(No Model.) 2 Sheets—Sheet 1.

B. F. TABER.

ROTARY PUMP.

No. 471,279. Patented Mar. 22, 1892.

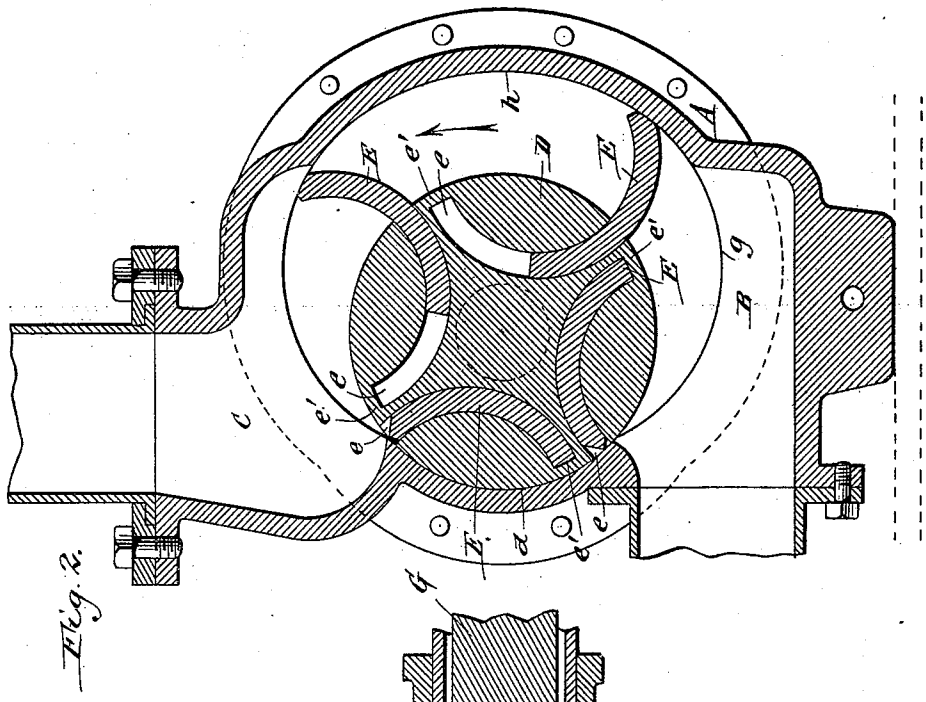

Fig. 2.

