Feb. 20, 1934. S. H. HOBSON 1,947,551

PUMP UNIT

Filed Aug. 4, 1931 2 Sheets-Sheet 1

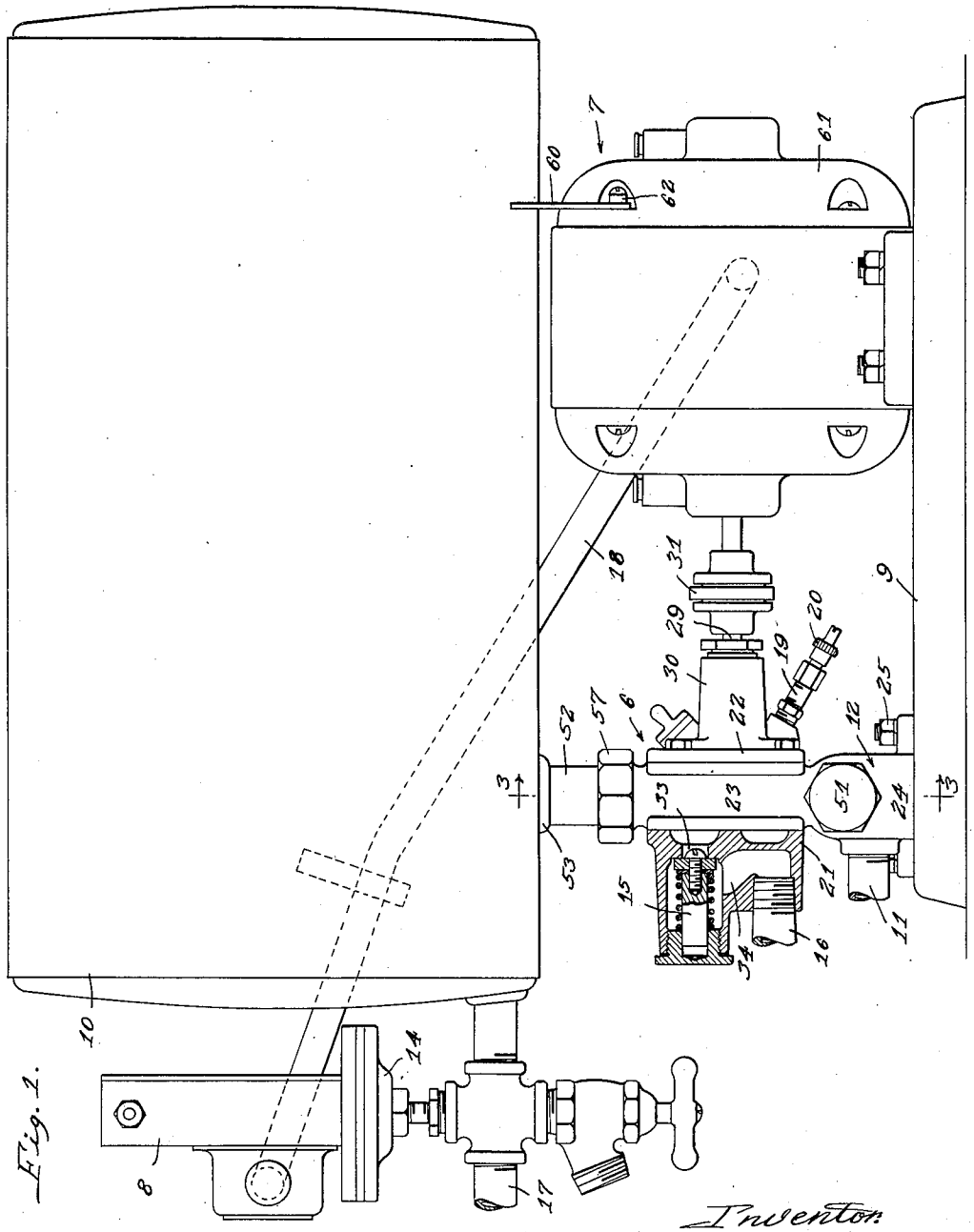


Fig. 1.

Inventor:
Stanley H. Hobson
By
Wilson, Dowell, McCanna & Rehm
Attys.

Feb. 20, 1934. S. H. HOBSON 1,947,551

PUMP UNIT

Filed Aug. 4, 1931 2 Sheets-Sheet 2

Fig. 2.

