July 3, 1923. 1,460,982

C. E. RECORDS

DOMESTIC WATER SERVICE SYSTEM

Filed March 31, 1922 2 Sheets-Sheet 1

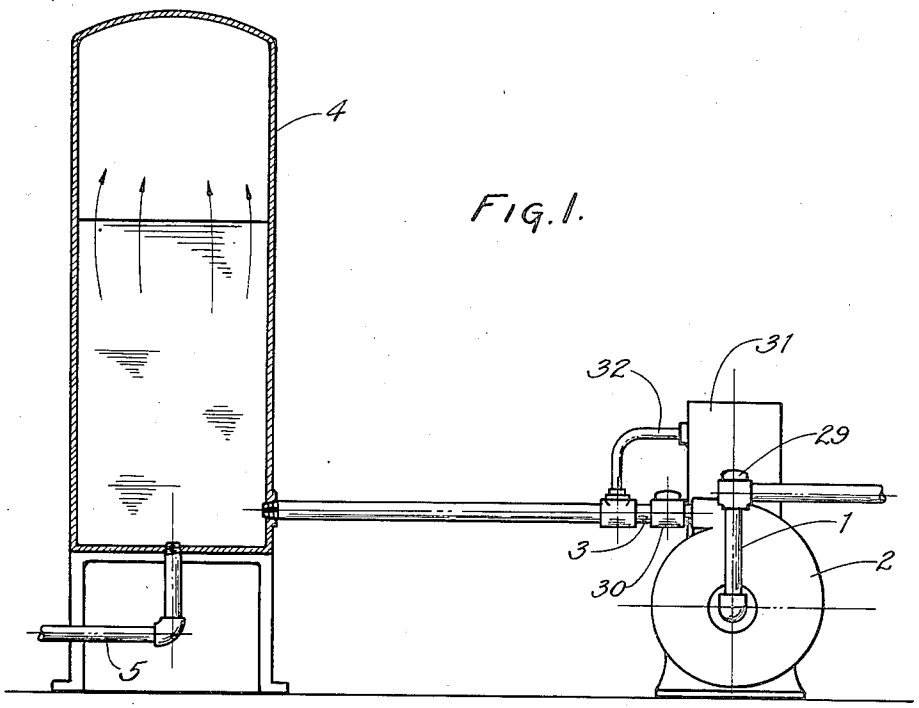
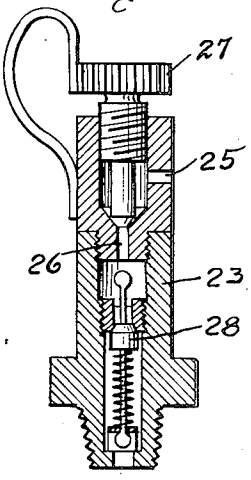


FIG. 1.

FIG. 4.



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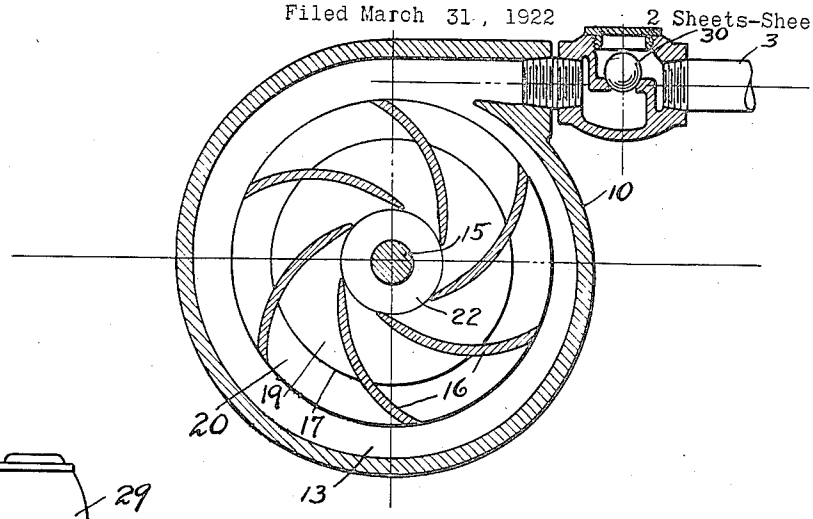


