

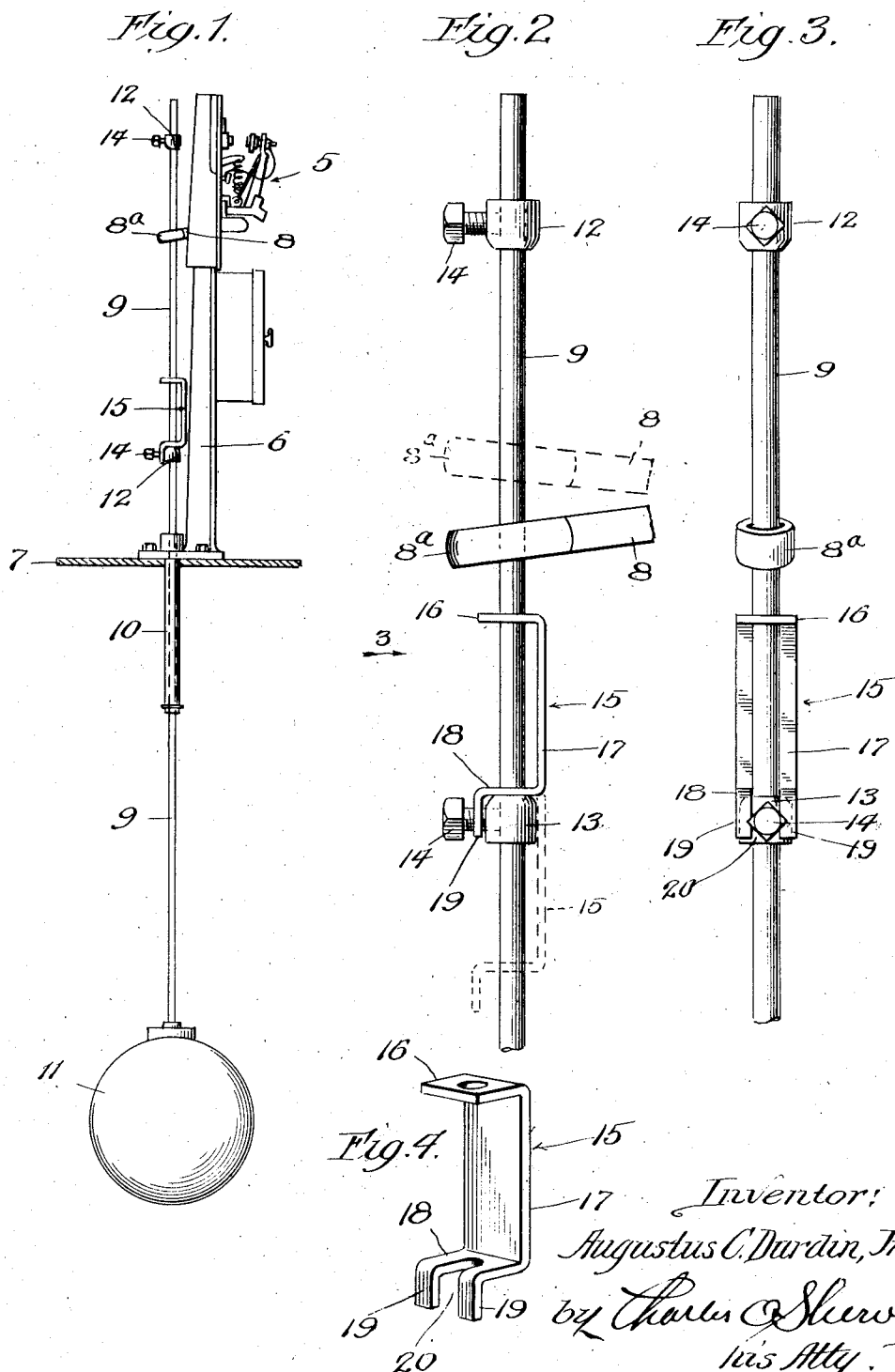
March 25, 1924.

A. C. DURDIN, JR

1,488,237

FLOAT ACTUATED ELECTRIC SWITCH OPERATING MECHANISM

Filed March 7, 1922



UNITED STATES PATENT OFFICE.

