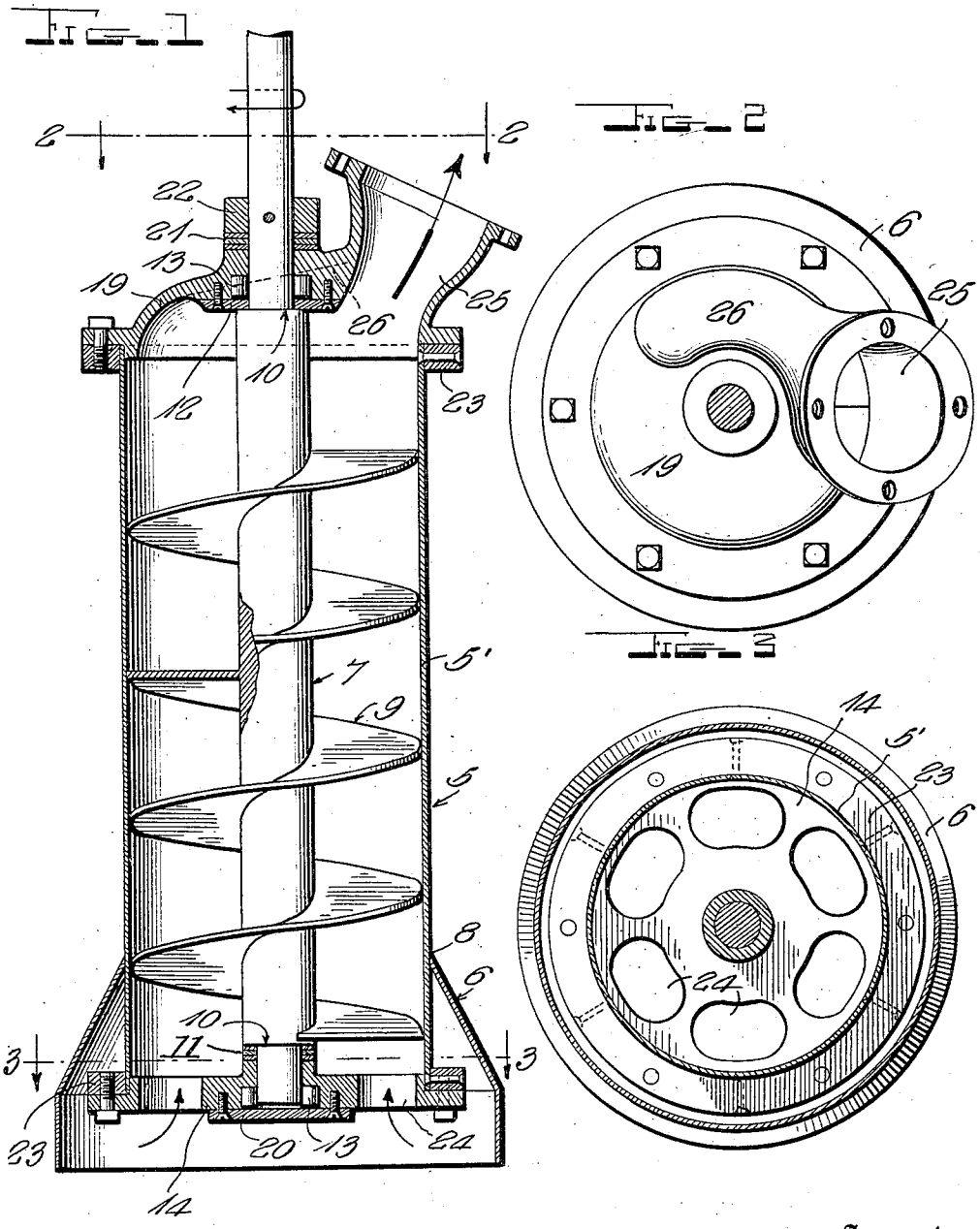
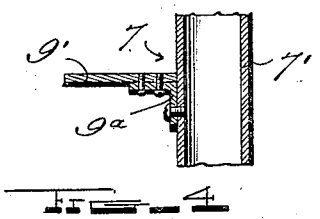
H. W. LOCKLEY.

DREDGING PUMP.

APPLICATION FILED MAY 26, 1919. RENEWED MAY 23, 1921.

1,401,994. Patented Jan. 3, 1922.





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DREDGING PUMP.

1,401,994. Specification of Letters Patent. Patented Jan. 3, 1922.

Application filed May 26, 1919, Serial No. 299,814. Renewed May 23, 1921. Serial No. 471,967.

To all whom it may concern:

Be it known that I, HARRY W. LOCKLEY, a citizen of the United States, residing at New Castle, in the county of Lawrence and State of Pennsylvania, have invented certain new and useful Improvements in Dredging Pumps; and I do 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.

This invention relates to pumps, and it relates more specifically to an improved dredging pump.

One object of this invention is to generally improve upon devices of this character by providing a very simple and efficient means for excluding excessive water from the pump while increasing the force of the water against the sand, mud or other earthy material being pumped from the bottom of the body of water.

Other objects and advantages may become apparent to persons who read the following details of description in connection with the accompanying drawings, in which:

Figure 1 is a central vertical sectional view, the section being taken through the casing, hood and a portion of the helical blade of the rotor.

Fig. 2 is a top plan view of the structure disclosed in Fig. 1.

Fig. 3 is a horizontal sectional view along the line 3—3 of Fig. 1.

Fig. 4 is a central sectional detail illustrating a portion of a rotor of slightly different construction from that which is disclosed in Fig. 1.

