(No Model.) 2 Sheets—Sheet 1.

J. M. ALLEN.

ROTARY PUMP.

No. 360,841. Patented Apr. 12, 1887.

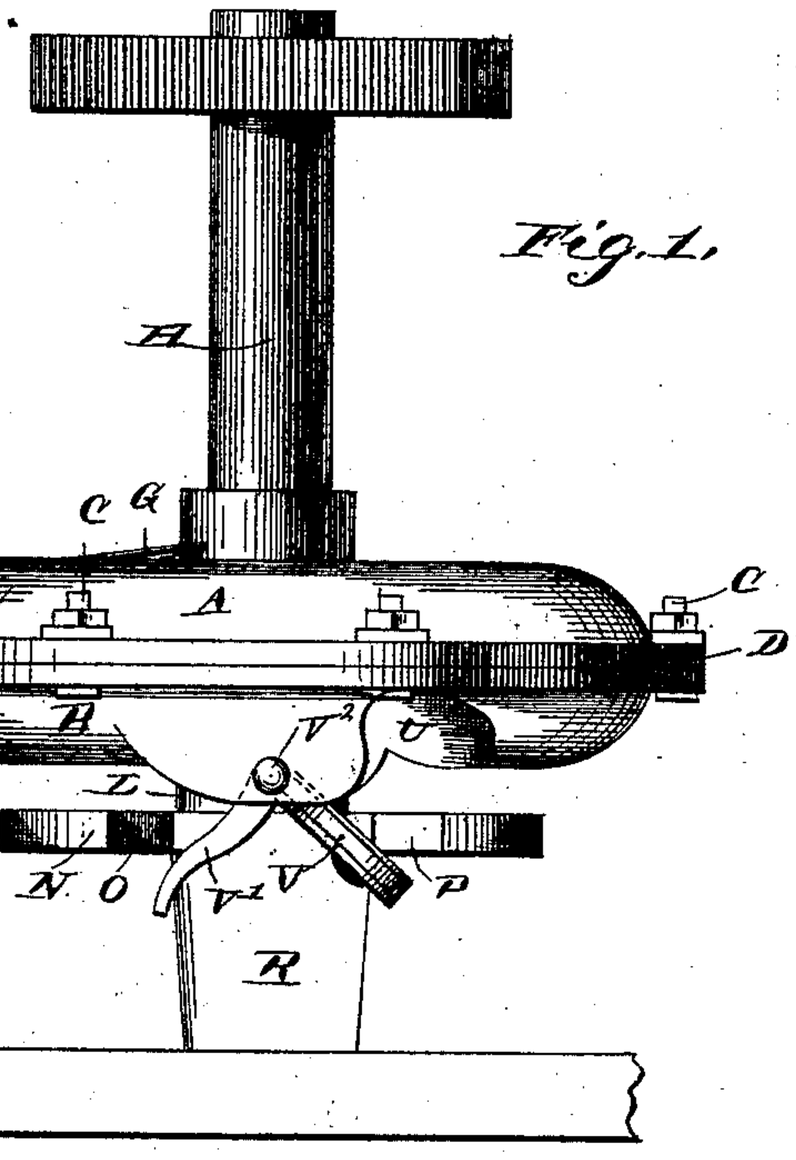


Fig. 1.

