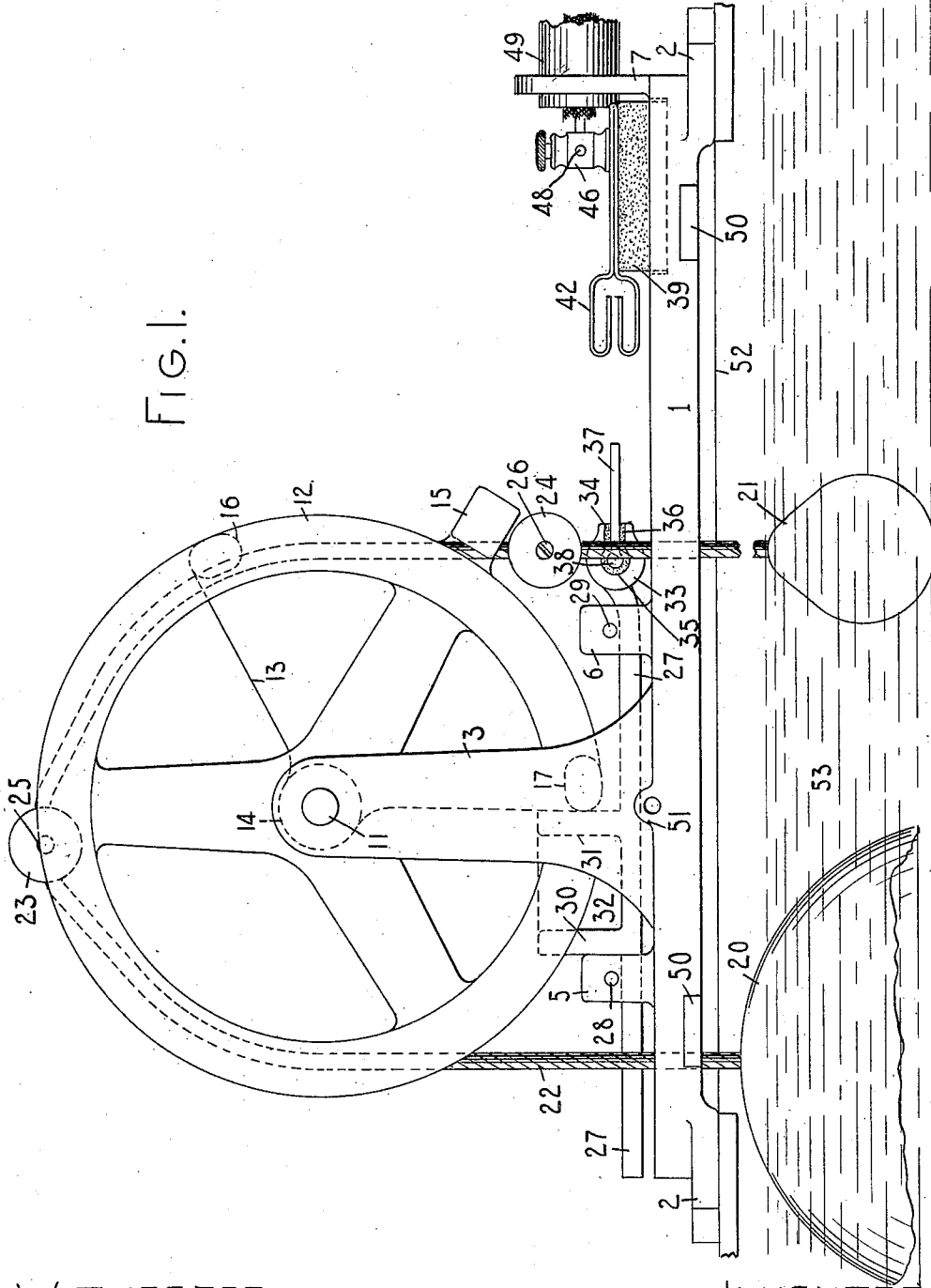


989,414.

H. A. PRINDLE.
ELECTRIC TANK SWITCH.
APPLICATION FILED OCT. 14, 1908.

Patented Apr. 11, 1911.

