No. 882,524. PATENTED MAR. 17, 1908.

M. LATTA.

PUMP.

APPLICATION FILED OCT. 17, 1907.

2 SHEETS—SHEET 1.

Fig. 1.

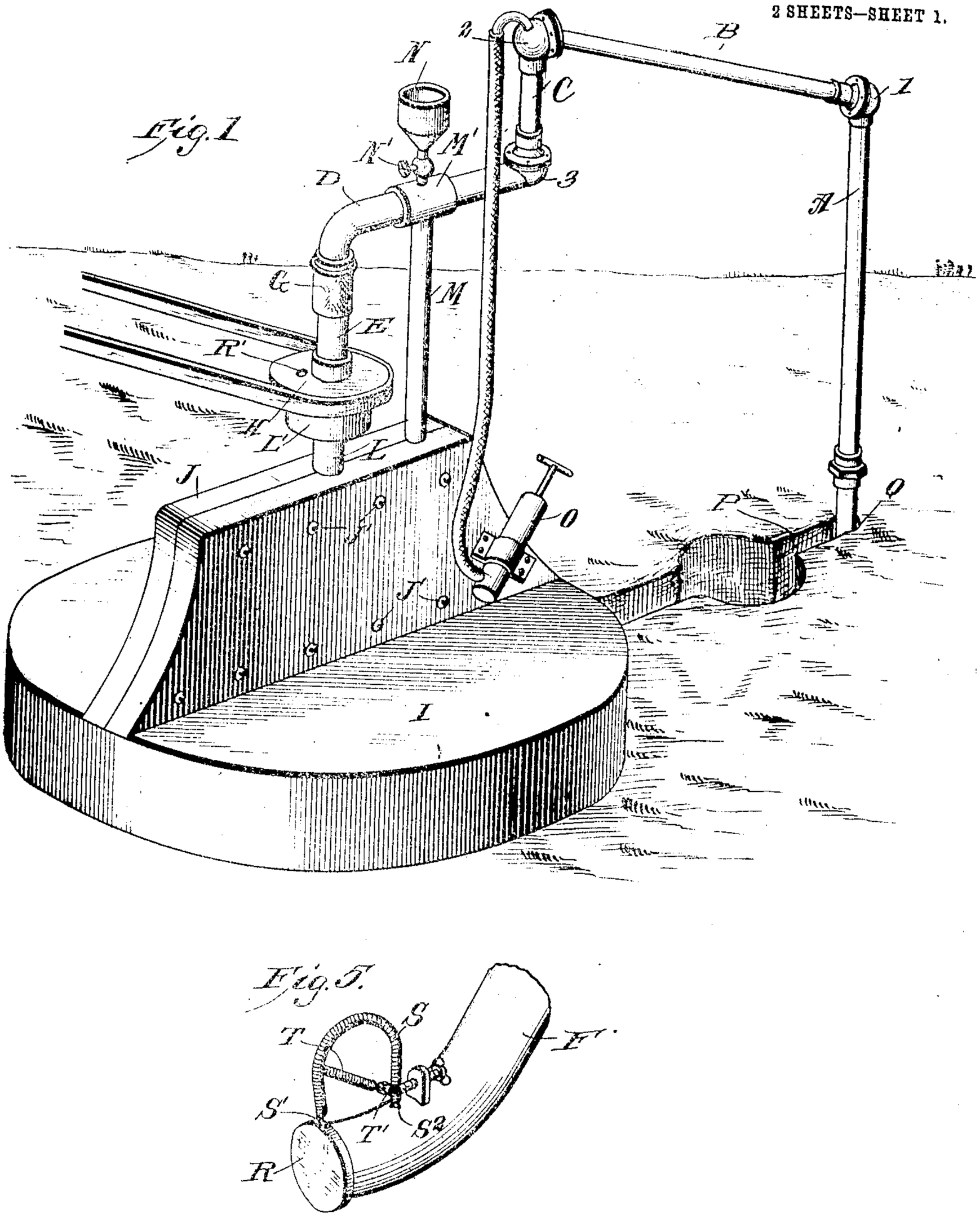