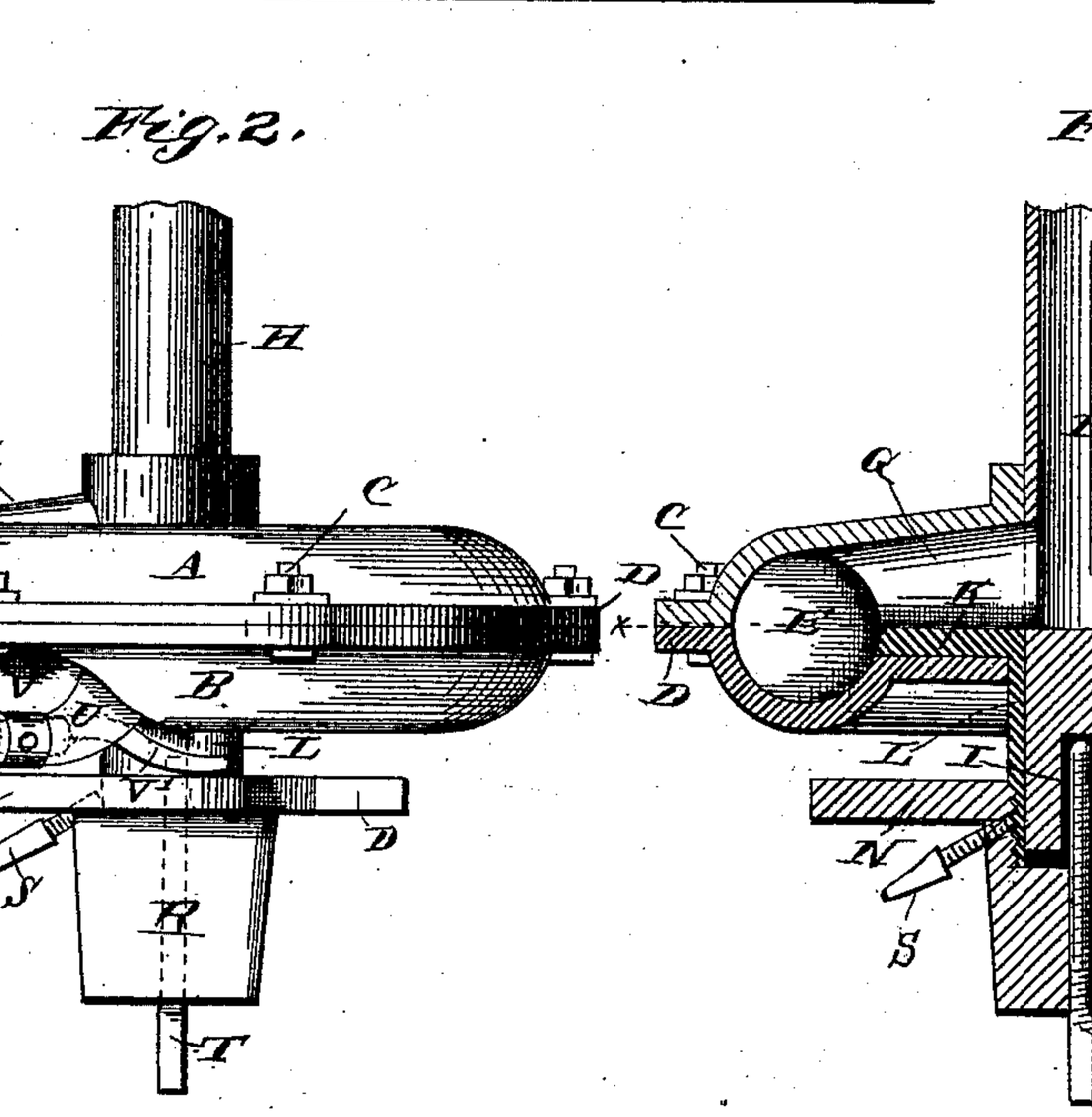


Fig. 2.

Fig. 3.

Witnesses
Chas. L. Taylor
J. W. Garner

Inventor
Joseph M. Allen
By his Attorneys
C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

J. M. ALLEN.

ROTARY PUMP.

No. 360,841. Patented Apr. 12, 1887.

Fig. 4.