4 SHEETS-SHEET 1.



WITNESSES:

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INVENTOR:

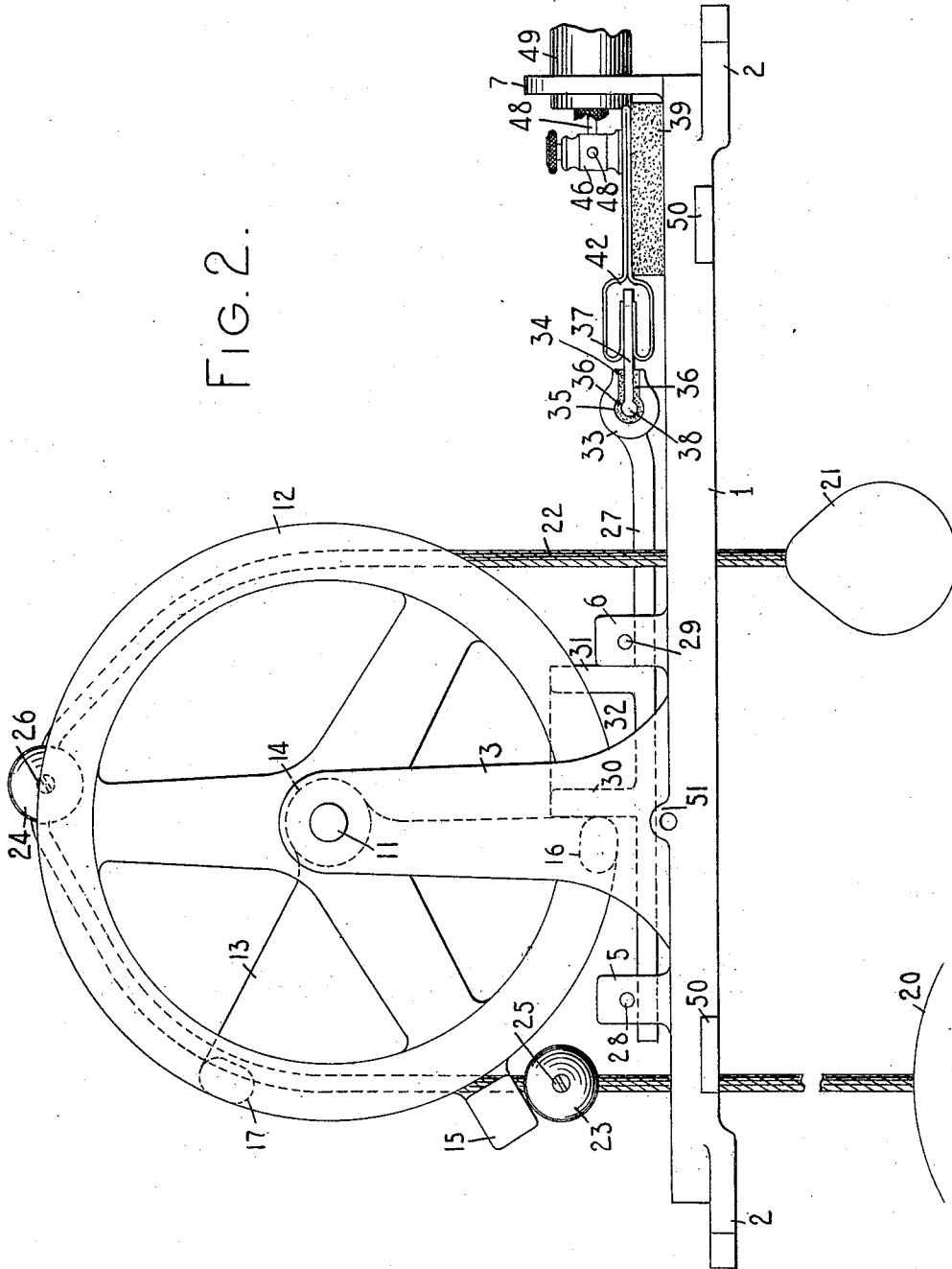
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4 SHEETS-SHEET 2.



