

No. 843,276.

PATENTED FEB. 5, 1907.

W. F. IRISH.
AUTOMATIC ELECTRIC SWITCH.
APPLICATION FILED JULY 16, 1904.

Fig. 2

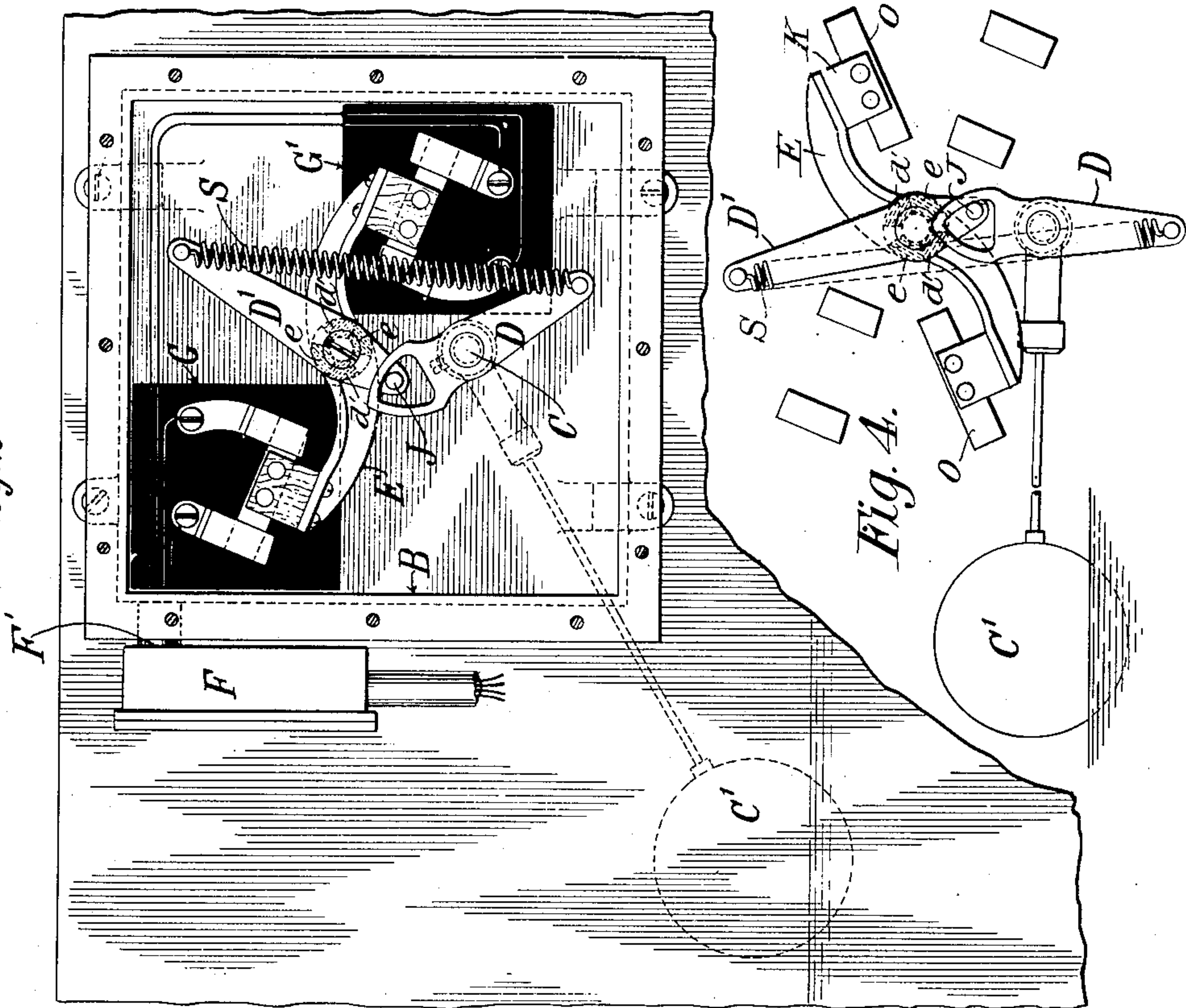


Fig. 1

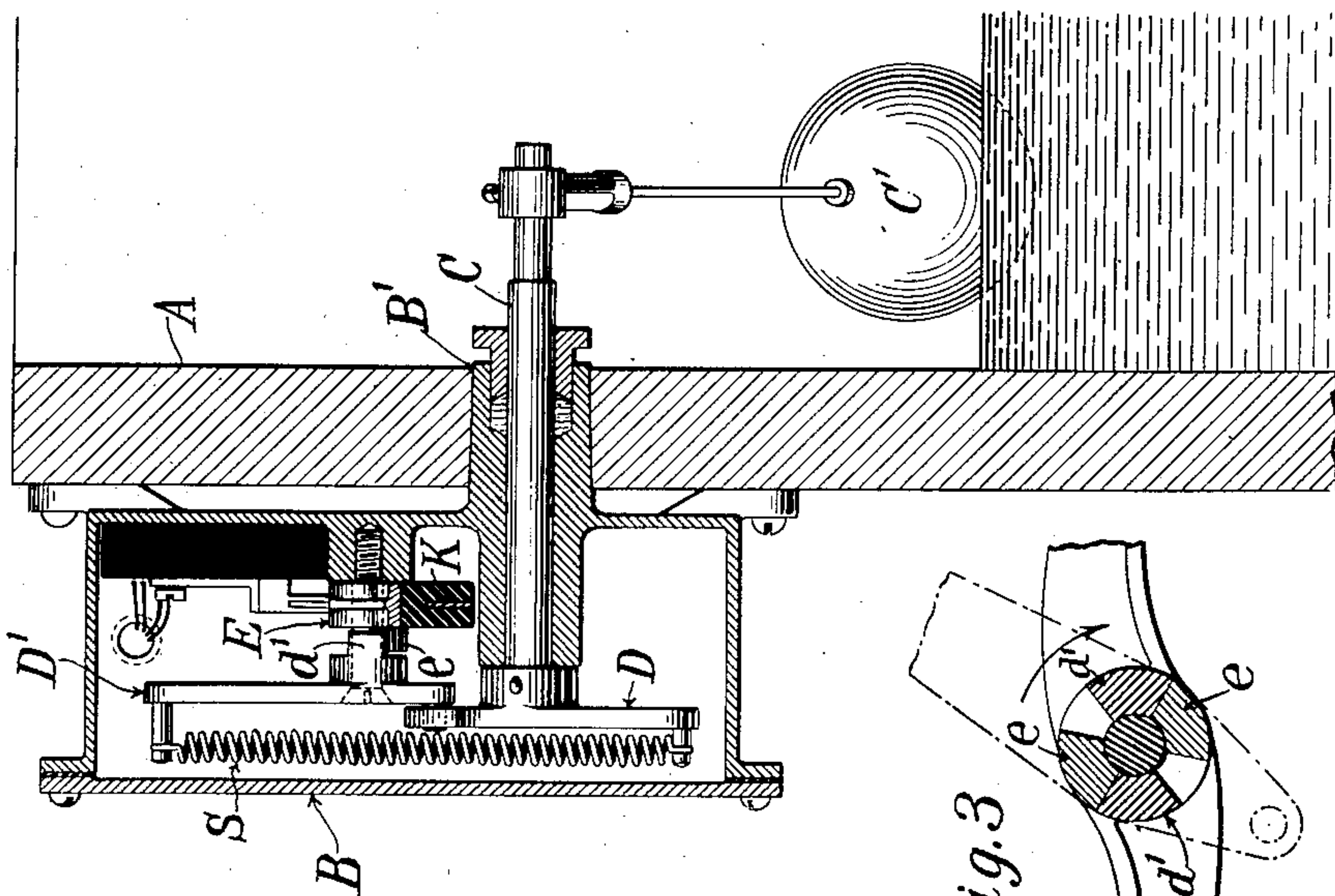
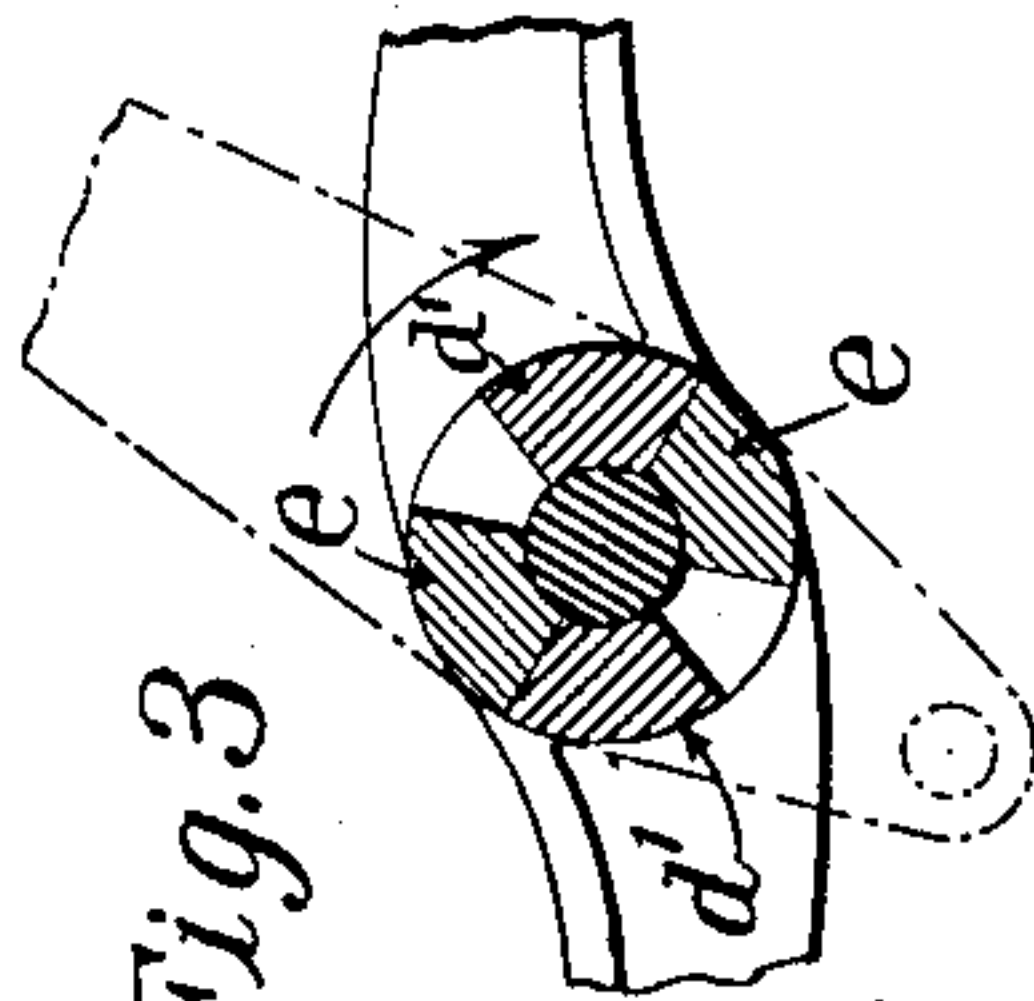