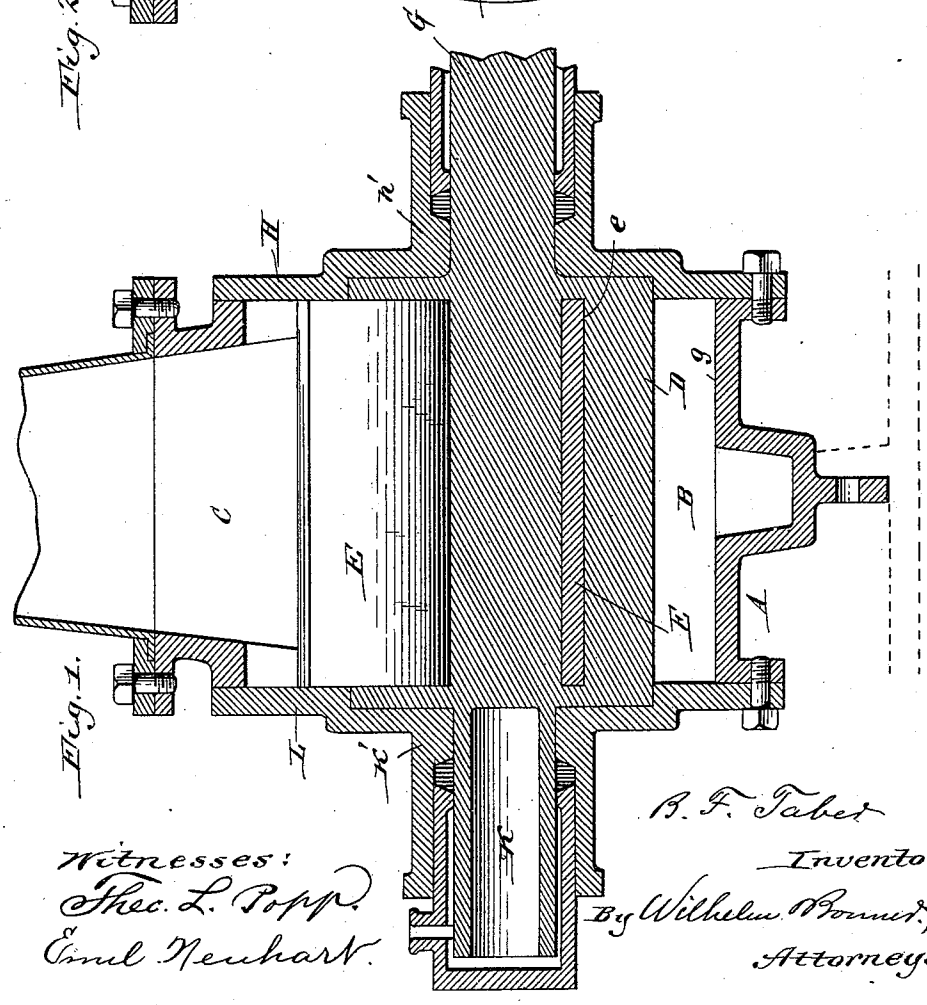

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

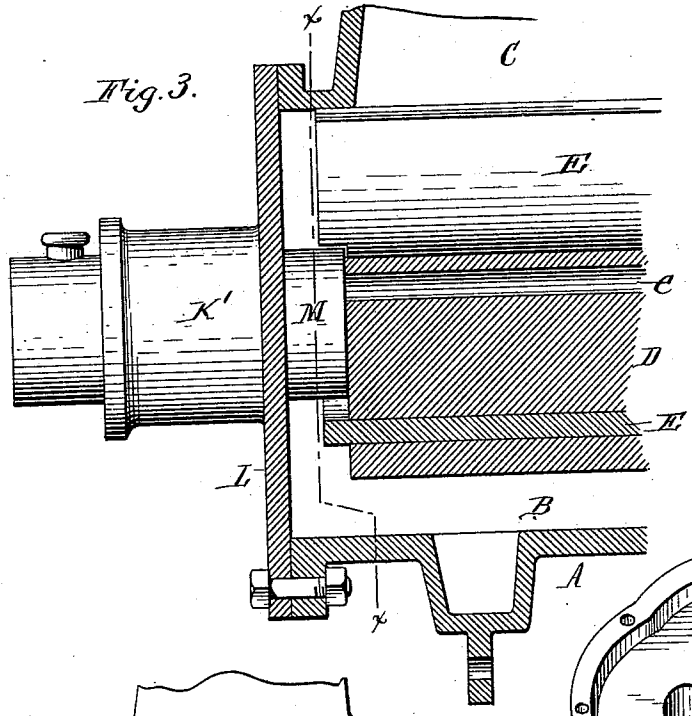


Fig. 5.

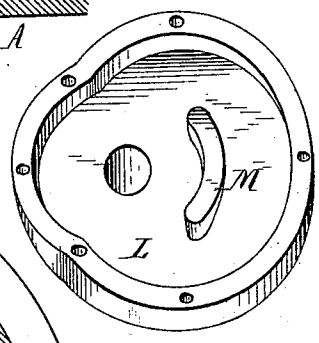


Fig. 4.