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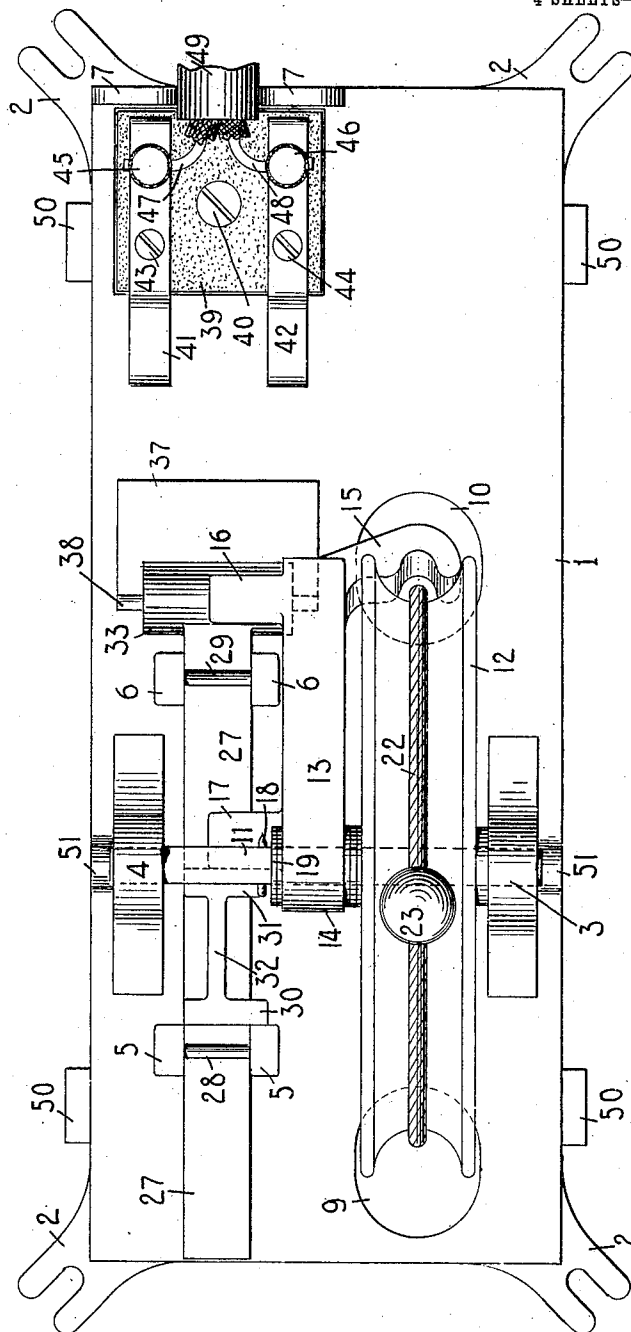
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4 SHEETS—SHEET 3.

FIG. 3.



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4 SHEETS—SHEET 4.

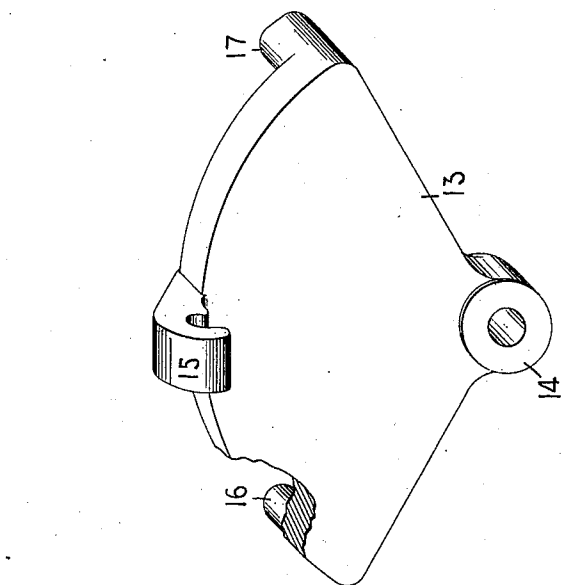


FIG. 5.

