

(No Model.)

L. A. FEHR.
ELECTRIC SUBWAY SWITCH.

No. 463,808.

Patented Nov. 24, 1891.

Fig. 1.

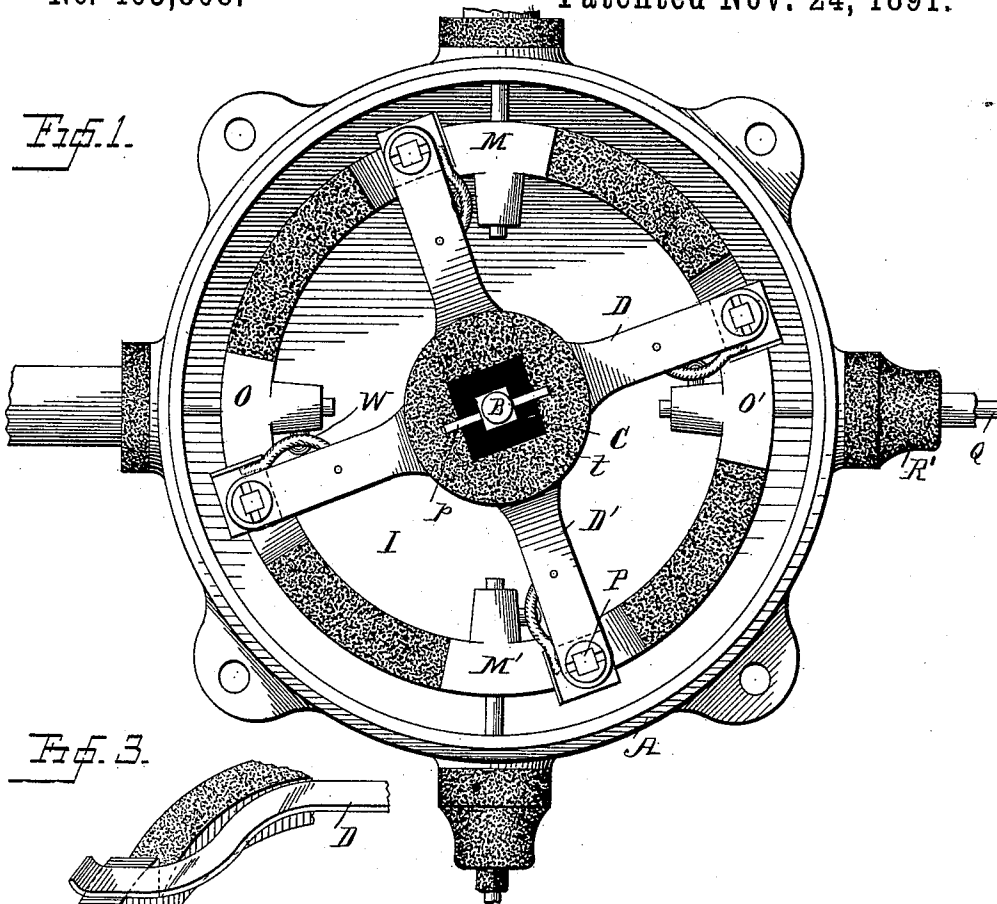


Fig. 3.

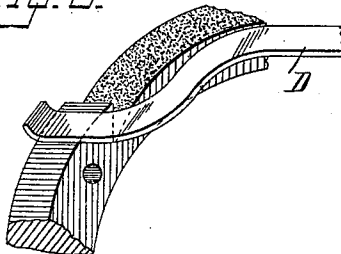
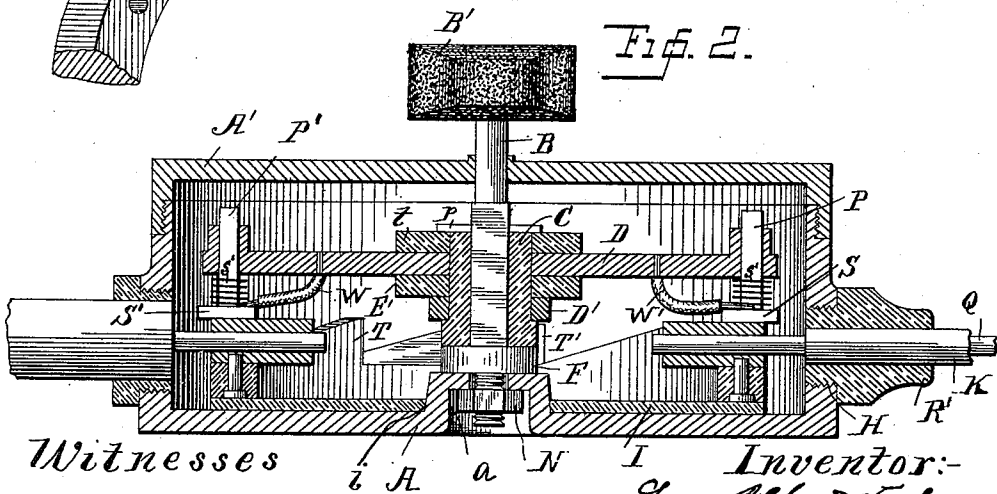


Fig. 2.



