D. V. BURRELL.

CENTRIFUGAL PUMP.

APPLICATION FILED JULY 12, 1909.

949,215. Patented Feb. 15, 1910.

Fig. 1.

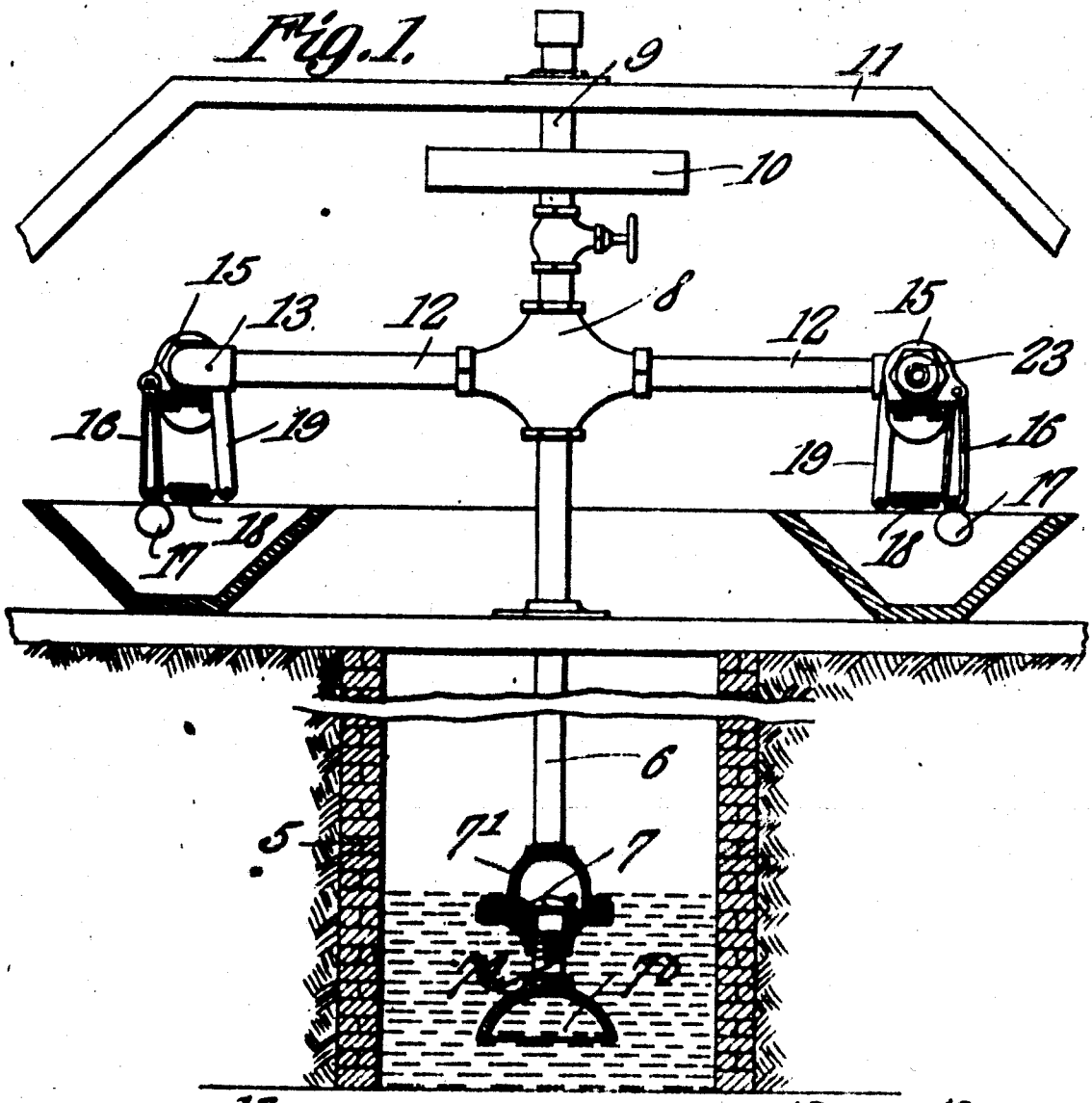

Fig. 3.

Fig. 2.

Witnesses.

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DELAVAN V. BURRELL, OF ROCKY FORD, COLORADO.

CENTRIFUGAL PUMP.

949,215. Specification of Letters Patent. Patented Feb. 15, 1910.

Application filed July 12, 1909. Serial No. 507,164.

To all whom it may concern:

Be it known that I, DELAVAN V. BURRELL, a citizen of the United States, residing at Rocky Ford, in the county of Otero and State of Colorado, have invented a new and useful Centrifugal Pump, of which the following is a specification.

This invention relates to that class of centrifugal pumps characterized by a series of revolving tubular arms connected to a suction pipe, the centrifugal force created by the revolving parts causing the water to rise in the suction pipe, from which it flows into the arms, and is discharged at the outer ends thereof. A pump of this type is disclosed in my pending application, filed May 6th, 1909, Serial Number 494,263, and the present invention is an improvement thereon.

