

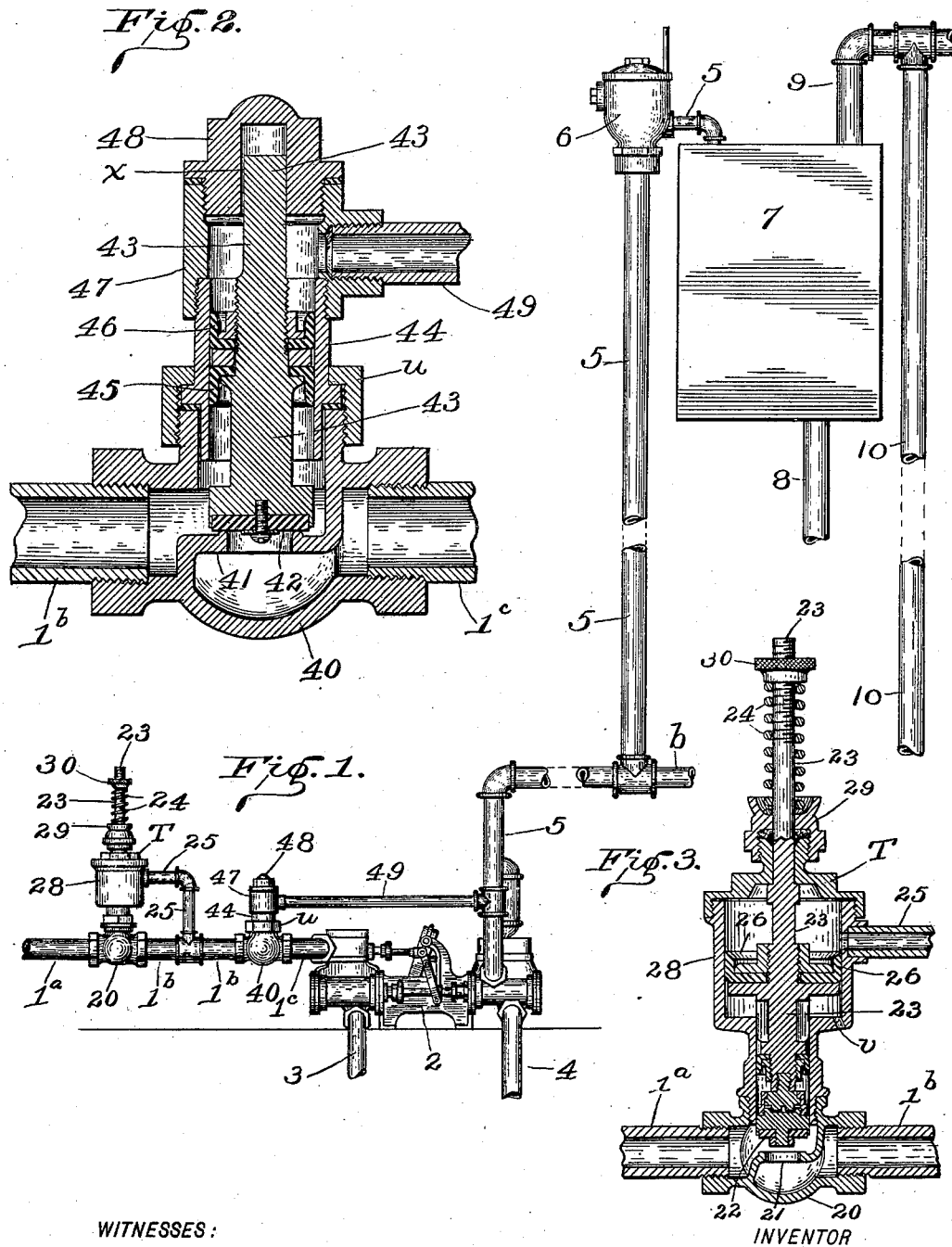
No. 676,214.

Patented June 11, 1901.

C. ANESHAENSEL.
WATER PUMPING APPARATUS.

(Application filed Nov. 17, 1900.)

(No Model.)



WITNESSES:

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WATER-PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 676,214, dated June 11, 1901.

Application filed November 17, 1900. Serial No. 36,889. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ANESHAENSEL, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Water-Pumping Apparatus, of which the following is a specification.

My present invention consists, generally speaking, in improvements in that shown and described in my Letters Patent No. 660,239, granted October 23, 1900, and relates to that class of apparatus wherein a water-motor is used for pumping water for household or such like purposes.