Fig 3

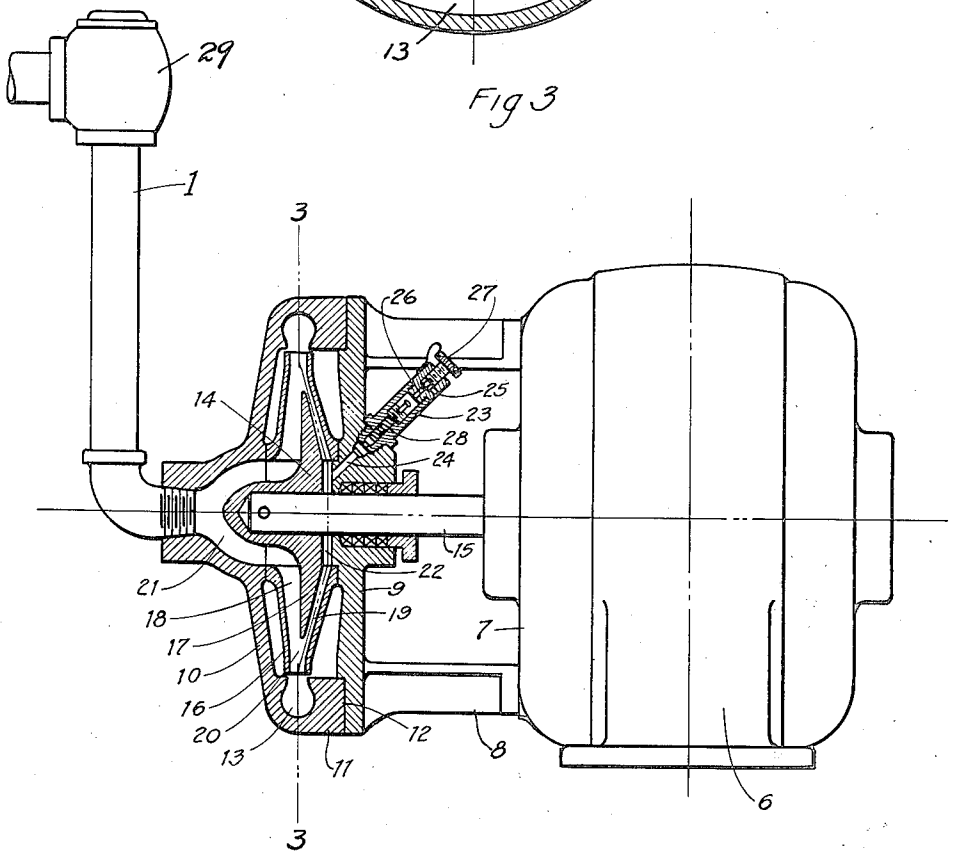


Fig 2

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INVENTOR

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Patented July 3, 1923. 1,460,982

UNITED STATES PATENT OFFICE.

CHESTER E. RECORDS, OF ANDERSON, INDIANA.

DOMESTIC WATER-SERVICE SYSTEM.

Application filed March 31, 1922. Serial No. 548,449.

To all whom it may concern:

Be it known that I, CHESTER E. RECORDS, a citizen of the United States of America, residing at Anderson, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Domestic Water-Service Systems, of which the following is a specification.

This invention relates to an improvement in domestic water service systems, wherein a tank or container is adapted to supply the domestic needs.

It is usual in such systems to supply the tank from a suitable source thru the use of a pump, the head of water from the tank depending largely upon the tank elevation. The present invention is designed, thru a particular type of pump, to force into the tank with the water delivered by the pump, a quantity of air under pressure, which will accumulate in the tank as a pressure medium to force the water therefrom when needed.

The characteristic feature of the present invention is the provision of a pumping element, wherein the water and air are combined and delivered from the pump to the tank in a single or combined stream; the pump construction providing means for regulating the quantity of air admitted; and the system providing proper control means for automatically cuttting in or cutting out the pump in accordance with the pressure, and for preventing tank pressure on the pump when the latter is idle.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a view in elevation, illustrating more or less diagrammatically the improved system.

Fig. 2 is a sectional view partly in elevation, showing the motor and improved pump operated thereby.

Fig. 3 is a vertical section on the line 3—3 of Fig. 2.

Fig. 4 is a sectional detail of the air valve.

In the drawings, the general system is shown as a service pipe 1, leading to a pump 2 and a supply pipe 3 leading from the pump to the domestic tank 4, from which the house service pipe 5 leads.

The invention is particularly concerned with the construction of the pump 2, such being shown as operated by an electric motor 6, from one cover plate 7 of which extends removably connected brackets 8 supporting at their outer ends, preferably integrally, an inner wall 9 of the pump housing. The opposite wall 10 of the housing has an edge flange 11 seating in a shouldered portion 12 of the wall 9, the annular fluid pressure channel 13 of the pump being formed in the flange 11.

The impeller 14 operating within the housing between the walls 9 and 10 is secured directly upon the shaft 15 of the motor 6, this impeller comprising a series of particularly formed blades 16 radiating in curved relation from the hub of the impeller to the inner surface of the flange 11. These blades are of hollow formation and divided for a portion of their lengths by a partition 17, forming on one side a water channel 18 and on the opposite side an air channel 19. These channels beyond the end of the partition 17 merge into the main blade channel 20. The service pipe 1 leads thru the wall 10 of the pump housing into an annular channel 21, with which the water side channels 18 of the impeller blades communicate. The air channels 19 of these blades communicate with an annular air pocket 22, between the hub of the blade and the bearing portion of the rear wall 9 of the housing.