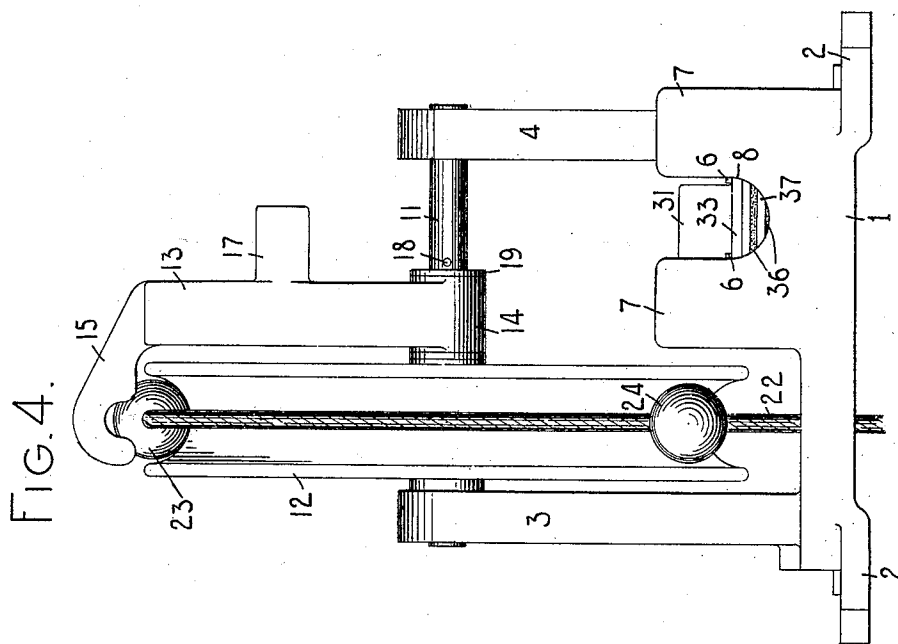


FIG. 4.

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UNITED STATES PATENT OFFICE.

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FRANCIS H. STILLMAN, OF BROOKLYN, NEW YORK.

ELECTRIC TANK-SWITCH.

989,414.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed October 14, 1908. Serial No 457,610.

To all whom it may concern:

Be it known that I, HARRY A. PRINDLE, a citizen of the United States, and resident of East Orange, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Electric Tank-Switches, of which the following is a full, clear, and exact description, reference being made to the accompanying drawings, forming part of this specification.

This invention relates to improvements in electric tank-switches whose operation may be made to depend on the rise and fall of water in a tank, and which may be used to close and break a circuit and thus start and stop an electric motor and a pump driven thereby, so that a proper quantity of water shall be pumped into the tank whenever the water therein is lowered to a certain level.

An object of the invention is to provide an electric tank-switch with a part or parts which may be adjusted so that the water-level at which the pump shall start to work may be either near the bottom or near the top of the tank, or at any height between those limits, and that the pump shall stop when the depth of the water has been increased to a predetermined extent by the addition of either a small quantity or some larger quantity of water to the contents of the tank; and other objects are to improve the construction and operation of the holder of the conducting blade that is movable to close and break the circuit, and the means whereby the blade is secured to the holder.

The invention consists of an electric switch comprising the features of construction and combinations which are described and claimed herein.

On the accompanying sheets of drawings, on which like reference-numerals designate like parts in different views, Figure 1 is a side elevation of a switch embodying the invention, the switch being shown on a tank nearly full of water, and as the switch appears when the circuit is broken; Fig. 2, a side elevation of the switch as it appears when the circuit is closed; Fig. 3, a plan of the switch, the parts being in the positions shown in Fig. 1; Fig. 4, an end-elevation, some of the parts being in positions differing from those shown in Figs. 1, 2 and 3; and Fig. 5, a perspective of the part hereinafter called "the driver".

The base 1 of the switch is an oblong cast-

ing having slotted feet 2 at the corners, and fast on the base, preferably forming parts of the same casting, are uprights 3 and 4, a pair of guide-blocks 5, another pair of guide-blocks 6, and a pipe-support 7 in which is a recess 8, the base having in it holes 9 and 10 (Fig. 3). The pairs of guide-blocks are equally distant from the vertical plane which bisects the uprights 3 and 4. These uprights support a fixed shaft 11, on which are mounted a grooved pulley 12 and a device which is called herein a driver, the pulley and driver being loose on the shaft. The driver is a metal block 13, provided with a hub 14 through which the shaft 11 passes, and having on it a projection 15 and lugs 16 and 17, the projection 15 extending outside of the pulley so that a small space is left between the projection and the grooved face of the pulley as appears by Fig. 4, and the lugs 16 and 17 being equally distant from the axis of the hub 14, and equally distant from the plane which contains that axis and cuts the projection 15 midway between its sides. The pulley and driver are prevented from moving on the shaft axially toward the upright 4 by a pin and washer 18 and 19.