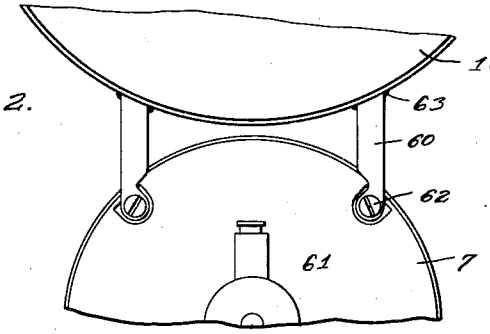
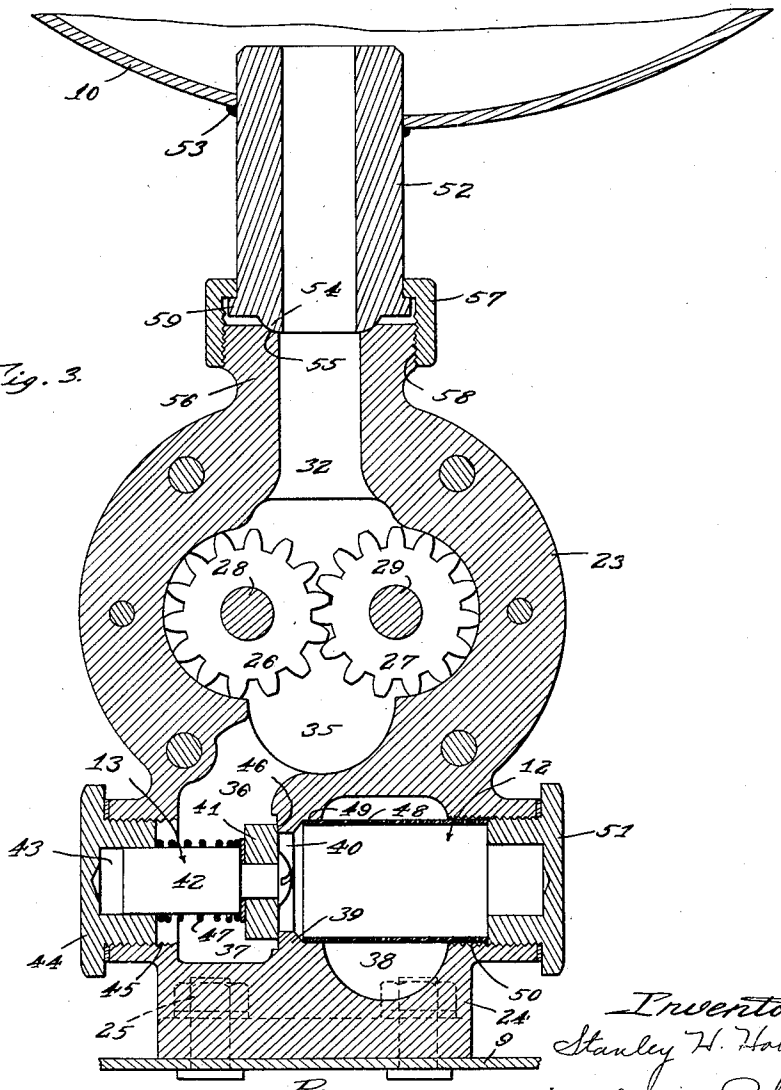


Fig. 3.



Inventor:
Stanley H. Hobson
By Wilson, Dowell, McCanna & Rehm
Attys.

Patented Feb. 20, 1934 1,947,551

UNITED STATES PATENT OFFICE

1,947,551

PUMP UNIT

Stanley H. Hobson, Rockford, Ill., assignor to Geo. D. Roper Corporation, Rockford, Ill., a corporation of Illinois

Application August 4, 1931. Serial No. 555,104

1 Claim. (Cl. 103—220)

This invention relates to a pump unit designed for domestic water system installations.

The principal object of my invention is to provide a pump unit in which all of the parts, namely, the pump, the electric motor for driving the same, the storage tank, and the automatic pressure regulator, are assembled together in a predetermined desired relationship, so that when the unit arrives on the job, nothing remains to be done other than to connect the supply and service pipes with the unit and connect the motor with the power circuit. This standardizes water systems and eliminates all of the otherwise mysterious service troubles, so that the manufacturer or dealer can give intelligent advise to remedy any trouble that might arise, and is not put to a needless and endless amount of trouble and expense.