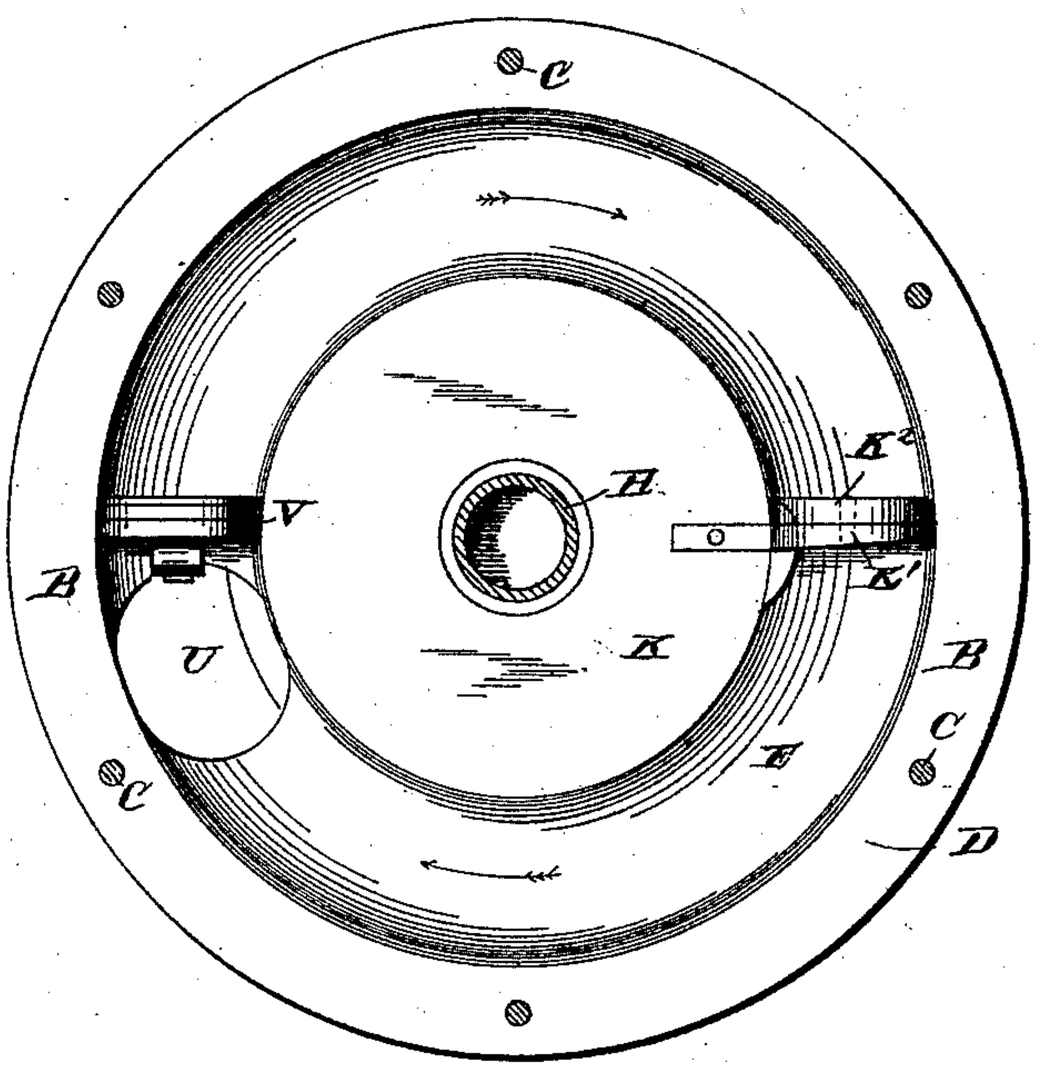
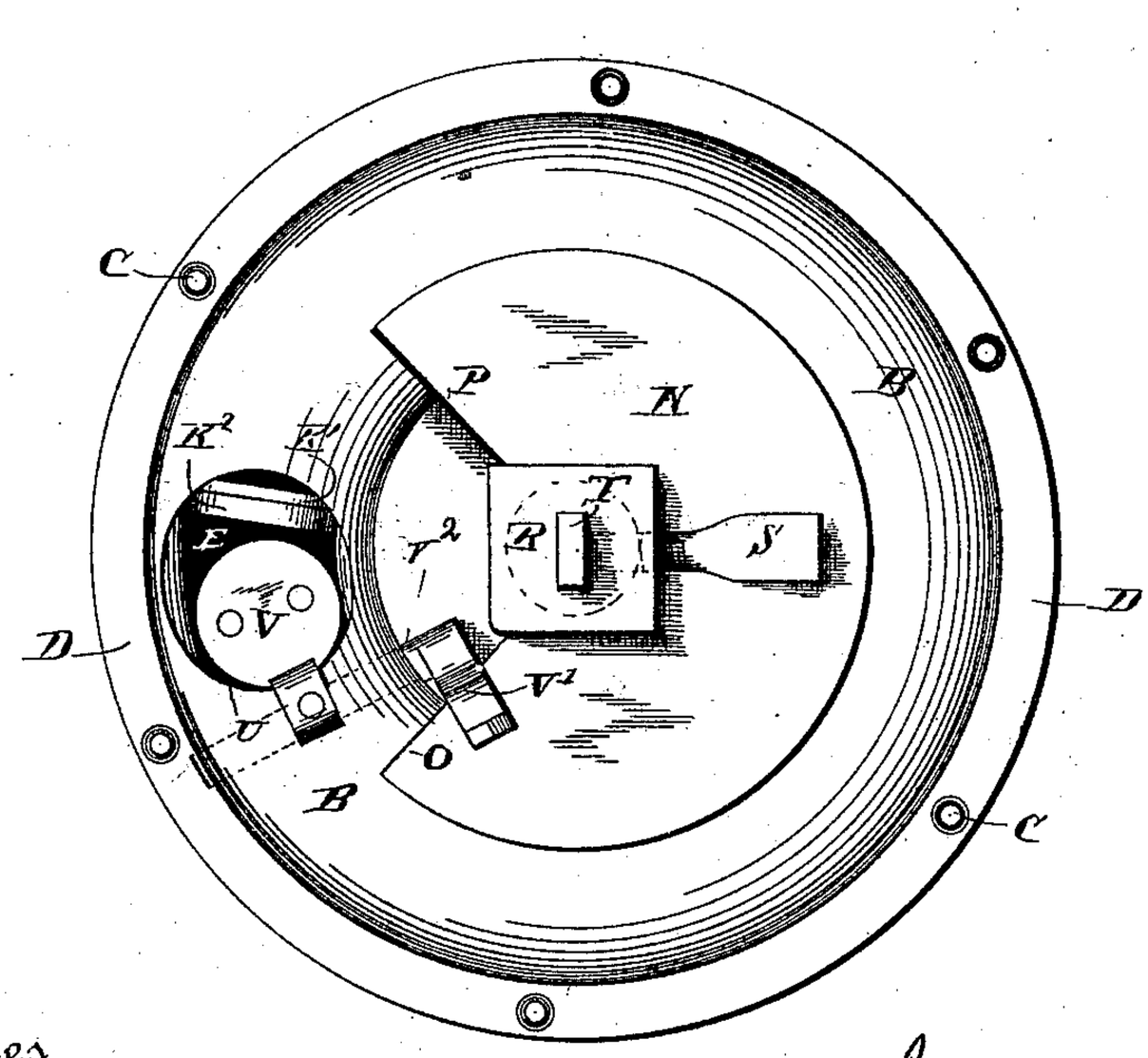


