

UNITED STATES PATENT OFFICE.

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PUMP AND PRIME MOVER.

1,061,107.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CARL F. NORDMARK, a subject of the King of Sweden, and a resident of Lynn, in the county of Essex and State of Massachusetts, have invented a new and Improved Pump and Prime Mover, of which the following is a full, clear, and exact description.

This invention relates to machines capable of use as pumps and as prime movers, and has reference more particularly to a device of this class which comprises a casing having an inlet and an outlet, a rotor in the casing, a movable abutment adapted to co-operate with the rotor, and an operative connection between the rotor and the abutment, and located at the outside of the casing.

The object of the invention is to provide a simple and efficient machine which can be used as a suction or force pump, and can also be employed as a prime mover, which is compact in form and light in weight, which comprises comparatively few parts, which will not readily become disarranged or broken, and in which the movable abutment controlling the operation of the rotor is operated mechanically by the rotor itself, so that frictional operation of the abutment by the rotor, and the excessive wear incident thereto, are avoided.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claim.

Reference is to be had to the accompanying drawings forming part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a longitudinal section of a machine constituting an embodiment of my invention, the section being taken on the line 1—1 of Fig. 2; Fig. 2 is a horizontal section on the line 2—2 of Fig. 1; and Fig. 3 is a diagrammatic side elevation showing a rotor of modified form, certain of the associated parts being indicated in dotted outline.

Before proceeding to a more detailed explanation of my invention it should be clearly understood that while the machine is particularly well adapted for use as a pump, either suction or force pump, it can also be used as a prime mover if a suitable motive fluid such as steam or compressed air be admitted to the rotor casing through the inlet opening. The outlet opening, of course, be-

comes the exhaust opening under these circumstances. It will be understood that when the device is used as a pump, the inlet and the outlet are used for the admission and expulsion of the fluid which is being pumped, in the usual manner. The machine when used as a pump is operated by suitably connecting the main shaft with a source of motive power, by means of a belt, or in any other convenient manner.

Certain of the details of construction shown for example herewith, form no part of the invention and can be varied in accordance with individual preference and special conditions, without deviating from the spirit of the invention as defined in the appended claim.

Referring more particularly to the drawings, I provide a casing 10 of substantially cylindrical form, and having at one side a removable head 11. The casing is supported upon a base 12 of convenient type, and has a suitable inlet 13 and a corresponding outlet 14 provided with flanges 15 to facilitate their attachment to pipes or the like. The head 11 and the side of the casing opposite thereto are provided with bearings 16 in which is journaled the main shaft 17. Keyed or otherwise rigidly mounted upon the shaft is a rotor 18 comprising, for example, two rounded and oppositely disposed vanes 19. The vanes are so proportioned that their aggregate length is substantially equal to the diameter of the casing. The rotor is thus free to move within the casing, though dividing it into two parts. Between the inlet and the outlet the casing has secured thereto a lateral extension casing 20 of elongated form. Slidably mounted within the extension casing is an abutment 21, movable into and out of the casing 10 and having a rounded edge 22 positioned close to the rotor along a length of the same, that is, along a line parallel to the axis of rotation. At one side, the extension casing has a slot 22 through which projects an arm 23, preferably integral with the abutment. A connecting rod 24 has one end secured to the arm 23 by means of a bolt 25. At the other end the connecting rod has an upwardly and downwardly extended head 26 provided with a longitudinal slot 27 for a purpose to appear hereinafter. Outside of the casing and adjacent thereto the shaft 17 has keyed or otherwise rigidly mounted on it a gear wheel 28 in mesh with a pinion 29.

The latter is loosely mounted upon a spindle 30 set in a recessed boss 31 of the casing side, extending laterally therefrom. A crank disk 32 is likewise mounted upon the spindle 30, and, as shown for example herewith, may be integral with the pinion. The crank disk, near the periphery carries a crank or wrist pin 33 received within the slot 27 and having a head 34. The wrist pin 33 is located in a curved slot 35 of the crank disk and is thus capable of adjustment.

Mounted upon the casing side, above and below the connecting rod, are L-shaped guide flanges 26 which are engaged by the ends of the connecting rod head, and serve to guide the connecting rod in its longitudinal, reciprocatory movement. A cover having a body 37 and an elongated extension 38 is mounted over the gear wheel, the pinion, the guides and the connecting rod, and is secured in position in any suitable manner, for example, by means of lugs 39 and screws 40. The arrangement of the parts is such that as the rotor revolves within the casing, the connecting rod is reciprocated through the intermediate connecting members, *i. e.*, through the gear, the pinion, the crank disk and the wrist pin. As the abutment is rigidly secured to the connecting rod it is moved into and out of the casing as the rotor revolves, the arrangement being such that the end of the abutment is always positioned adjacent to the rotor, and thus constitutes a partition or wall between the inlet and the outlet. Accordingly, the fluid entering the casing through the inlet is forced from the casing, through the outlet, by the action of the rotor. When the machine is used as a prime mover, the motive fluid entering through the inlet drives the rotor and causes the same to revolve. The fluid subsequently escapes at the outlet. The power

developed is transmitted from the shaft to its point of utilization.

The modified form shown in Fig. 3 includes a rotor 41 which instead of being double-vaned is in effect heart-shaped, and is keyed or otherwise secured upon the main shaft 42 within the cylindrical casing 43. The crank disk 44 is mounted directly upon the main shaft 42 and serves to actuate the sliding abutment 45 through a connecting rod 46. In this form of the device the number of parts is reduced and the construction is somewhat similar. The operation is otherwise the same.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:

A device of the class described comprising a casing having an inlet and an outlet, a main shaft extending through said casing, a rotor within said casing, on said shaft, an extension casing connected with said first casing an abutment slidably mounted in said extension casing and movable into and out of said first casing, said extension casing being located between said inlet and said outlet, a gear mounted upon said shaft, at the outside of said casing, a pinion in mesh with said gear, a crank disk rigid with said pinion and having a wrist pin, and a connecting rod located at the outside of said casing and operatively connected with said abutment, said connecting rod having a slotted head, said crank disk having a wrist pin received in said slotted head.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL F. NORDMARK.

Witnesses:

ALICE F. TRUSSELL,
CHAS. G. WOODBRIDGE.