An air valve 23 shown in detail in Fig. 4 communicates with the air pocket 22 thru a port 24 in the wall 9. This air valve which comprises a removable casing, preferably constructed in sections as shown, has a lateral port 25 open to the atmosphere and a longitudinal port 26 controlled by a manually operable valve 27. A construction similar to the well known inner tube tire valve is employed, including a spring pressed valve 28 is arranged in the lower portion of the channel of the air valve, this port valve 28 serving to prevent outflow of water thru the air valve when the pump is idle, and also serving to hold the air within the pump when the pump is idle, so that the pump may be said to be primed, that is supplied with air and water ready for initial action.

A check valve 29 is arranged in the service pipe 1, to prevent return-flow of the water, and a check valve 30 is arranged in the supply pipe 3 immediately adjacent the pump, this latter check valve serving to re-

lieve the pump of tank pressure while the pump is idle, and thus prevent undue load on the motor in starting. A pressure switch 31 is arranged above the pump, this switch being operated and controlled by pressure in the supply pipe 3, the water under pressure being delivered from said supply pipe beyond the check valve 30 to the pressure switch by a pipe 32. The pressure switch which may be of any desired type is designed to be controlled by the pressure of the fluid in the pipe 3, the switch being set so that at a predetermined pressure the operating circuit to the motor 6 is open, any pressure less than the predetermined pressure serving to close this circuit and start the pump thru the motor.

From the above construction, it will be apparent that in the operation of the pump, water and air are admitted in separate channels and finally mingle in the impeller blades and then forced from the channel 13 thru the supply pipe 3 to the tank 4. The air contained in the fluid stream will of course accumulate above the water in the tank and operates as a pressure medium to cause the water to flow thru the house service pipe 5 while the pump is idle.

The particularly important feature of the present invention is the provision of a pump built conjointly with the motor and peculiarly adapted to simultaneously deliver air and water to the household tank, the admission of either water or air being independently controlled, in order that their co-mingling in a final stream will introduce with the water in the tank a sufficient quantity of air to maintain a pressure upon the body of water in the tank. It is to be particularly noted that the pump and motor are substantially a unit, in that the base of the motor serves as a base and support for the pump, and the motor shaft is continued to provide the pump shaft.

What I claim is:

1. A pump for pressure systems, including a casing, an impeller therein having independent blades, each of said blades being interiorly formed to provide a water channel and an air channel, these channels delivering into a main channel at the end of the blade, the impeller having a hub spaced from the casing at one end to provide an air pocket with which the air channels communicate, means open only to inward flow for admitting air to said air pocket, the opposite end of the hub having an annular space in communication with a water supply, said annular space being in open communication with the water channels of the blades, the casing having a fluid-pressure outlet channel in substantially direct open communication with the main channels of the blades, and means for operating the impeller.

2. A pump for pressure systems, including a motor, brackets secured to and extending from the motor, a pump casing carried by said brackets, the motor having a main shaft extended through one wall of the casing, an impeller mounted within said casing and having a hollow hub secured upon the motor shaft, the shaft maintaining the impeller hub spaced from one wall of the casing to provide an air pocket, the end of the hub opposite the air pocket being formed with an annular water channel, and means for combining and delivering air from the air pocket and water from the water channel in the operation of the impeller.

3. A pump for pressure systems, including a casing, an impeller therein having independent blades, each of said blades being interiorly formed to provide a water channel and an air channel, the air channel being of less sectional area than the water channel, these channels delivering into a main channel at the end of the blade, the impeller having a hub spaced from the casing at one end to provide an air pocket with which the air channels communicate, means open only to inward flow for admitting air to said air pocket, the opposite end of the hub having an annular space in communication with a water supply, said annular space being in open communication with the water channels of the blades, the casing having a fluid-pressure outlet channel in substantially direct open communication with the main channels of the blades, and means for operating the impeller.

4. A pump for pressure systems, including a casing, an impeller therein having independent blades, each of said blades being interiorly formed to provide a water channel and an air channel, these channels delivering into a main channel at the end of the blade, the impeller having a hub spaced from the casing at one end to provide an air pocket with which the air channels communicate, a spring pressed valve carried by the casing and opening under suction in the air pocket to admit air thereto, the opposite end of the hub having an annular space in communication with a water supply, said annular space being in open communication with the water channels of the blades, the casing having a fluid-pressure outlet channel in substantially direct open communication with the main channels of the blades, and means for operating the impeller.

5. A pump for pressure systems, including a casing, an impeller therein having independent blades, each of said blades being interiorly formed to provide a water channel and an air channel, these channels delivering into a main channel at the end of the blade, the impeller having a hub spaced from the casing at one end to provide an air pocket with which the air channels commu-

nicate, means open only to inward flow for admitting air to said air pocket, the opposite end of the hub having an annular space in communication with a water supply, said annular space being in open communication with the water channels of the blades, the casing having a fluid-pressure outlet channel in substantially direct open communication with the main channels of the blades, said fluid-pressure channel being of gradually-increasing area toward the outlet, and means for operating the impeller.

In testimony whereof I affix my signature.

CHESTER E. RECORDS.