Fig. 5.



Witnesses
Chas. L. Taylor
J. W. Garner

Inventor
Joseph M. Allen
By his Attorneys
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

JOSEPH M. ALLEN, OF HAMPTON, FLORIDA.

ROTARY PUMP.

SPECIFICATION forming part of Letters Patent No. 360,841, dated April 12, 1887.

Application filed October 11, 1886. Serial No. 215,934. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. ALLEN, a citizen of the United States, residing at Hampton, in the county of Bradford and State of Florida, have invented a new and useful Improvement in Rotary Pumps, of which the following is a specification.

My invention relates to an improvement in rotary pumps; and it consists in the peculiar construction and combination of devices, that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a rotary pump embodying my improvements, showing the valve open. Fig. 2 is a similar view showing the valve closed. Fig. 3 is a vertical sectional view. Fig. 4 is a horizontal section taken on the line *x x* of Fig. 3. Fig. 5 is an inverted plan view.

The pump-case is circular in shape, and is composed of an upper section, A, and a lower section, B. The said sections are bolted together by means of bolts C, which extend through annular projecting flanges D, with which the sections of the case are provided. The section A is provided on its under side with a semi-cylindrical annular groove, and the section B is provided on its upper side with a semi-cylindrical annular groove, whereby, when said sections are bolted together, a cylindrical annular chamber, E, is formed between them. The section A has a radial channel, G, the outer end of which communicates with the annular chamber, and the inner end of which communicates with a transverse opening, which is made near the lower end of a hollow shaft, H, which extends from the upper side of the section A at the center thereof, and is rigidly secured to the said section. The lower end of the hollow shaft H projects for a suitable distance below the lower side of the section A, and is closed, and in the lower end of the said shaft is made a vertical central recess, I.

K represents a circular disk, which bears between the central opposing faces of the sections A and B, and is provided with a vertical depending hollow sleeve, L, that is journaled in a central opening made in the lower section, B.

To the lower end of the hollow sleeve, below the section B, is attached a cam-wheel, N, about one-third of the rim of which is cut away, thereby forming shoulders O and P. At the center of the cam-wheel, on its lower side, is formed a hub or base, R, the sides of which are rectangular. The lower end of the shaft H extends into the hollow sleeve, and is adapted to rotate therein. A set-screw, S, extends through the base R, and bears against one side of the hollow sleeve to clamp the latter to the base, and thereby prevent the disk K and the piston from rotating. Through the lower end of the base R, at the center thereof, extends a vertical set-screw, T, which enters the vertical recess I at the bottom of the hollow shaft. From one side of the circular disk K projects a piston, K′, which works in the annular cylindrical chamber E, and is provided on its front side with a packing-disk, K^2, to prevent leakage.

The lower section, B, of the pump-case is provided with a large inlet-opening, U, which communicates with the annular cylindrical chamber E.

In the lower side of the lower section, B, is made a horizontal radial opening, in which is journaled a rock-shaft, V^2.