Fig. 3



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM F. IRISH, OF EAST ORANGE, NEW JERSEY.

AUTOMATIC ELECTRIC SWITCH.

No. 843,276.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed July 16, 1904. Serial No. 216,791.

To all whom it may concern:

Be it known that I, WILLIAM F. IRISH, a citizen of the United States, residing at East Orange, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Automatic Electric Switches, of which the following specification and accompanying drawings illustrate one form of the invention which I now regard as the best out of the various forms in which the invention may be embodied.

In the drawings, Figure 1 is a vertical center section of my apparatus. Fig. 2 is a plan thereof with the cover of the switch-box removed. Figs. 3 and 4 are details.

My switch is especially designed for use in situations where an electric circuit or circuits is to be opened or closed at a predetermined time, dependent upon the conditions of some operative device, such as a float in a water-tank.

I have illustrated the invention by an arrangement which embodies its application to a water-tank and make herein special claims to this particular feature.

Turning to the drawings, A is a wall of a tank, and B is a closed box containing the switch, this box being provided on its rear side with a projecting sleeve B', which enters an opening through the wall of the tank and contains a shaft C, passing axially there-through and provided with a stuffing-box inside the tank.

C' is a float mounted on an arm projecting from the shaft C and operating to turn the shaft as it rises or falls with the level of the water. On the outer end of the shaft C is secured an operating-lever D, while in proximity to this lever is mounted a second intermediate lever D'. The adjacent ends of these two levers are interengaged by means of a pin J upon lever D', which enters a triangular opening in the adjacent end of the lever D. The remaining outer end of the two levers D and D' are joined by a strong spring S. These two levers and the spring constitute the actuating device of a switch-lever E, pivotally mounted in a short stud projecting inwardly from the rear wall of the box B, on which stud the lever D' is also mounted. The engagement of the switch-lever E with the actuating agency is by means of two lugs d', projecting inwardly from the hub of the lever D' and alternated in position with two similar lugs e on the hub of the switch-lever. These lugs are of such width as to permit

considerable lost motion between the two sets, as is particularly shown in the detailed drawing of Fig. 3. By this means the turning of the lever D' and the lugs d', affixed thereto, will first cause the operation of the lever E by the engagement of the said lugs with the corresponding lugs e, and after such operation the lever E will continue to move by its momentum a short distance until its lugs e engage with the opposite sides of the lugs d'.

