

April 13, 1937.

W. J. CONERY ET AL

2,077,213

PUMP

Filed April 20, 1936

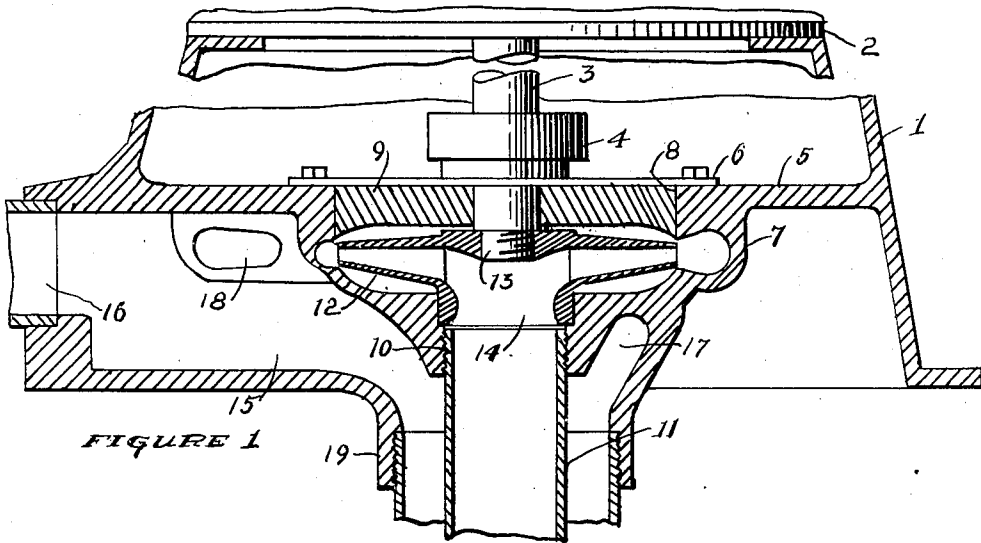


FIGURE 1

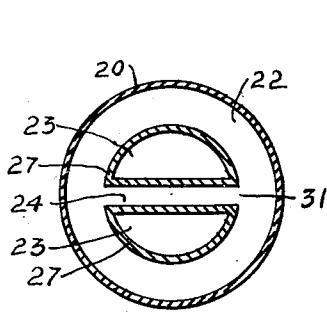


FIGURE 3

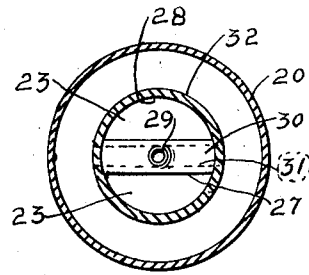
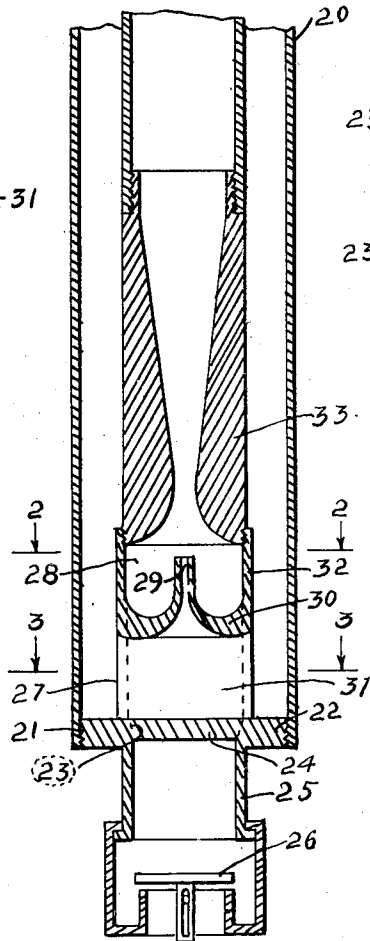


FIGURE 2

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## UNITED STATES PATENT OFFICE

2,077,213

PUMP

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Application April 20, 1936, Serial No. 75,366

1 Claim. (Cl. 103—5)

The present invention relates particularly to centrifugal pumps of the type used for pumping water from wells.