A float 20 and a counterweight 21, secured together by a flexible tie 22 to whose ends they are attached, are connected with the pulley by means of the tie which passes from the float through the hole 9 in the base 1 and over the pulley and through the hole 10 to the counterweight. The flexible tie may be a cord, or small wire rope, or a chain, but for convenience it is shown as a cord. The float is heavier than the counterweight, and the length of the tie is preferably such that when the float is in the position shown in Fig. 1 the counterweight is near the bottom of the tank. On the tie is a pair of devices 23 and 24, which may be metal balls, and which are adjustable along the tie, and these devices are provided with fastenings, shown as set-screws 25 and 26, for holding the devices in different positions on the tie.

A bar 27, which forms part of a circuit-closing slide, extends between the guide-blocks 5 and between the guide-blocks 6, there being a flat surface, on which the bar rests and is movable endwise, between the guide-blocks of each pair. Pins 28 and 29 inserted in the guide-blocks 5 and 6 and ex-

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tending over the bar, keep it from being raised in the guide-blocks above the positions in which it is shown. On this bar is an upright block which is fast on the bar and which is shown as composed of ends 30 and 31 united with a web 32 (Fig. 3). The length of this block is equal to one half of the distance between the pair of guide-blocks 5 and 6, and its ends are wider than the bar 27 so that the movement of the block and bar in one direction is limited by one of the guide-blocks 5 and their movement in the other direction is limited by one of the guide-blocks 6. When the slide is in the position in which it appears in Figs. 1 and 3, the end 30 of this block is in the path of the lug 16 of the driver, and when the position of the slide is that shown in Fig. 2 the end 31 of this block is in the path of the lug 17 of the driver. On the bar 27 is a head 33 containing an open slot 34, 35, the inner part 35 of the slot being wider than the mouth 34. The walls of this slot are lined with insulating material 36, and a metal blade 37 having on it a bead 38 extends into the slot and through it from end to end, between layers of the insulating material, the bead 38 lying in the wider part 35 of the slot, and the blade and insulating material being tight in the head 33. The slot in the head 33 is first made as wide as is the part 35, from that part to the mouth of the slot. After the insulating material 36 and blade 37 have been inserted in the slot the head 33 is subjected to the action of a hammer and dies which changes the form of the slot to that shown and firmly secures the blade, insulating material, and head of the slide together, these devices then being tightly interlocked with one another.

Close to the pipe-support 7 is a block 39 of insulating material which is fastened to the base 1 by a screw 40, and on this block are spring contacts 41 and 42 which are fastened by screws 43 and 44 to the block and on which are binding-posts 45 and 46. Wires 47 and 48 of the circuit passing through the motor are attached to the binding-posts when the switch is to be put into use, and these wires are preferably incased in a pipe 49 resting in the recess 8 in the pipe-support.

On the lateral edges of the base are projections 50 intended to support a cover, which may be fastened to the base by screws driven into the lugs 51 formed on the base.

When the switch is in use it stands on the top 52 of a tank where it is fastened by screws or bolts passing through the slots in the feet 2. The tank is shown nearly full of water 53, and the parts of the switch are shown in Fig. 1 as they appear, if the devices 23 and 24 are adjusted as they are shown, just after the circuit has been broken and the water has reached its highest level

in the tank. As water is drawn from the tank the float 20 descends and the pulley turns, and the device 24 acting on the projection 15 of the driver turns the driver on the shaft 11 until the center of gravity of the driver passes over the axis of the shaft and then the driver is swung by gravity to the position where it is shown in Fig. 2, the lug 16 of the driver striking the end 30 of the block on the slide and forcing the slide forward until its position is that shown in Fig. 2, when the blade 27 extends into the contacts 41 and 42 and closes the circuit. Then the motor starts and water is pumped into the tank. The rising water carries the float upward, the pulley is turned by the action on it of the counterweight 21 and tie 22, the driver is turned by the device 23 acting on the projection 25, and when the center of gravity of the driver passes over the axis of the shaft 11, the level of the water then being as it is shown in Fig. 1, the driver is swung by gravity, and the slide is moved by the action of the lug 17 on the end 31 of the block on the slide, to the positions where they are shown in Fig. 1. By this action of the switch the blade 27 is withdrawn from the contacts 41 and 42, and as the circuit is then broken the pump stops supplying water to the tank.