Another object of the invention has reference to the provision of a check valve and strainer embodied directly in the base portion of the housing of the pump so as to eliminate a multiplicity of fittings and pipe connections and make for greater compactness and neater appearance. The construction also has the advantage of making the check valve and strainer quickly and easily accessible for inspection or replacement.

Other objects and advantages will appear in the course of the following detailed description, in which reference is made to the accompanying drawings, in which—

Figure 1 is a side view of a pump unit embodying my invention;

Fig. 2 is a fragmentary end view illustrating the means for supporting the tank on the motor, and

Fig. 3 is an enlarged cross-section on the line 3—3 of Figure 1.

Similar reference numerals are applied to corresponding parts throughout the views.

The pump unit of my invention, as may be gathered from the foregoing, is self-contained, and arranged to be electrically driven and automatically controlled, so as to start and stop of itself. It is primarily designed and intended for domestic use to furnish water under pressure to all faucets to correspond to city water service, running water being supplied to the kitchen sink, bathroom and laundry, as well as to places outside the house, as for example, stock tanks, etc., in farm installations. The particular pump utilized with this unit adapts the same to use for shallow driven well installations, or dug wells, cisterns, etc. Briefly stated, the unit comprises a pump 6, electric motor 7 for driving the same, and an automatic pressure regulator 8, all mounted on a base 9 together with a storage tank 10. Water from the well or cistern is drawn by the pump through a supply pipe 11 and strainer 12 and check valve 13 and stored in the tank 10 under a pressure of say from twenty to thirty pounds per square inch. The pressure regulator 8 is of a standard type having a diaphragm in the casing 14 arranged to complete the circuit for the motor 7 when the pressure in the tank, by reason of water having been drawn therefrom, has dropped to say twenty pounds per square inch, and also arranged to break the circuit when, by reason of operation of the pump and replacement of the water supply in the storage tank, the pressure therein has been raised to say thirty-five pounds per square inch, it being understood that a head space for trapped air is left in the tank to permit pressure to be built up therein in the manner described. A relief valve is incorporated in the face plate of the pump 6 at 15, and in case the pressure regulator 8 fails for any reason to function properly and the pressure in the tank builds up beyond a predetermined limit, the relief valve opens and allows water to be exhausted from the tank through a waste pipe 16 leading to the sewer or any suitable waste receptacle. Water is supplied to the service system through the pipe 17 leading from the storage tank. This much description is enough to give a general understanding of the unit of my invention and to show that it is entirely self-contained, it being a very simple matter to install the unit in a domestic water system inasmuch as it is only necessary to connect the supply pipe 11 and service pipe 17 therewith, and lead the pipe 16 therefrom to the proper point for discharge of waste water, and connect the wires of the power circuit with the regulator 8, which, as indicated at 18, has wires leading therefrom through a conduit to the motor 7. Immediately after the unit has been set up for use and the storage tank has been filled, a pneumatic valve 19 communicating with the tank 10 through the suction side of the pump 6 has the cap 20 thereof removed to allow air to be drawn in with the water and forced into the tank. When the proper amount of air has been taken in, the cap is replaced and the unit is then ready for the fully automatic operation above described. I shall now proceed to a description of the various novel features of construction and arrangement incorporated in the unit in accordance with my invention.

The pump 6 has face plates 21 and 22 bolted as indicated to the opposite sides of the cast iron housing 23. The base portion 24 of the pump