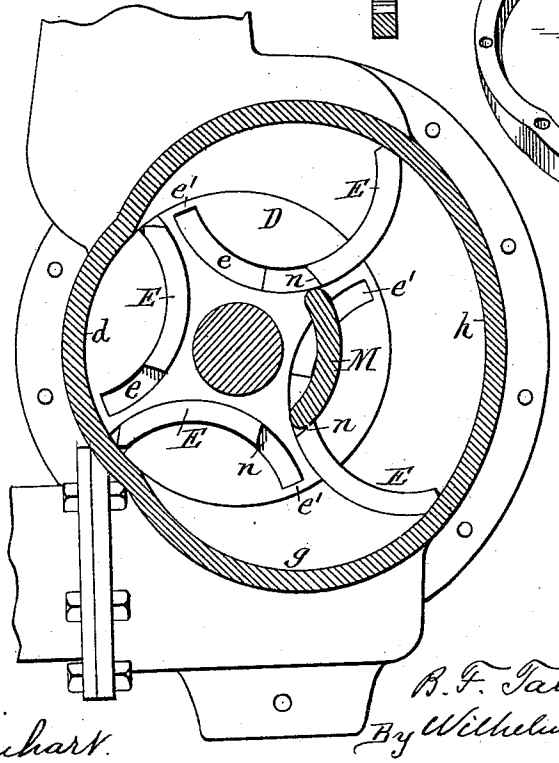
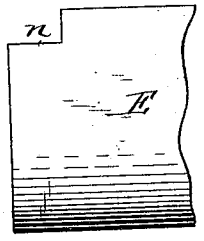


Fig. 6.



Witnesses.
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UNITED STATES PATENT OFFICE.

BENJAMIN F. TABER, OF BUFFALO, NEW YORK.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 471,279, dated March 22, 1892.

Application filed May 15, 1891. Serial No. 392,812. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN F. TABER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Rotary Pumps, of which the following is a specification.

This invention relates to an improvement in that class of pumps which are provided with a revolving cylinder arranged eccentrically in an inclosing case and sliding pistons which revolve with the cylinder and run with their outer edges in contact with the inclosing case. Heretofore these pistons were usually arranged in pairs and extended through the cylinder, so that when one of the pistons receded into the cylinder the opposite piston moved out from the cylinder. The receding of the pistons was caused principally by the outer edge of the pistons bearing against the eccentric side of the case, which produced excessive wear of the case. The column of water pressing upon the receding piston of a pair also caused the opposite projected piston to grind heavily against the side of the case.

The object of my invention is to so construct the pistons that they will move inwardly and outwardly in the cylinder principally by their own weight, and thereby reduce the wear against the case.

In the accompanying drawings, consisting of two sheets, Figure 1 is a longitudinal sectional elevation of my improved pump. Fig. 2 is a vertical cross-section thereof. Fig. 3 is a fragmentary longitudinal section, partly in elevation, of my improved pump designed more particularly for pumping heavy liquids. Fig. 4 is a cross-section in line *x x*, Fig. 3, looking toward the right. Fig. 5 is a perspective view of one of the heads of the pump. Fig. 6 is a fragmentary side elevation of one of the pistons.

Like letters of reference refer to like parts in the several figures.

A represents the inclosing case of the pump, supported on a suitable base-frame and provided with a suction-chamber B at its lower end and a discharge-chamber C at its upper end.

D represents the piston-cylinder, arranged eccentrically in the case with its periphery in contact with an abutment *d*, formed by one side of the case between the suction and discharge-chambers.