Witnesses

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Inventor:-

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UNITED STATES PATENT OFFICE.

LOUIS ALBERT FEHR, OF NEW YORK, N. Y.

ELECTRIC SUBWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 463,808, dated November 24, 1891.

Application filed November 28, 1890. Serial No. 372,958. (No model.)

To all whom it may concern:

Be it known that I, LOUIS ALBERT FEHR, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Electrical Subway-Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists of the improved electrical switch and casing for the same, to be used principally in subways, hereinafter to be more fully described and claimed.

In the drawings, Figure 1 is a plan view of my improved switch with the top of the casing removed. Fig 2 is a vertical central section of the same with the top or cover on. Fig. 3 is a modification.

Many difficulties have been encountered with switches heretofore used in electrical subways. If the cases are made of insulating material, they are liable either to breakage or decay. If made of iron, there has been a liability to destruction of the insulation, and consequent grounding of the current or the giving of dangerous shocks to workmen. It has been difficult to tell without opening the case whether the switch was completely turned or not, and difficult to remove parts for cleaning or repairing without taking out the whole case.

To avoid the above disadvantages and others unnecessary to enumerate, I have designed the form of switch and casing herein to be described, in which—

A is the main portion of the casing, which may be of iron or of any proper material. A' is the top or cap, which screws on the same. In the bottom of the casing is a disk of any material, preferably a non-conducting material, which supports a ring J, which must be of some insulating substance, and which is cut out into the form of ratchet-teeth T T' on its upper surface. The disk I serves to keep the ring J centered about the shaft B, on which revolve the arms D D' of a switch of two, four, or more poles. The ring J has twice as many ratchet-teeth as there are poles to the switch, and every other one of said teeth is provided with a facing of some conducting

material, as copper. (Shown at O M O' M' in Fig. 1.) These pieces or facings of metal are connected to wires or cables Q by binding-screws (shown in Fig. 1) or in any convenient manner. The armor K of these wires or cables may completely fill the openings H in the casing provided for them, or there may be bushings R' provided to insure moisture-tight joints. The arms D D' carry plungers P P', which terminate in contact-pieces S S, which are forced down upon the ratchet-teeth T by springs S' S'. To insure a good electrical connection, the wires W W' connect said contact-pieces with the arms D D', which are themselves formed of conducting material. Said arms D D' are insulated from one another and from the shaft B by the insulating-pieces t E' and the hollow prismatic core C. At the same time they are held in place by the pin p, and are compelled to turn with the shaft B by virtue of the square cross-section of the same at the point where it passes through this portion of the apparatus.

The nut N holds the shaft B in position, and the handle B' is screwed to the top of the shaft, so that it will turn it in the direction of the hands of a watch, but will simply unscrew when turned the other way. The collar F serves as a bearing for the shaft on the raised portion a of the bottom of the casing. This raised portion and the opening i in the disk I, which fits over it, are larger than the collar F, so that the entire switch apparatus and connections can be taken out without disturbing the casing and shaft by unscrewing the handle B' and cover A', withdrawing the pin p and the binding-screws which fasten the wires Q to the plates O M, &c.

The mode of operation of my invention is simple. The plates O O' M M' being furnished with outside connections, as shown, the turning of the handle B' makes or breaks the circuit from O through one switch-bar to O', and from M to M'. As the spring-pressed contact-pieces slip over the edge of the ratchet-teeth they come down with a snap that can be heard and felt by the operator, so that he knows when the switch has been turned. Of course when the contact-pieces rest on the teeth of insulating material the circuits are broken.

Another advantage of my construction is

that it cannot work loose, so that the switch shall turn itself.

It is evident that various changes in construction might be made without departing from the spirit of my invention, so long as the opposite contact-plates, as S and S, are connected one to another and are spring-pressed down upon ratchet-teeth which are alternately conducting and non-conducting, said ratchet-teeth being arranged under the line of travel of said contact-pieces, and the conducting ones thereof being furnished with outside connections.

Fig. 3 illustrates a modification in which the bar D is rendered itself elastic and the other springs done away with.

Having therefore described my invention, what I claim as new, and desire to protect by Letters Patent, is—

The combination of the casing, the revol-

ing shaft which passes up through the center thereof, the removable ratchet-toothed ring of insulating material concentric with said shaft and having certain of its teeth faced with conducting material and connected with external circuits, the spring switch-bars loosely mounted on but revolving with said shaft, the hollow prismatic core, and the two or more washers of insulating material by which said bars are insulated from each other and from the shaft, the removable pin for holding them on the shaft, and the handle screwed upon the end of said shaft so as to revolve it in one direction, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

LOUIS ALBERT FEHR.

Witnesses:

WARREN W. FOSTER,

HERBERT L. LUQUES.