In Fig. 2 the parts are shown in a condition wherein the switch-lever is approaching its final closed-circuit position with the knife-blades O, mounted in insulating-blocks K on opposite ends of the switch-arm, engaging the corresponding switch-terminals mounted upon the insulating-blocks G and G'. In this condition the spring S is tending to draw together the ends of the levers D D', the former lever acting as an abutment to the spring, and the latter lever, operated by the spring, is engaging the switch-lever E and pushing the blades O home against their contacts. The final position of the pin J will be one of rest at or near the tip of the triangular opening in the lever D. The lever D is at this moment in a position determined by the float C', which is at its lowest level and therefore acting to close the circuit of the pump-motor by which the tank is supplied.

Assuming next that the level of the water in the tank rises to the desired height, it is manifest that the float C', rising with the water, will turn the lever D and move the lever D' by the engagement of the pin J therewith to the left-hand side of the triangular opening in the end of the lever. This will finally bring the lug d' against the lug e on the switch-lever at about the time when the spring S is on dead-center nearly in line with the axes of the levers D and D'. A slight additional movement will throw the spring over the dead-center, where it will tend to draw together the remote ends of the two levers, actuating at the same time the switch-lever E to suddenly and positively withdraw the switch-blades from the terminal contacts and open the circuit. The lost motion between the switch-lever and the intermediate lever D' will permit an additional throw of the lever E, so as to produce a wide gap between the switch-contacts, as appears in Fig. 4, wherein the parts are shown in the condition they are in just after the spring has passed the dead-center and thrown the switch-lever.

The arrangement herein shown is specially convenient and suitable for use with water-tanks, since the inclosure of the switch by the box B on the outside of the tank protects it completely against moisture, and particularly against the splashing of the water in the tank. On the outside of the switch-box B is mounted a junction-box F, which communicates, through a tube F', with the interior of the switch-box, and through this tube are passed the wires which lead from the switch-terminals to the external circuit. The float-arm is removable from the shaft C, so that in mounting the apparatus it is only necessary to bore a hole through the wall of the tank, through which the sleeve B' may be passed from the outside. This serves to mount the switch-box on the outside of the tank, where it may be further secured by screws. It only remains to attach the arm of the float to the shaft C' and make the usual electrical connections through the junction-box F.

What I claim as new, and desire to secure by Letters Patent, is—

1. An automatic switch comprising two levers mounted upon adjacent centers and having a loose engagement with each other, a spring joining the remote ends of the levers, switch-contacts controlled by one of the said levers and operating devices connected to the other lever.

2. The combination with a switch-lever E, of an operating-lever D, an intermediate lever D', a spring S connecting the remote ends of levers D and D' and operating the levers over a dead-center, and a float or other operating device connected to the lever D.

3. In an automatic switch, the combination with an operating-lever and an intermediate lever having their adjacent ends in engagement by means of a pin in one lever engaging a triangular opening in the other, of a spring connecting the two ends of the said levers, a switch-arm having a lost-motion

connection with the said intermediate lever and a float or other operating device connected to the operating-lever.

4. In an automatic switch, the combination with the levers D and D' having their adjacent ends engaging by means of a pin in one lever engaging a triangular end in the other lever, of a spring S connecting the remote ends of the said levers and operating the lever D' upon either side of a dead-center, lugs *d* on the hub of the lever D', a switch-lever E having on its hub similar lugs *e* engaging with lugs *e'*, electrical contacts controlled by the said switch-lever and a float or other operating means connected with the lever D.

5. An automatic connection-switch provided with an inclosing case having a projecting sleeve adapted to traverse the wall of the tank, an operating-shaft passing through the said sleeve and provided on one end with means for attaching a float thereto, electrical switch-contacts, an actuating-spring for said contacts, and a connection between the said spring and the said operating-shaft for throwing the spring to one side or the other of a dead-center.

6. An automatic connection-switch provided with an inclosing box B having on its rear side a projecting sleeve B', an operating-shaft C passing through the said sleeve and adapted to receive a float at its inner end, a lever mounted on the opposite end of the said shaft, an actuating-spring C for the switch-contacts attached to said lever, together with the said contacts and electrical connections therefrom.

In witness whereof I have hereunto set my hand, before two subscribing witnesses, this 15th day of July, 1904.

WILLIAM F. IRISH.

Witnesses:

G. W. HOPKINS,
L. T. SHAW.