It is one object of the present invention to provide a pump of the character indicated that will be economical to manufacture, simple in form and construction, that has consistently low operating costs, and that is durable, compact, and highly efficient in its practical application.

It is also an object of the invention to provide a pump of the character indicated wherein the head of water in a well casing is built up to a higher pressure by impeller means within the pump and utilized to induct water into the pump from the well and feed the same to the said impeller means.

These objects are attained by means of the mechanism illustrated in the accompanying drawing, in which,—

Figure 1 is a vertical section through a pump embodying the invention, with parts broken away.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a section on line 3—3 of Figure 1.

Referring now more particularly to the drawing, the pump head is shown in part at 1, with the base plate of the motor operating the pump shaft indicated at 2, and the shaft at 3, with the shaft bearing at 4, supported on plate 5 of the head as at 6.

Depending from plate 5 and in concentric relation to the axis of the shaft is an impeller bowl 7, the upper portion of the bowl having an opening 8 therein closed by part 9 of the bearing 4, and its lower portion having a threaded opening 10 to receive the upper end of pipe 11 as shown. An impeller 12 is disposed within the bowl and is mounted upon and driven by the shaft 3 at 13, the neck of the impeller communicating with the pipe 11 at 14.

The head 1 is provided with a chamber 15 having a discharge outlet at 16 and encompassing the pipe 11 as at 17 in concentric relation thereto, the bowl 7 discharging into the said chamber as at 18.

Threaded into the neck portion 19 of head 1 and encompassing pipe 11 is a casing 20, and an injector is threaded into the lower end of the casing 20 as at 21.

The injector comprises a plate 22 having two nearly semicircular passages 23 formed there-through, these passages being separated by a cross bar 24. The plate also has a depending annular flange 25 formed thereon in concentric relation to its axis and communicating with said passages 23, a check valve at 26 permitting the flow of water into and through said passages.

The passages 23 are projected upwardly by means of enclosing walls 27 formed on plate 22

and the cross bar 24 and discharge into a circular chamber 28.

In the center of the chamber is disposed an upwardly directed injector nozzle 29, this nozzle rising from a part 30 forming the top of the passage 31 between the inner walls 27.

Inserted between and connecting the wall 32 enclosing chamber 28 and the lower end of pipe 11 is a Venturi tube 33.

In operation the impeller 12 receives water from the pipe 11 and discharges it into the chamber 15, filling the chamber 15 and the casing 20, the water not used as hereinafter described being discharged at 16.

The head of the water in casing 20 will, of course, cause it to flow through passage 31 to be discharged in a jet from nozzle 29, but the force of this jet is increased by the pressure built up in chamber 15 through the operation of the impeller.

The normal operation of impeller 12 serves to move the water upwardly and out of pipe 11 thereby relieving the pressure therein, while the jet operating as described serves to lift water through passages 23 and chamber 28 to the pipe 11.

An important feature of this assembly is that the pipe 11 is completely under water when the pump is in operation so that no leakage of air into the pipe can possibly take place.

It is to be understood, of course, that while but one specific embodiment of the invention is herein shown and described changes in form, construction, and method of assembly and operation may be made within the scope of the appended claim.

We claim:

A pump of the character described comprising, a pump head having a motor mounted thereon provided with a vertically disposed drive shaft extending downwardly into said head, an impeller mounted on said shaft, an impeller bowl formed in said head to encompass the impeller, a discharge chamber formed in the head to encompass the impeller bowl and to receive water discharged therefrom and a depending casing mounted on the head in open communication with said chamber, a feed pipe depending from the impeller bowl in open communication therewith and concentrically disposed within said casing, and an injector inserted between the lower ends of the casing and feed pipe, the injector including a Venturi tube communicating with the pipe and the exterior of the casing, and an ejector nozzle communicating with the discharge chamber between the pipe and casing.

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