The invention relates more particularly to the discharge arms of the pump, its object being to so construct said arms that they discharge the water in the opposite direction to that in which they are moving, in order to avoid air resistance.

Another object is to provide a structure which permits the use of a suction pipe and discharge arms of large diameter, thus reducing friction.

The invention also has for its object to provide means for automatically shutting off the flow from the arms when the speed drops below a predetermined point, in order that the priming may be retained.

With the herein stated objects in view the invention consists in a novel construction and arrangement of parts, to be hereinafter described and claimed, reference being had to the drawing hereto annexed, in which:—

Figure 1 is a vertical sectional view of the pump. Fig. 2 is a plan view, and Fig. 3 is an end view of one of the discharge arms.

Referring more particularly to the drawing, 5 denotes a well or other suitable source of water supply into which the suction pipe 6 extends, said pipe being provided with a foot valve 7 from the casing 7′ of which a short tube or nipple 7ª depends. At the lower end of this nipple is a bell 7ᵇ which is intended to be submerged in the water at all times, while the valve is located above the same so that it may whirl freely in the air above the water when the level of the water drops leaving only the bell in the water. The shape of the bell permits it to rotate with very little resistance. The construction of the valve is such that when the valve is open, the flow of the water will be unobstructed.

The upper end of the suction pipe carries a hollow head 8 into which the priming pipe 9 extends, said pipe being in axial alinement with the suction pipe. The connection between the head and the pipes is such that they will rotate together. On the pipe 9 is mounted a pulley 10, which carries a drive belt by means of which the pump is operated from an engine or other suitable source of power.

At 11 is indicated a suitable frame-work, provided with bearings in which the parts 6 and 9 are supported. At 12 are indicated the tubular discharge arms or pipes of the pump, they being rigidly connected to the head 8 and extending radially therefrom, in a horizontal plane. To the outer end of each pipe is connected an elbow 13, which extends back in a direction opposite to that in which the arms travel. To the elbow is connected, by means of a nipple 14, a gate valve 15, of ordinary construction, the operating lever of which is indicated at 16. On the free end of the lever 16 is mounted a weight 17, and to said end is also connected one end of a coiled spring 18, the other end of which is connected to an arm 19 adjustably secured to the nipple 14, by means of set screws 20 carried by a collar 21 encircling the nipple, the arm 19 being connected to this collar.

To the discharge end of the valve 15 is connected, by means of a nipple 22, a nozzle 23, the discharge end of which is contracted.

In operation, the spring 18 holds the lever 16 down until the centrifugal force caused by the whirling of the pipes 12 is sufficient to overcome the tension of the spring, and to swing the lever with its weight 17 outwardly and upwardly. The lever is so arranged that this upward swinging movement opens the valve 15, the closing of the valve being effected when the lever swings in the opposite direction. The spring will hold the lever down, and thus keep the valve closed until the centrifugal force is sufficient to lift the water. When the speed of the pipes decreases, the spring draws the lever down, thus closing the valve and retaining the priming. The nozzles 23 may be of such size as to reduce the flow of water to the capacity of the engine, or the well, or to the quantity desired to be lifted. The nozzles

are presented in the opposite direction to that in which the pipes are moving, in view of which air resistance is avoided and a high efficiency is attained. The employment of the nozzles 23 permits the use of a large suction pipe and discharge pipes, thus causing very little friction by the passage of the water through the pipes, the main point of friction being at the discharge end of the nozzle, which is very short, thus resulting in a very high efficiency. The water in the pipes which is not being discharged, is carried around, which has a fly-wheel effect, and does not materially add to the power required to operate the pump.

What is claimed is:—

1. A centrifugal pump comprising a suction pipe in communication at one end with the source of supply, radially extending discharge pipes communicating with the suction pipe, a valve for controlling the flow from each of the discharge pipes, an operating lever connected to the valve, said valve being actuated by a swinging movement of said lever, a spring connected at one of its ends to the lever, and opposing the swing of the lever in a direction to open the valve, an arm to which the other end of the spring is connected, said arm being carried by the discharge pipe, and being adjustable thereon to vary the tension of the aforesaid spring, and means for rotating the discharge pipes.

2. A centrifugal pump comprising a suction pipe in communication at one end with the source of supply, radially extending discharge pipes communicating with the suction pipe, a valve for controlling the flow from each of the discharge pipes, an operating lever connected to the valve, said valve being actuated by a swinging movement of said lever, a spring connected at one of its ends to the lever and opposing its swing in a direction to open the valve, an adjustable support for the other end of the spring for varying the tension thereof, and means for rotating the discharge pipes.

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

DELAVAN V. BURRELL.

Witnesses:
M. L. ANDERSON,
R. W. BONZY.