Fig. 5.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

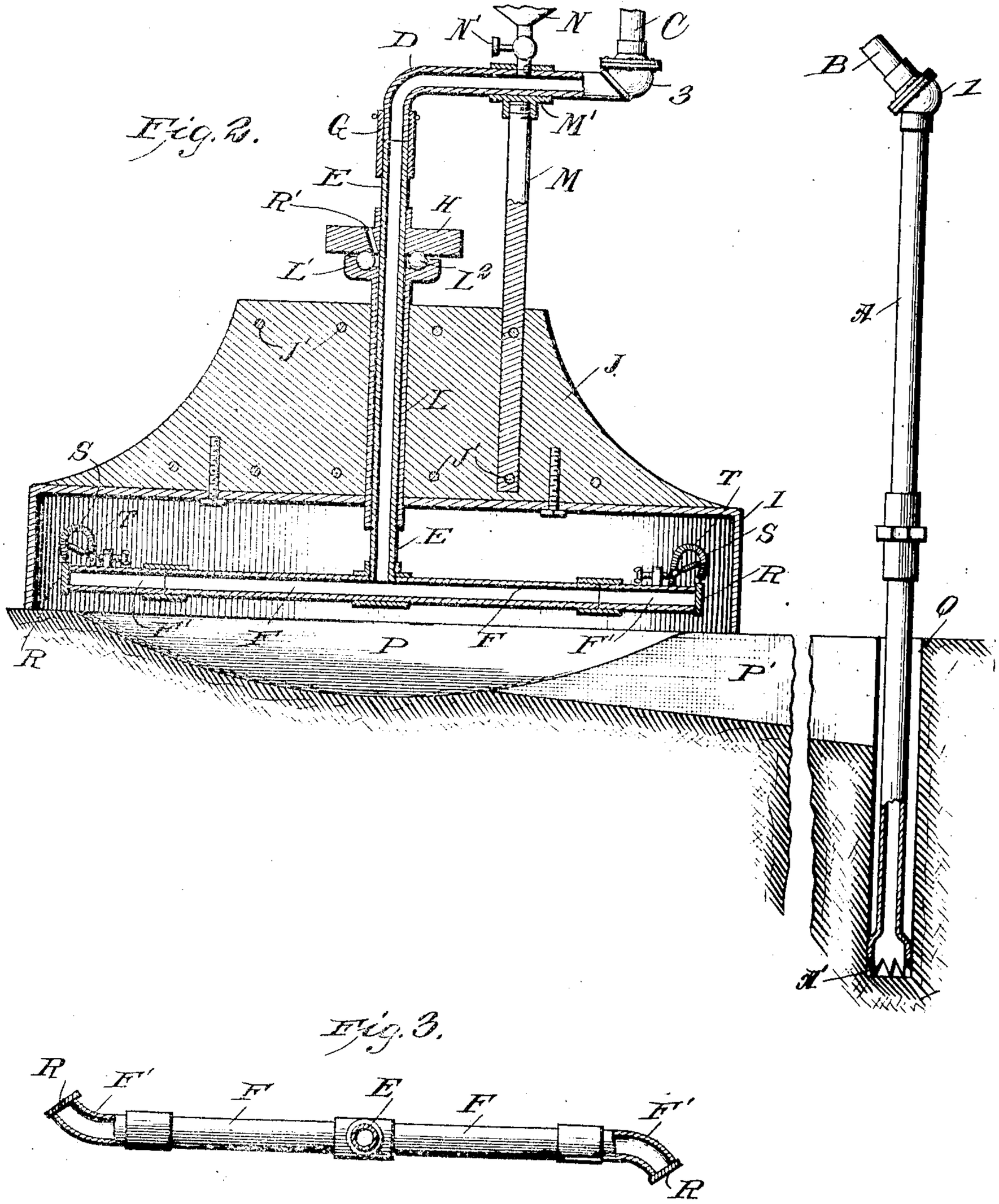
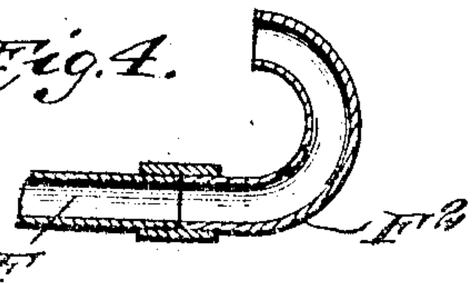