If the devices 23 and 24 are adjusted on the tie 22 as they are shown obviously water will be pumped into the tank whenever the level of the water descends but a few inches from the top, and the tank will be kept nearly full unless water should be drawn from it faster than the pump can supply it with water. It will be understood that if the devices 23 and 24 are fastened on the tie 22 farther from the float than where they are shown and at the proper distance apart, and if the capacity of the pump is great enough, the depth of the water may be kept within a few inches of any predetermined depth less than that indicated in Fig. 1 and great enough to render the float operative by the water as described. It will also be understood that the devices 23 and 24 may be adjusted on the tie at different distances apart so that a larger or smaller quantity of water may be drawn from the tank during any period while the circuit is broken, and that a larger or smaller quantity shall be pumped into the tank during any period while the circuit is closed.

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

1. In an electric switch the combination of a movable circuit-closing device, a pivoted driver, and a pulley mounted side by side on a common support, the driver being operative to move said device to and from its working position, a float and counterweight and flexible tie secured together, the tie ex-

tending over the pulley, and means adapted to act on and impart motion in opposite directions to the driver, said means comprising a device mounted on and adjustable along the tie and a fastening for holding said device in different positions on the tie.

2. In an electric switch the combination of a movable circuit-closing device, a pivoted driver, and a pulley mounted side by side on a common support, the driver being operative to move said device to and from its working position, a float and counterweight and flexible tie secured together, the tie extending over the pulley, and means adapted to act on and impart motion in opposite directions to the driver, said means being composed of a pair of devices mounted on and adjustable along the tie and fastenings for holding said pair of devices in different positions on the tie.

3. In an electric switch the combination of a movable circuit-closing device, a pivoted driver operative to move said device to and from its working position, said driver having on it a projection, a pulley, a float and counterweight and flexible tie secured together, the tie extending over the pulley, and a pair of devices attached to the tie and adapted to act on opposite sides of said projection.

4. In an electric switch the combination of a movable circuit-closing device, a pivoted driver operative to move said device to and from its working position, said driver having on it a projection, a pulley, a float and counterweight and flexible tie secured together, the tie extending over the pulley, and a pair of devices attached to the tie and adapted to act on opposite sides of said projection, said pair of devices being adjustable on the tie.

5. In an electric switch the combination of a movable circuit-closing device, a pivoted driver operative to move said device to and from its working position, said driver having on it a projection, a pulley, a float and

counterweight and flexible tie secured together, the tie extending over the pulley, and means on the tie adapted to act on said projection.

6. In an electric switch comprising a base, the combination of a horizontal circuit-closing slide movable on a guide formed on the base, a pivoted driver and a pulley mounted on a support attached to the base, the pivot of the driver and axis of the pulley being above the slide, and the driver being operative to move said slide to and from its working position, a float and counterweight and flexible tie secured together, the tie extending over the pulley, and means adapted to act on the driver and impart motion to it in opposite directions.

7. In an electric switch the combination of a horizontal circuit-closing slide, a driver mounted on an axis above the slide, the driver being operative to move said slide to and from its working position, a pulley mounted on said axis, a float and counterweight and flexible tie secured together, the tie extending over the pulley, and a pair of devices attached to the tie and adapted to act on the driver and impart motion to it in opposite directions.

8. In an electric switch a circuit-closing device comprising a metal blade, a holder for the blade, and insulating material interposed between the blade and holder, the holder containing an open slot which includes a part that is wider than the mouth of the slot, and the insulating material being within said slot, and the blade extending into the slot between layers of the insulating material and having on it a bead which lies in the wider part of the slot, the insulating material and blade filling the slot and being tight therein.

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In presence of—

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