As is well known to those familiar with the subject, one great difficulty attending the use of water-motors in pumping water for domestic purposes has been that the motor is kept continuously under pressure from the water which drives it, and this occasions incessant wear upon the valves of the motor, which rapidly destroys its efficiency. This trouble is aggravated by the fact that for a considerable portion of the time such a motor is driven slowly back and forth by the small amount of water which passes through it when not in very active operation, at which times, as those familiar with the subject well know, such sand or grit as may be carried by the water remains in the valves more persistently and cuts said valves more seriously than when it is rapidly washed through, as when the motor is in full operation. This difficulty was overcome in large measure by the valve apparatus forming the subject-matter of my said Patent No. 660,239. I have discovered that still better results may be attained by providing means to both regulate the speed of the pump when the same is in operation and also to shut off the water from the pump completely, and thus stop its motion altogether except during the time water is being drawn for use from the pipes or plumbing system supplied by the pump. Such is the object of my present invention, which is accomplished by incorporating in the system an additional valve and somewhat changing the connections, as will appear from the accompanying description.

I shall describe my invention as I have applied it in an ordinary household plumbing

system, wherein in operation the water which drives the motor is that usually supplied under city pressure from the waterworks and will therefore be hereinafter denominated the "city" water, while that to be pumped is usually the rain-water from a cistern and will be hereinafter denominated "cistern" water.

Referring to the accompanying drawings, which are made a part hereof and on which similar reference characters indicate similar parts, Figure 1 is a side elevation illustrating in a somewhat diagrammatic manner the essential parts of a household water system embodying my present invention. Fig. 2 is a central vertical sectional view of the valve which I have added to the system shown in said Patent No. 660,239, with fragments of the pipes connected thereto; and Fig. 3, a corresponding section of the water-pressure-controlling valve and which is or may be the same as the valve shown in said patent, although used somewhat differently.

I may state, by way of introduction to the detailed description, that the new valve in question occupies a position in the present system which the valve shown in said patent occupied in the system therein described, while the said valve formerly used has been transferred to a point farther out along the line of pipe leading to the pump and by means of different connections has become a pressure-controlling valve rather than a shut-off valve to the pump, although in operation it many times shuts off completely, as will hereinafter appear.

Water which operates the motor comes from the mains or source of supply through the pipe 1^a 1^b 1^c to the motor 2, and the waste from said motor runs off into the sewer or other place of discharge through the exhaust or waste pipe 3.

The water to be pumped is supplied to the pump-motor through the suction-pipe 4 and is delivered from said pump-motor to the plumbing fixtures or tank, or both, through the pipe 5, which may or may not have branches, as *b*, running to various points, according to the plumbing system employed. I have shown the main delivery-pipe 5 as running through a check-valve 6 to a tank 7, and said tank has a delivery-pipe 8 and a waste or overflow pipe 9, and to the latter, in a mod-

ern plumbing system, I prefer to connect the hot-water safety-pipe or escape-pipe 10. All these matters, however, are matters of choice or preference and are arranged according to the taste of the user or the requirements of the situation to which they are to be adapted. So far the parts are or may be similar to those illustrated in my said former patent, and consequently the description is purposely similar.

The pressure-controlling valve is in itself similar in construction and arrangement to the valve shown in said Patent No. 660,239 and is composed of a valve-shell 20, containing a valve-seat 21, upon which a valve 22 on the lower end of the valve-stem 23 is adapted to rest, said valve-stem being operated in one direction by the spring 24, while it is operated in the other direction by the pressure of water coming in from the portion 1^b of the main pipe through the by-pass pipe 25 into a chamber above the cup-leather 26, carried by the valve-stem. The cup or piston 26 is of larger diameter than the valve 22 and is contained within a correspondingly larger chamber in the shell 28, which is mounted on the neck of the valve-shell 20, as shown, and the top T of which is removable. The stuffing-box 29 above this chamber, through which the valve-stem 23 passes, is preferably cup-shaped at the upper end and is thus well adapted to receive a lubricant, as well as the lower end of the spring 24. The lower side of the chamber below the cup 26 has a small vent *v*, communicating with the outer air, in order that there shall be no air compression within this chamber under said cup to impede its operation. The tension of the spring is regulated by a nut 30. The tension of the spring is so regulated as to hold the valve open until a certain predetermined pressure is reached in that portion 1^a of the pipe outside the valve 20, when, owing to the larger area of the cup 26, the valve 22 will be forced toward or against the valve-seat 21. Thus notwithstanding the variable pressure which may come from the waterworks or source of supply against this valve an equal pressure in the pipe inside the valve may be always maintained, with the result that the water-motor will be driven at a constant speed when in operation, and the excessive wear in said motor which takes place where there are unequal speeds is thus avoided. As heretofore stated, this alone is of considerable advantage in the operation of pumping systems of this character. Pressure-controlling valves alone, however, do not wholly remove pressure from the piston of the pump, and this pressure although reduced will cause the slow or "creeping" motion of the pump above referred to, with the result that such a pressure-controlling valve will from time to time be slightly opened, permitting sufficient water to replace the small quantity consumed by such motion to pass, with the disadvantages above specified. In order to completely remedy this