Fig. 3.

Fig. 4.



WITNESSES

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To all whom it may concern:

Be it known that I, MILTON LATTA, a citizen of the United States, and a resident of Valentine, in the county of Cherry and State of Nebraska, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention is an improvement in pumps designed for use in drilling wells and for other purposes; and the invention consists in certain novel constructions and combinations of parts as will be hereinafter described and claimed.

In the drawings Figure 1 is a perspective view of my improved apparatus as in use. Fig. 2 is a vertical longitudinal section thereof. Fig. 3 is a detail horizontal section of the revolving pump devices. Fig. 4 is a detail view showing an interchangeable device, and Fig. 5 is a detail perspective view illustrating the valve devices at the ends of the pump tube.

In carrying out my invention I provide in connection with a well tube A which may be supplied at its lower end with a drill A′ and tube sections B, C and D between the well tube A and the upright feed pipe E of the pump, the said feed pipe E extending down and communicating at its lower end with the inner ends of the pump tubes F of the centrifugal pump. The pipes A, B, C and D are universally jointed at 1, 2 and 3, as will be understood from Figs. 1 and 2, and the pipe E is connected at its upper end by a swivel coupling G with the downwardly turned end of the pipe D so the feed pipe E of the pump may be revolved in the operation of the invention. The pipe E may be driven by a belt applied to the pulley H on the said pipe, and the pump revolves within a casing I on the upper side of which are mounted face to face plates J bolted together at J′ and providing between them a seat for a bearing tube L which extends at its lower end into the casing I and at its upper end above the frame plates J and is provided above the said plates and immediately below the band pulley H with a cup L′ forming a race for balls L^2 upon which the band pulley H rests, thus forming a ball bearing support for the revolving portion of the tube. An upright M secured at its lower end to the frame plates J extends upwardly and forms a support for the tube section D, the upright screwing at its upper end into the coupling M′ encircling the said tube and said coupling M′ also forming a support for a primer N having a valved connection N′ with the pipe D and adapted to be used in priming the pump in the use of the apparatus.

An air pump O is connected with one of the tube sections, as shown in Fig. 1 and may be utilized to exhaust the air in the well tube and connections immediately preceding the operation of the centrifugal pump.

The tubes F′ form hollow arms of the centrifugal pump and operate within the casing I delivering the water drawn through the well tube A and connections into a hollow or pit P in the ground from which it passes through a ditch P′ to the well Q in which the well tube is operated. In the operation of the described construction, it will be noticed that when the pump is operated, the earth, gravel, etc. loosened at the drill end of the tube A will be sucked up through the tube A and thence through the connections and delivered to the hollow or depression immediately below the pump casing and thence pass through the ditch P′ back to the well tube down which it passes. The water passing down the well outside the well tube is slow, thus avoiding injury to the walls of the well while the upward current within the well tube will be strong and rapid and will operate efficiently to lift the water and the material loosened by the drill at the bottom of the tube.

From time to time in the operation of the drill, the tube A may be turned by a pair of tongs or otherwise, as is usual in the operation of drilling wells.

The pump tubes F have their outer sections F′ deflected slightly to the rear with respect to the direction of revolution and these sections F′ may be removable in order to use interchangeably with them the returned end sections F^2 shown in Fig. 4 of the drawings. In carrying out this feature of my invention, the sections F′ may be unscrewed and the sections F^2 screwed to place. The returned sections F^2 may be used in some instances, especially where no stones or the like are found which might have a tendency to clog in the returned portions of the pump tubes, instead of discharging directly out, as in the construction shown in Figs. 2 and 3.