Referring to these drawings in detail, in which similar reference characters correspond with similar parts throughout the several views, the device consists broadly of a casing 5, a hood 6 and a rotor 7; and a very important feature of the invention resides in the fact that the hood 6 is slidably engaged with the tubular member 5′ or casing 5 at a line which extends around the tubular member as indicated at 8. The tubular member 5′ is preferably cylindrical so that the outer edge of a helical blade 9 on the rotor 7 touches or nearly touches the inner surface of the tubular member at all points along the edge of the blade 9. The rotor 7 is preferably reduced at its upper and lower portions to form journals and also to form shoulders 10 which bear upon the thrust plates or bearing elements 11 and 12. The plate 12 is effective as a thrust plate when the rotor is turned in the direction for forcing material outward through the inlet end, as, for instance, when the inlet end becomes clogged or chocked with brush, grass, weeds, etc. However, the thrust plates 11 are effective during the normal pumping operation which forces the rotor downward on these plates. Therefore, sand and other earthy materials are excluded from the lower journal, so that the wearing thereof is reduced to the minimum. However, in order to enable the rotor 7 to turn with the least resistance, roller bearings may be provided for its upper and lower journals, as indicated at 13, these bearings being seated in races formed in a bottom disk or plate 14 and a cap or cover 19. A plate 20 is removably secured to the lower surface of the disk or plate 14, and the plate 20 supports the lower roller bearings and serves as a means to permit these bearings to be packed with lubricating material and to retain the lubricating material in and exclude water and other material from the lower bearings. The plate 12 serves a similar function for the upper bearings similar to that described for the plate 20 relative to the lower bearings. Moreover, packing disks or thrust plates 21 may be provided on the upper end portion of the rotor, a seat being provided therefor on the upper end of the casing, and a collar 22 being secured on the rotor. It will be seen that the thrust plates 11 and 21 mutually cooperate in sustaining the rotor against downward movement relative to the casing.

Each end of the cylinder or tubular member 5′ is provided with an annular flange 23 which may be formed integrally therewith or riveted thereto as indicated in Fig. 1. The flanges 23 are provided with screw threaded apertures which engage with bolts or other appropriate means for securing the members 14 and 19 on the lower and upper ends of the cylinder 5′. Moreover, the lower flange 23 limits the downward movement of the hood 6, and the upper flange 23 prevents the hood from being disengaged from the cylinder 5′, so that the hood 6 can only be removed by first removing one of the flanges 23.

The lower plate or disk 14 is provided with an annular series of inlet ports or apertures 24 through which may enter any solid

object of a predetermined size, that is, of a size which is not too large to be passed with ease through the pump. In this connection, it will be seen that the upper or outlet end of the pump is provided with an outlet port 25 which is larger in lateral area than any one of the ports 24. It will also be seen that while the upper end of the port or pipe connection 25 is substantially circular, its lower end is radially narrowed and circumferentially extended with relation to the circular area of the casing. Moreover, it will be seen that the circumferentially extended portion 26 is upwardly inclined toward the upper end of the port 25, the inclination of this portion 26 being substantially equal to that of the edge of the helical blade 9. Therefore, the earthy material encounters the minimum of resistance to being forced through the port 25 by the action of the blade 9.

The function and advantages of the hood 6 will now be explained in connection with the operation of the device as follows:

Assuming that the outlet connection 25 is coupled with a discharging pipe and that the rotor is being turned (by any suitable means not shown) in the direction of the arrow, and that the apertured disk 14 rests upon the bottom of a body of water, it will be seen that the hood 6 will also rest upon the bottom or be somewhat embedded in the bottom, its lower end being thin, so that its weight will cause it to enter the mud or sand upon which it rests. Moreover, the action of the rotor 7 tends to create a vacuum in the cylinder 5′, thereby increasing the downward pressure on the hood 6 which is bell-shaped or downwardly flaring, and this downward pressure tends to drive the hood farther downward into the bottom being dredged, thereby tending to exclude water from the interior of the pump. However, when the suction becomes sufficiently great, the water pressure forces the earthy material under the lower edge of the hood, and thence upward through the ports 24, cylinder 5′ and outlet 25. By this means, it will be seen that the force of water is increased, for cutting away the bottom being dredged, while the volume of water passing through the pump is decreased or reduced to the minimum. Moreover, it will be seen that the scope of the pump is increased because the lower end of the bell is much larger in horizontal area than the lower end of the casing 5.

Referring to Fig. 4, it will be seen that the rotor 7 may be made in separate pieces instead of being formed integrally as indicated in Fig. 1. In this embodiment, journals may constitute the ends of a shaft which is of equal diameter throughout its length and the tubular member 7′ may be secured around the shaft by any appropriate means not shown. Moreover, the helical blade 9′ may be secured to the tubular element 7′ by means of one or more angle irons 9^a and bolts, screws or other appropriate securing means.

Although I have described this embodiment of my invention very specifically, it is not intended to limit this invention to these exact details of construction and arrangement of parts, but I am entitled to make appropriate changes within the scope of the inventive idea as described and claimed herein.

What I claim as my invention is:

1. A dredging pump comprising a cylindrical casing having open upper and lower ends provided with outstanding flanges, heads closing the ends of the casing and having inlet and outlet openings, a screw conveyer rotatably mounted in the casing and having its shaft extending above the upper head and a hood of greater diameter than the flange at the lower end of the casing positioned about the casing and having a tapered upper portion slidably engaging the casing between the flanges.

2. In a dredging pump, a tubular member having an inlet end through which earthy material enters the pump, a flange extending out from said inlet end, an apertured plate secured to said flange and adapted to rest upon the bottom to be dredged, and a bell-shaped hood having its upper end in sliding engagement with said tubular member above said flange and being adapted to embed its lower end into said bottom below the level at which said plate rests.

In testimony whereof I have hereunto set my hand.

HARRY W. LOCKLEY.