difficulty, I have incorporated in this system the additional valve, which will now be described. This valve is composed of the shell 40, having the valve-seat 41 and a valve 42 on the lower end of a valve-stem 43, adapted to rest on said valve-seat. Above the shell 40 (and preferably coupled to said shell by a union *u*) is a cylinder 44, within which and carried by the valve-stem are two cup-leathers 45 and 46 of equal diameter, one facing in one direction and the other facing in the other direction. To the upper end of this cylinder is connected another cylindrical structure 47, (which, however, might be a prolongation of the part 44,) and the top of this is adapted to be closed by a plug or cap 48, which contains a central vertical perforation into which the upper end of the valve-stem 43 extends and which serves as a guide to said stem. Said stem is flattened or grooved on one side, as at *x*, so that water may pass freely into and out of the perforation in the cap and the movement of the stem therein not be impeded by suction or friction. To one side of the part 47 is connected a small pipe 49, which is a branch leading from one of the pipes 5, containing the pumped or "cistern" water. As will be readily understood, the cups 45 and 46 being of the same diameter and respectively adapted to receive pressure coming from opposite directions, the valve itself is an absolutely-balanced valve, so that it is at once opened or closed by any excess of pressure coming from one direction or the other. In this connection it is to be noted that the water in entering this valve from the pipe 1^b enters above the valve-seat instead of, as in ordinary valves, below it, so that there is no pressure on the under side of the valve when the same is closed, the pressure being wholly above this lower face of said valve.

It is obvious, with the arrangement described, that the pressure in the pipes of the pumped-water system will immediately upon the opening of a faucet be relieved, so that the valve 42 will rise, permitting water to flow through the pipe 1^a 1^b 1^c to the pump-motor and operate the same and will immediately after such faucets are all closed increase sufficiently to close the valve 42 and shut off the supply of water and stop the pump-motor. Thus the pump-motor can only operate when water is flowing from the plumbing system containing the water which is being pumped, which, as is well known, is commonly but a small fraction of the time, and therefore under ordinary circumstances the pump is at rest and not being worn by far the greater portion of the time, while it is never subject to operation by leakage and the wearing incident to a slow motion, where the passage of water is not sufficient to freely wash out sand and grit which may accompany it. In other words, when the valve 42 is closed the water is completely shut off from the pump-motor, so that there is no pressure at all upon its piston and no opportunity for wear.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a water-pumping apparatus, of a main pipe leading from a source of water-supply to a water-motor where by water is conveyed under pressure to such motor; said motor; a pressure-controlling valve interposed in said pipe whereby pressure of water at the motor is kept regular and constant irrespective of the variations in pressure from the source of supply; a plumbing system into which water is pumped by said water-motor; a shut-off valve interposed in the pipe leading to the motor between the pressure-controlling valve and said motor and adapted to be opened by the pressure in said pipe, and a connection thereto from the plumbing system into which water is being pumped by the motor whereby said valve may be closed; the flow of water to said motor being thus permitted when water is being drawn from the system supplied by the motor and shut off at all other times, substantially as set forth.

2. The combination, in a water-pumping system, of a pressure-controlling valve interposed in the pipe leading to the motor the operation whereof is controlled by a by-pass connecting the upper chamber of said valve to that portion of said pipe inside or beyond said valve, a shut-off valve interposed in said pipe between said pressure-controlling valve and said motor the operation whereof is controlled by a pipe leading to the upper chamber thereof from the plumbing system into which water is pumped by said motor, and said plumbing system into which water is pumped.

3. The combination, in a water-pumping system, of the motor; a pressure-controlling valve in the pipe leading thereto; and a shut-

off valve between said pressure-controlling valve and said motor; said shut-off valve being composed of a suitable shell, a balanced valve therein, and a by-pass leading to the chamber above the valve; the said valve-shell being so constructed and arranged that the water flowing to the motor passes into said shell above the valve-seat and thence down through said valve-seat and out to the motor, whereby when said valve is closed no pressure is exerted by the water which operates the motor to keep the valve open, substantially as set forth.

4. The combination, in a water-pumping system, of the motor, a supply-pipe leading to said motor from a source of water-supply, a plumbing system into which water is pumped by said motor, a shut-off valve interposed in the supply-pipe, and a branch pipe leading from the plumbing system to the chamber of said valve, said valve being adapted to be operated in one direction by the pressure in said supply-pipe and adapted to be operated in the other direction by the pressure in the plumbing system through the branch pipe leading to said valve structure therefrom, and the valve-shell of said shut-off valve being so constructed and arranged that the water flowing to the motor passes in through said shell to above the valve-seat and thence down through said valve-seat and out to the motor, whereby pressure is entirely removed from the under side of the valve when the same is closed.

In witness whereof I have hereunto set my hand and seal at Indianapolis, Indiana, this 14th day of November, A. D. 1900.

CHARLES ANESHAENSEL. [L. S.]

Witnesses:

CHESTER BRADFORD,
JAMES A. WALSH.