AUGUSTUS C. DURDIN, JR., OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO PUMP COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FLOAT-ACTUATED ELECTRIC SWITCH-OPERATING MECHANISM.

Application filed March 7, 1922. Serial No. 541,659.

To all whom it may concern:

Be it known that I, AUGUSTUS C. DURDIN, Jr., a citizen of the United States, and a resident of Chicago, Cook County, and State of Illinois, have invented certain new and useful Improvements in Float-Actuated Electric Switch-Operating Mechanism, of which the following is declared to be a full, clear, and exact description.

This invention relates to float actuated electric switch operating mechanism, and its principal object is to provide simple and novel means operated by a float for actuating an electric switch lever at various positions of the float.

While the invention is applicable to various devices, it has been designed particularly for use in connection with electrically operated bilge pumps. In many cases a pair of bilge pumps are mounted on one support and are used in one and the same basin or well, the object being to guard against failure of a pump to operate at any time. Each pump is connected to and operated by an electric motor, which is controlled by a switch, that is opened and closed by a float rod which is raised and lowered by a float contained in the basin or well. Buttons or collars secured on the float rods are usually provided for engaging the switch lever, but inasmuch as it is desirable to have the motors operate alternately for short periods of time it is necessary for a skilled attendant to adjust the buttons or collars on the float rods, or to provide complicated electric control mechanism for the switches.

One of the main objects of this invention is to provide simple means, whereby a janitor or other unskilled attendant may change the effective point of the float rod (which operates the switch lever to close the switch) so as to cause the switch to be closed when the float reaches either one of two levels and in this manner cause the electric motor to operate the pump at different levels of the water in the basin, well or other place. As a result, two electric operated pumps may be placed in one basin or well and the effective point of one float rod may be set so as to cause the switch of one motor to be closed at one level of water in the basin or well, and the other switch at a higher level. In case the first mentioned pump fails to function, and the water rises above

the predetermined level and reaches the second predetermined level, the other pump will be started. Furthermore, when the first mentioned pump has been in operation for a predetermined length of time, the auxiliary lever actuating device can be readily adjusted, thereby throwing the work on the second mentioned pump and in this way the work can be distributed between the two pumps.

The invention consists in the several novel features hereinafter fully set forth and claimed.

The invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is a side elevation of an electric switch and float operated switch actuating means, with a simple embodiment of the present invention applied thereto; Fig. 2 is a side elevation, upon an enlarged scale, of fragments of the float rod and switch lever, with the auxiliary switch lever actuating device applied to the float rod; Fig. 3 is a front view of the parts seen in Fig. 2, looking in the direction of the arrow 3, and Fig. 4 is a perspective view of the auxiliary switch lever actuating device.

Referring to the drawings, the reference character 5 designates an electric switch which may be used for closing and opening an electric circuit to an electric motor of a motor driven bilge pump. The switch is shown as mounted on a standard 6 which is fastened to and extends up from the cover 7 of a basin, well or other reservoir. The switch lever 8 operates the switch; by swinging the lever 8 upward, it closes the circuit through the switch and by swinging it down, it opens the circuit. The switch lever is shown in full lines in its down position with the circuit open.

The float rod 9 extends through an eye 8^a of the switch lever 8 and is guided to move in a vertical direction in a tubular guide 10, usually projecting downward from the base of the standard 6 and it has a float 11 of the usual hollow ball form, secured to its lower end. The float is contained in the basin or well and is buoyed up by the water therein, and rises and falls with the level of the water. Two spaced buttons or collars 12, 13 are secured to the float rod by set screws 14 and said buttons or collars are placed one above and one below said switch lever 8,

in position to engage said switch lever, when the float rod is raised and lowered sufficiently. The range of movement of the float rod is regulated by the distance between the collars 12, 13. It is understood that when the level of the water rises, the float 11 and therewith the float rod 9 are moved upward and when the level of the water reaches a predetermined place, the collar 13 engages the switch lever 8 and swings it upward upon the continued upward movement of the float, thereby closing the switch and setting the motor and pump in operation. When the water falls to a predetermined level, the collar 12 engages the switch lever 8, and depresses it upon the continued downward movement of the float, thereby opening the switch and stopping the motor and pump. The construction and operation of the parts thus far described in detail are well known to those skilled in the art to which this invention pertains.

