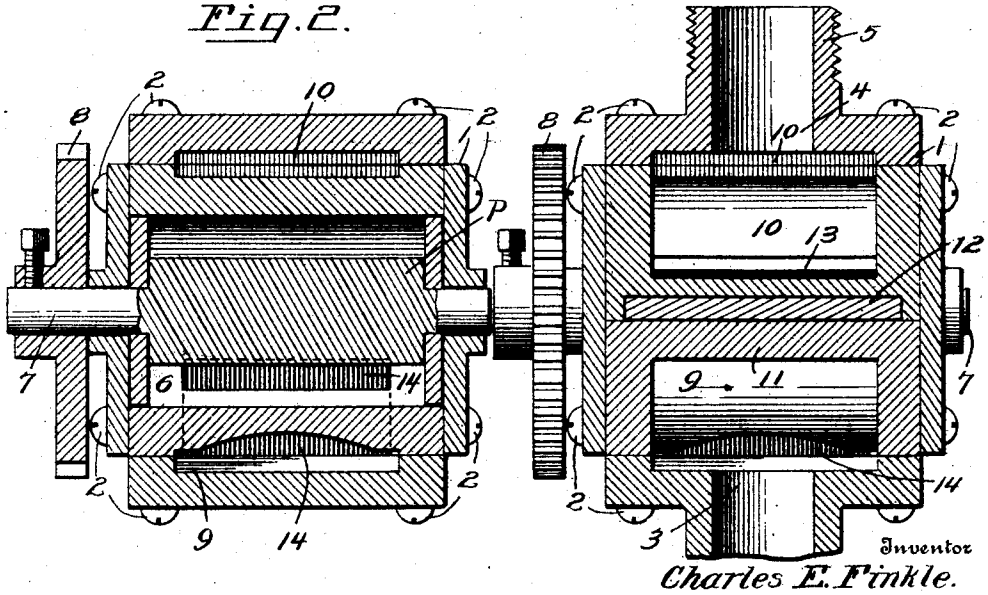


Fig. 3.

Fig. 2.



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Witnesses

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ROTARY FORCE-PUMP.

No. 907,022. Specification of Letters Patent. Patented Dec. 15, 1908.

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To all whom it may concern:

Be it known that I, CHARLES E. FINKLE, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Rotary Force-Pumps, of which the following is a specification.

This invention relates to rotary force pumps of the duplex-piston type, and consists of the features of construction and combination of parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a vertical sectional view of a double piston pump constructed in accordance with the invention. Fig. 2 is a vertical transverse sectional view of the same taken on the plane indicated by the line 2—2 in Fig. 1. Fig. 3 is a vertical sectional view on the plane indicated by the line 3—3 in Fig. 1.

Corresponding parts in the several figures are denoted by like characters of reference.

In the description which is to follow, the terms "upper" and "lower", and other relative terms will be used with reference to a horizontally disposed pump, but it will be understood that the pump may be effectively used in various positions, and that I do not limit myself to a horizontal pump.

The casing of the improved pump, in its various forms, may be suitably constructed of two or more pieces, suitably connected or fastened together by means of bolts 2—2 or other fastening devices. Said casing, which is designated 1, is provided with oppositely disposed openings or apertures constituting respectively an inlet 3 and an outlet 4; that said openings have been shown surrounded by externally threaded flanges 5—5 with which proper pipe connections may be made.

The casing of the double piston pump is provided with internally disposed partitions 5^a and 11 which provide cylindrical chambers 6—6 and chambers or cavities 9 and 10, and the end walls of the casing are provided with bearings for shafts 7 that extend axially through said cylindrical chambers; said shafts being provided with intermeshing gears 8 whereby the shafts, which may be driven in any suitable manner, will be rotated in opposite directions. The chambers or cavities 9 and 10 communicate respectively with the inlet 3 and the outlet 4. The partition 11 has a slot or opening wherein the cut-off or stripping plate 12 is guided for reciprocatory movement, said stripping plate being adapted to be alternately projected into the two chambers 6—6. The partitions 5^a or walls of the cylindrical chambers 6—6 are provided adjacent to the partition 11 wherein the stripping plate is supported with ports 13 communicating with the outlet aperture 4 through the cavity 10; other ports 14 disposed adjacent to the side walls of the casing connect the chambers 6 with the inlet aperture 3 through the cavity 9.

The pistons P which are secured and mounted upon the shafts 7 are of suitable length to fit between the end walls of the casing, and each of said pistons is provided with a plurality of radial wings 15, preferably having rounded or arcuate extremities and separated by curved or arcuate recesses 16; said wings being disposed at equal distances apart, and said recesses being preferably of equal curvature or radius.

In operation, the pump casing may be immersed in the liquid which is to be raised, or said liquid may be introduced into the casing in any suitable manner through the inlet aperture 3. When the piston carrying shafts are rotated in the direction indicated by arrows in Fig. 1 the liquid entering the cylindrical chambers 6 through the cavity 9 and ports 14 will fill the spaces between the lowermost recession 16 of the pistons, and the adjacent walls of the inlet portions of the chambers 6. The piston wings 15 which sweep past the ports 14 will carry the liquid into the upper portions of the chambers whence it is expelled through the exit ports 13 which communicate with the outlet aperture 4 through the cavity 10, the liquid being stripped from the pistons by the action of the cut-off or stripping plate 12 to which latter a reciprocatory movement is imparted by contact with the pistons; the extremities of the stripping plate being preferably rounded, as shown, so that little or no resistance will be caused by friction between the parts. The stripping plate, it will be observed, is disposed upon the axial plane of the shafts 7, and it constantly coöperates with the pistons to establish a partition or separation between the inlet and the outlet portions of the piston chambers.

From the foregoing description taken in connection with the drawings hereto annexed, the operation and advantages of the several parts of this invention will be readily understood by those skilled in the art to

which said invention appertains. The construction of the improved pump is simple and inexpensive; and it may be successfully utilized for the purpose of raising water and other liquids to a considerable height, with relatively slight expenditure of power.

Having thus fully described the invention, what I claim as new is:—

A rotary pump comprising an inclosing casing having a central bottom inlet and a central top outlet, upper and lower sets of segmental partitions integral with the opposite side and end walls of said casing and subdividing the interior thereof into a pair of opposed piston cylinders wholly inclosed within said casing and upper and lower suction and discharge chambers communicating respectively with the inlet and the outlet, a cross partition between the adjacent sides of the lower segmental partitions separating said suction and discharge chambers from each other and provided with a guide slot extending between the piston cylinders, said piston cylinders being provided between the inner ends of the upper segmental partitions and the cross partition with suction ports communicating directly with the suction chamber and discharge ports between the outer ends of the lower segmental partitions and adjacent walls of the casing and communicating directly with the discharge chamber, rotary pistons in said cylinders, each comprising a solid body having a plurality of radiating wings and concavities alternating with said wings, the wings of each piston being disposed for coaction with the concavities of the other piston, and a sliding cut-off mounted to reciprocate in said guide slot between the piston cylinders and to be alternately engaged by the wings and concavities of each piston and alternately reciprocated by said pistons in opposite directions.

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

CHARLES E. FINKLE.

Witnesses:
CHAS. M. HIRSCHFELDER,
BESSIE MILLER.