V represents a circular valve, which is attached to the rock-shaft and arranged at one side of the opening U, the diameter of the said valve being equal to the diameter of the annular chamber, and thereby the valve is adapted to close the said chamber when turned to a vertical position.

V′ represents a rocking tappet-arm, which has one end rigidly attached to the rock-shaft. The free end of the tappet-arm bears normally on the cam-wheel and supports the valve in a vertical position.

The operation of my invention is as follows: The pump is submerged at the bottom of the well or cistern or other source of water, and the base R, the cam-wheel, and consequently the hollow sleeve, the circular disk, and the piston are held stationary by any suitable means. In Fig. 1 of the drawings I illustrate a bridge-beam, to which the base is attached to support the base stationary; but any other suitable preferred means may be employed for this purpose. The pump-case is rotated in the direction indicated by the arrow in Fig. 4 by turning the hollow shaft H, and this causes

the annular chamber to sweep around the stationary piston. The tappet-arm V′ bears on the upper side of the cam-wheel, as before stated, and thus the valve V is kept closed in the annular chamber E during about two-thirds of each rotation of the pump-case, thereby permitting the water to enter the annular chamber on the rear side of the piston through the inlet-opening U. As soon as the rotation of the pump-case brings the tappet-arm V′ past the shoulder O of the cam, it is disengaged and drops by its own gravity, and at the same instant the valve, being carried by the pump case, comes in contact with one side of the piston, and thereby the valve is forced open to a horizontal position, thus permitting the valve to pass and partly, but not entirely, closing the inlet-opening U. As soon as the said opening has passed beyond the said piston, the shoulder P of the cam-wheel strikes against the tappet-arm, thus forcing the valve to its vertical position. At each rotation of the annular chamber around the piston the water in the chamber is driven before the piston through the channel G in the upper section into the hollow pipe, in which it ascends, and water is drawn through the inlet-opening into the hollow chamber E by reason of a partial vacuum being formed therein in rear of the piston.

The valve is carried by the case in its revolving movements, and each time it approaches the stationary piston K it is automatically operated to lie or be inclosed within the valve-opening in the lower section of the case, so that it will not strike the piston, and is thereby prevented from breakage and damage, the valve after it has passed the piston being returned to and held in its vertical position. The valve only partially closes the inlet-opening in the revolving case, so that when the valve is depressed water will still continue to flow, but in very greatly-reduced quantities, through the inlet-opening into the annular chamber E, and thereby prevent the formation of a complete vacuum therein. It will thus be seen that at each rotation of the shaft H water is forced upwardly therethrough by the piston.

I do not desire to limit myself to the precise construction hereinbefore described, as it is evident that modifications may be made therein without departing from the spirit of my invention.

Having thus described my invention, I claim—

1. The combination, in a rotary pump, of the submerged rotating case composed of upper and lower horizontal sections having the annular chamber E, the inlet-opening communicating with the said chamber and the outlet-opening extending therefrom and a vertical hollow actuating-shaft communicating with said piston-chamber through said opening, the valve V, pivoted in the inlet-opening and having the arm V′, the stationary piston located in the chamber E and around which the case travels, and the stationary cam-wheel or disk N, on which the arm V′ rests while the valve is closed and having the opening in one side and thereby forming shoulders O and P, for the purpose set forth, substantially as described.

2. In a rotary pump, a rotary shell or case comprising the upper and lower horizontal sections provided in their opposing faces with concentric grooves forming an annular chamber, one section having an outlet-channel communicating with the annular chamber and the other section having an inlet-opening, in combination with a rotary hollow shaft carrying the shell and communicating with the outlet-channel to permit the contents thereof and of the annular chamber to escape therethrough, a stationary piston arranged in the annular chamber, and automatic valve mechanism for partially closing the inlet-opening each time it passes the stationary piston during the rotations of the shell, as and for the purpose described.

3. In a rotary pump, the combination of a hollow rotary shaft having the closed lower end and an inlet opening above the closed portion thereof, the rotary sectional case carried by the shaft and having an inlet-opening, and an annular chamber, E, which communicates with the hollow shaft by an intermediate channel, a fixed or stationary disk interposed between the opposing faces of the sections of the case and having the vertical tubular sleeve passing through the lower case-section, in which sleeve the closed end of the hollow shaft is journaled, a stationary piston connected to the fixed disk and located within the annular chamber, and automatic valve mechanism carried by the case for partially closing the inlet-opening at each revolution of the case, as and for the purpose described.

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

JOSEPH M. ALLEN.

Witnesses:
G. W. McKINNEY,
R. M. ALOVEZ.