Between the switch lever 8 and lower collar 13 is an auxiliary switch lever actuating device 15, which can readily be made effective for actuating the switch lever in advance of the collar 13, that is to say, before the level of the water in the basin or well reaches the place where the collar ordinarily becomes effective in moving the switch lever. Said auxiliary switch actuating device is shown as loosely connected with the float rod 9, and having two effective positions thereon. In the simple form shown, it has a collar portion 16 which surrounds the float rod and fits loosely thereon. Projecting downwardly from the collar portion 16 is a spacing strut 17 which is formed at its lower end with a laterally extending bifurcated part 18, which terminates in two downwardly projecting end portions 19. The notch 20 between the furcations permits the lower end of the auxiliary device to be disengaged from the float rod, and the laterally extending part 18 forms a foot that may rest on the button or collar 13, when the auxiliary device is in one of its adjusted positions. The downwardly projecting end portions 19 of the foot then engage with the side of the collar 13, thereby preventing accidental disconnection of the auxiliary device from the float rod. Said end portions 19 are also adapted to straddle the set screw 14 for the collar 13 and the auxiliary device is thereby held against turning upon the float rod. When the auxiliary device occupies the position just described, the collar portion 16 on the float rod engages the switch lever 8 when the float reaches a predetermined height. To postpone the action of the float rod on the switch lever, the auxiliary device is raised sufficiently to bring the end portions 19 above the collar 13 whereupon the lower end may be readily

disengaged from the float rod, and the upper end or collar portion 16 allowed to drop upon the collar 13. In this position, the auxiliary device remains effective, but it does not engage the switch lever until the float rod has been moved upward a distance above its former effective position, equal to the length of the strut 17. Consequently, the switch is not closed until the water in the basin or well reaches a higher level than before.

It will be understood from the above that when two electric motor operated pumps are used in the same basin or well, and each provided with the control mechanism above described, one may be started in advance of the other, and that by adjusting the auxiliary device as set forth the other pump may be started in advance of the first mentioned one. The wear on the motors and pumps may thereby be equalized in a measure. The adjustment takes but a moment's time and can be done by unskilled persons, without any danger to the mechanism.

More or less variation of the exact details of construction is possible without departing from the spirit of this invention; I desire, therefore, not to limit myself to the exact form of the construction shown and described, but intend, in the following claims, to point out all of the invention disclosed herein.

I claim as new and desire to secure by Letters Patent:

1. Float actuated electric switch operating mechanism, comprising a float and a float rod secured thereto, spaced switch lever operating collars secured thereon, and an auxiliary switch lever operating element mounted on said float rod and connectible with and disconnectible from one of said collars, whereby the float rod may become effective at a plurality of positions.

2. Float actuated electric switch operating mechanism, comprising a float rod, spaced switch lever operating collars secured thereon, and an auxiliary switch lever actuating collar portion loose on said float rod, and having a strut extending down therefrom, there being a bifurcated foot on the lower end of said strut connectible with and disconnectible from one of said collars.

3. Float actuated electric switch operating mechanism, comprising a float rod, spaced switch lever operating collars secured thereon, and an auxiliary switch lever actuating collar loose on said float rod, and having a strut extending down therefrom, there being a bifurcated foot on the lower end of said strut terminating in downwardly projecting end portions, said foot being capable of resting on one of said collars, with said end portions in engagement with the side of said collar.

4. Float actuated electric switch operating mechanism, comprising a float rod, spaced switch lever operating collars secured thereon by set screws, and an auxiliary switch lever operating element, having a collar portion surrounding said switch rod, and a bifurcated foot spaced therefrom and connected therewith, said foot terminating in downwardly projecting end portions, and being adapted to rest upon the lowermost collar with the end portions of the foot straddling the set screw of said collar. 10

AUGUSTUS C. DURDIN, JR.