The ends F′ of the tubes F are deflected slightly to the rear, as shown in Fig. 3, and as before described. While this deflection does not interfere with the free discharge of

stones and the like it aids in preventing air from passing back in the tubes.

The valves R fit against the outer ends of the pump tubes and press yieldingly against said ends being supported and actuated by springs S in the form of coil springs secured at one end S′ to their respective valves, and at the other ends S² to the pump tubes and operating to hold the valve disks R yieldingly against the outer ends of the valve tubes. Springs T connect at one end with the springs S and are connected at their other ends with the adjusting devices in the form of screws T′ which may operate to vary the tension of the springs S and increase or decrease the pressure with which the valves are seated against the outer ends of the valve tubes.

In operation when the pump is speeded up to a certain degree, the valves will operate to close the ends of the tubes and hold the water back. When, however, such degree of speed is exceeded the centrifugal force operating upon the water will open the valves and permit the water to discharge, the valve holding the water until sufficient pressure has been created to entirely fill the outer ends of the tube and thus prevent any entrance of air in the operation of the pump.

The construction shown in Figs. 2, 3 and 5 will be found useful where stones and other obstructions are experienced but where the soil and conditions are such that no stones are anticipated the return constructions shown in Fig. 4 may be employed, and this returned section will operate to retard the discharge of water from the pump tubes to such extent as to prevent the inflow of air in the operation of the invention.

The air pump it will be noticed especially from Fig. 1 is supported on the frame plates J in convenient reach of the operator and is connected by a pipe with an upper portion of the pipe connections with the drill tube A.

An oil hole R at the top of the band pulley H permits the feed of oil to lubricate all the moving portions of the apparatus.

From time to time when operating in dry soil a little water may be supplied to the trench or ditch in order to make up for any loss of water by absorption or otherwise.

A dip hole may be formed between the pump casing and the well hole as best shown in Fig. 2 so the cuttings may be dipped out by a shovel or other suitable implement, as they are delivered into the casing and run out and settle within the dip hole. Manifestly, the pump casing may be anchored rigidly to the ground in any suitable manner.

I claim—

1. In an apparatus substantially as herein described, the combination of a casing, a bearing tube projecting upwardly therefrom and provided at its upper end with a cup forming a ball race, balls in said cup, frame plates mounted on the casing on opposite sides of the bearing tube and below the ball cup, a centrifugal pump having laterally extending pump tubes within the casing and a feed tube extending upwardly within the bearing tube, a band pulley on the feed tube above the ball cup of the bearing tube, balls in said cup below the band pulley, valves seating against the outer ends of the pump tubes within the casing, springs supporting said valves and secured at one end to the valves and at their other ends to the pump tubes, adjusting springs connected with said valve springs, pipe connections with the feed tube, a primer connected with said pipe connections, an air pump supported on the frame plates and a tube connecting said air pump with the pipe connections, all substantially as and for the purpose set forth.

2. The combination with the casing and frame plates mounted thereon, of a bearing tube held between the said frame plates, a centrifugal pump having a feed pipe within said bearing tube, and pump tubes connected with the feed pipe and extending laterally within the casing and provided at their outer ends with means for retarding the discharge of water, substantially as set forth.

3. The combination with a casing and frame plates mounted thereon, of a bearing tube held between the frame plates and provided with a ball cup and a centrifugal pump operating within the casing and having a feed tube extending upwardly through the bearing tube, and means on the feed tube above the ball cup; and forming a bearing for the balls in the ball cup and balls in the cup, substantially as set forth.

4. The combination in a pump substantially as described, of pump tubes, valves seating against the outer ends of said tubes, springs carrying said valves, and adjusting springs connected with said valve springs.

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Witnesses:
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