housing is bolted to the base 9, as indicated at 25. An idler gear 26 meshes with a driven gear 27 in the pump housing, the two gears being preferably of the herringbone type and being pressed onto shafts 28 and 29 received in bearings in the face plates, the one end of the shaft 29 being extended through a bearing 30 and stuffing box to permit of a direct flexible coupling connection with the electric motor 7, as indicated at 31. The similarity to the copending application lies chiefly in the provision of the relief valve 15 directly in the face plate 21 in communication with the discharge chamber 32 through the port 33 in the face plate and arranged to establish communication between the discharge chamber and the waste pipe 16 through the passage 34 also provided in the face plate. The check valve and strainer in the copending application, while provided directly in the pump housing, are not disposed in the same advantageous relationship as the check valve 13 and strainer 12 herein shown. It will be observed that the suction chamber 35 below the pumping gears has communication through a passage 36 with the valve chamber 37 in one side of the base 24 of the pump housing. A strainer and sediment chamber 38 is provided in the other side of the base portion 24 of the pump housing, the two chambers being separated by a partition wall 39. A valve port 40 in the wall 39 affords communication between the two chambers. The check valve 13 which seats outwardly is provided in the chamber 37 by a disc 41 of fiber, bakelite, or the like, mounted as shown, on a metallic stem 42 slidable freely in a bore 43 formed in a plug 44 threaded as shown into a hole 45 provided in one side of the base 24. A smooth seat is machined on the wall 39 for the valve disc 41, as appears at 46. A light coiled compression spring 47 fits around the stem 42 between the disc 41 and the plug 44, whereby normally to urge the valve toward the seat to close the port 40. The partition wall 39, which as just described provides a valve seat on one side thereof, for the check valve 13, provides an abutment on its other side for the inner end of a perforated sleeve 48 constituting the filtering medium of the strainer 12, and which fits snugly at its one end in a pilot bore 49 next to the port 40, and at its other end is likewise snugly received in the threaded hole 50 into which the plug 51 is threaded from the side of the base 24 to close the strainer chamber 38 and serve by abutment with the outer end of the strainer to clamp the same in position between the wall 39 and the plug, in a manner thought to be self-evident. The strainer chamber 38 has the supply pipe 11 communicating therewith so that the water is first caused to pass through the strainer 12 before it is allowed to pass the check valve 13 and be discharged by the action of the pumping gears into the storage tank. It is no doubt evident that the location of the check valve right next to the pumping gears has the advantages of keeping the pump primed, eliminating water hammer action, and preventing air trapping, these advantages coming also as a result of the location of the storage tank directly above the pump. The end to end arrangement of the check valve and strainer transversely in the base portion 24 of the pump housing obviously makes for the best obtainable compactness, and the partition wall is thereby made to serve the double purpose of providing a seat for the valve on one side and an abutment for the strainer on the other. The plugs 44 and 51, it will be observed, are made interchangeable, the advantage of which is obvious.

The tank 10 is supported at one end on the pump 6 by means of a nipple 52 welded or otherwise suitably secured in the bottom of the tank, as at 53. The lower end of the nipple has a rounded projection 54 arranged to fit in a rounded seat 55 provided in the head 56 of the pump housing, whereby to permit a good water-tight joint to be made between the tank and the pump, regardless of the exact position which the nipple assumes with relation to the pump housing. A union nut 57 threads on the externally threaded portion 58 of the pump head 56 and cooperates with the annular shoulder 59 provided on the nipple 52 to complete the connection between the pump and tank. It is obvious that the connection, although composed of a few parts which do not require much accurate machining, and are, therefore, rather inexpensive, is sufficient to support the tank rigidly and without danger of any leakage. After the connection between the pump and tank has been completed, a pair of sheet metal arms 60, which are pivoted relative to the bell housing 61 of the motor 7 on the bolts 62 that hold the bell housing in place, are swung into position in abutment with the bottom of the tank and welded thereto, as at 63. The bolts 62 can then be tightened and the tank is then not only rigidly supported by the pump at one end, but also rigidly supported at its other end by the motor. This eliminates the necessity for any separate supporting means and results in an appreciable saving in cost.

I claim:

In a pumping apparatus of the character described, the combination with a supply pipe and a service pipe, of a pumping apparatus comprising in a unitary assembly, a base, a storage tank supported in elevated position thereon and communicating with the service pipe, a pump disposed below the tank on the base with its discharge portion on the upper end thereof and directly connected with the bottom of the tank, the suction portion of said pump being at the bottom thereof and connected with the supply pipe, there being a sediment chamber provided in the suction portion of said pump and the supply pipe communicating with an inlet opening provided in the side wall of said chamber, a hollow cylindrical strainer horizontally disposed in said chamber in transverse relation to the supply pipe, there being a seat provided on one side wall of said chamber around an outlet opening and said strainer having abutment at its inner end with said seat, and a closure for another opening provided in the wall of said chamber opposite the outlet opening serving to hold the strainer in place but permit removal for cleaning of the strainer and sediment chamber.

STANLEY H. HOBSON.