E represents the sliding pistons, arranged in grooves or ways *e*, formed in the cylinder. Each of these pistons, which are preferably four in number, consists of a segmental or arc-shaped plate having concavo-convex sides, and the groove in the cylinder receiving said plate has the same curvature as the plate, so that the latter can move freely in and out in the groove. The cylinder is formed of a solid casting with a separate or independent groove or way for each piston. Each groove opens with its outer end through the periphery of the cylinder and extends in a curved line from its outer end inwardly toward the axis of the cylinder, and then outwardly toward the periphery of the cylinder, its inner end being closed by the periphery of the cylinder, as shown at *e'*, Fig. 2. By this arrangement the pistons rotate with their concave sides forwardly. As soon as a piston has passed below the abutment *d* it slides outward in its groove by its own weight until it bears against the eccentric portion *g* of the case formed below the abutment. The pistons therefore move in contact with the case with comparatively little friction, but are at the same time held against the case by gravity sufficiently snug to insure the proper working of the pump. The concentric portion *h* of the case limits the outward movement of the pistons, and the latter raise the water in moving upwardly past this portion of the case. When the piston has reached the upper end of the concentric portion *h* of the case, the piston and its groove stand at such an inclination as to cause the piston to slide into its groove by gravity. By constructing and arranging the pistons as described the pressure of the outer ends of the pistons against the case is exerted nearly in the direction or arc in which the pistons move, thereby facilitating the entrance of the pistons into their grooves and reducing the wear upon the upper portion of the case. The walls of the curved grooves, owing to the peculiar form and arrangement of the latter, retard the outward movement of the segmental pistons sufficiently to prevent the pistons from being heavily forced against the surrounding case, but not to such an extent as

to interfere with the free operation of the pistons.

When two connected pistons are arranged to slide diametrically through the cylinder, as heretofore constructed, the column of water in the discharge-chamber exerts a heavy pressure upon the receding piston, which pressure is transmitted to the outwardly-moving piston on the opposite side of the cylinder, causing the latter piston to grind unduly against the bottom or lower side of the case. By my improved construction the pistons are not acted upon by the water-pressure in this manner, but simply bear by gravity against the case, whereby the wear upon the pistons and the case is materially reduced. The outer edge of each piston is preferably chamfered on its rear side, so as to fit snugly against the inner side of the case when in its working position.

G represents the driving-shaft formed on one end of the cylinder, and h' is the bearing formed on the adjacent head H of the case and in which the driving-shaft is journaled.

K is a trunnion formed on the opposite end of the cylinder and journaled in a bearing K′, formed on the opposite head L of the case.

When the pump is used for pumping liquids of a heavy consistency—such as molasses or soap-makers' stock—the viscous liquid entering the grooves of the pistons is liable to retard their free action, and in order to cause the pistons to be positively moved outward under such conditions a cam or projection M is preferably employed, which is so located relatively to the pistons that as soon as the pistons have passed below the abutment d their inner portions strike the cam and are projected from their grooves. As represented in Figs. 3, 4, and 5, the cam M is formed on the inner side of the head L within the periphery of the piston-cylinder and the adjacent ends of the pistons project beyond the end of the cylinder and are provided near their inner ends with a shoulder n. The cam M is arranged in the path of the shoulders of the pistons, so that as the cylinder rotates the pistons are successively projected from the cylinder by their shoulders striking the cam M.

I claim as my invention—

1. The combination, with the inclosing case, of a rotary cylinder arranged eccentrically in said case and provided with independent curved grooves or pockets, each extending in the arc of a circle from the periphery of the cylinder inwardly toward the axis of the cylinder and outwardly toward the periphery thereof, and segmental or arc-shaped pistons arranged loosely in said grooves and capable of sliding bodily in the same, the pistons having no attachment to the cylinder and being guided in their movements by the walls of the grooves, substantially as set forth.

2. The combination, with the inclosing case, of a rotating cylinder arranged eccentrically in said case and provided with independent arc-shaped grooves, each arranged on one side of the axis of the cylinder and trending with both ends toward the periphery of the cylinder and having one end terminating near the periphery of the cylinder and the other opening through the periphery, and sliding arc-shaped pistons arranged loosely in the grooves of the cylinder and guided by the walls of said grooves, substantially as set forth.

Witness my hand this 13th day of May, 1891.

BENJAMIN F. TABER.

Witnesses:

JNO. J. BONNER,

FRED. C. GEYER.