

L. L. TATUM.
ELECTRIC SWITCH CONTACT.
APPLICATION FILED AUG. 27, 1907.

1,040,455.

Patented Oct. 8, 1912.

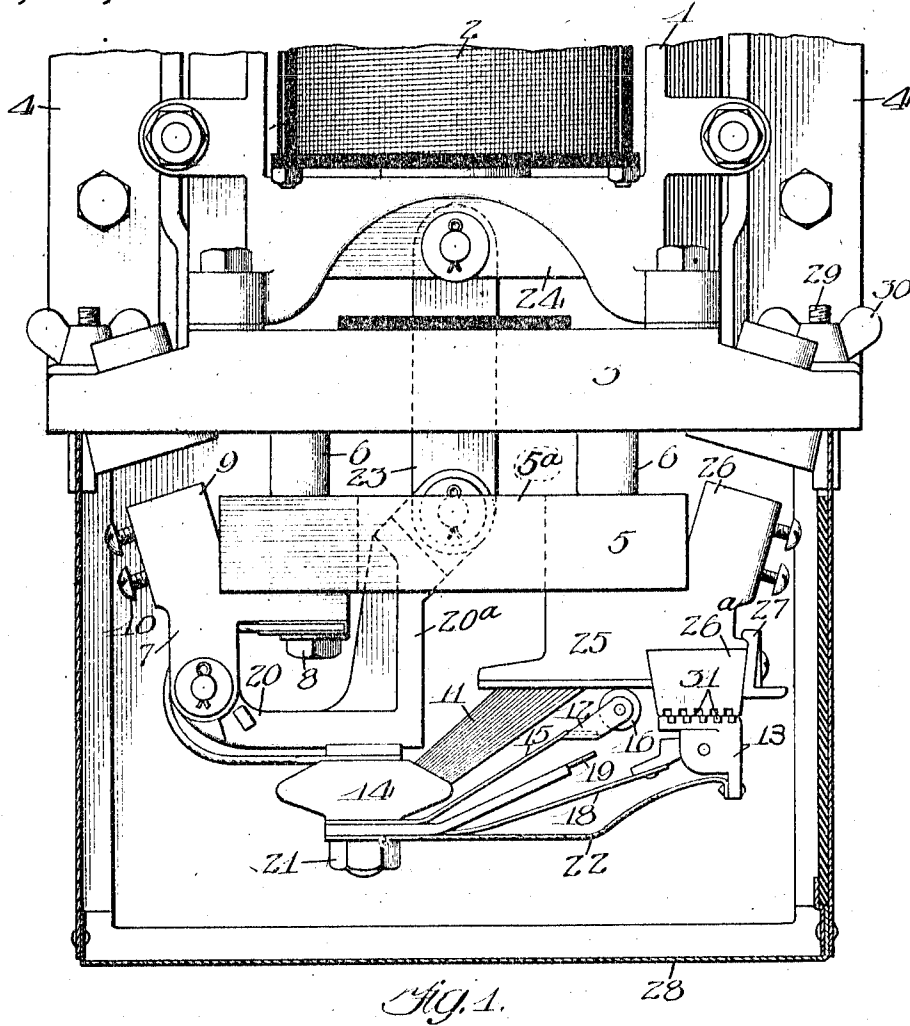


Fig. 2.

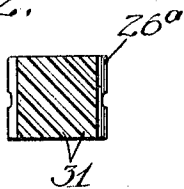
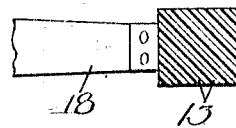


Fig. 3.



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UNITED STATES PATENT OFFICE.

LEWIS L. TATUM, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO THE CUTLER-HAMMER MFG. CO., OF MILWAUKEE, WISCONSIN, A CORPORATION OF WISCONSIN.

ELECTRIC-SWITCH CONTACT.

1,040,455.

Specification of Letters Patent.

Patented Oct. 8, 1912.

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To all whom it may concern:

Be it known that I, LEWIS L. TATUM, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Electric-Switch Contacts, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to improvements in electric switches and particularly to contacts for such switches. It applies particularly to switches in which the contacts are immersed in oil.

Heretofore the faces of the switch have been smooth and when the contacts were brought into engagement, a thin film of oil remained between the same, thereby causing a high resistance contact. Due to this fact arcs formed which burned the contacts and caused them to deteriorate.

One of the objects of my invention is to form the contacts of a switch in such a manner that when the contacts are moved into engagement the oil film will be practically eliminated.

In accordance with the preferred form of my invention, I provide recesses in the contact face of at least one of the contacts. Due to this construction when the contacts are brought into engagement the oil which may be between the contacting faces is squeezed or rubbed from between the faces and into the recesses, thereby eliminating the oil film, which has previously existed between the contacts.

When the contact faces are made smooth as has been previously done, owing to the fact that the area of the contact faces is so great, the oil film which occurs between the contact faces could not be squeezed or rubbed out. By my construction, due to the recesses formed in the contact faces, the oil film which tends to form between the contact portions or contact faces of the contacts may be readily squeezed or rubbed into the recesses. Accordingly a close engagement is secured between the contact faces, whereby the current will be carried better than in the old form of contact, and arcs will be eliminated during the engagement of the contacts.

For the purpose of disclosing my invention, I have illustrated in the accompanying drawing, one embodiment thereof.

In said drawing: Figure 1 is an elevation of an electro-magnetic switch having the arcing contacts thereof constructed in accordance with my invention, the oil casing of said switch being shown in section. Fig. 2 is an underside view of the stationary arcing contact, and Fig. 3 is a plan view of the moving arcing contact.

Although I have illustrated in the accompanying drawing for the purpose of disclosing my invention, one use of the same, it will be understood that the invention may be applied in various other capacities.

In the electro-magnetic switch illustrated, I preferably provide an alternating current magnet having a frame 1, in which is supported the usual electro-magnetic winding 2. This frame is supported upon a cover or head 3 having upwardly extending lugs 4, by which it is adapted to be attached to any suitable base.

The switch parts are all mounted beneath the cover or head 3, upon an insulating block 5 which depends from the cover or head 3, and is secured thereto by suitable bolts 6. The movable member of the switch is mounted upon a stationary terminal member 7 secured to the insulating block 5 by a bolt 8, and having a suitable terminal socket 9 provided with screws 10, into which is adapted to fit the end of one of the conductors. The movable member of the switch comprises a main contact or brush 11, an auxiliary contact 12 and an arcing contact 13. The main contact is slightly flexible so that, when it engages the stationary contact member of the switch, it will rub over the contact plate, and is preferably made of laminations or leaves fastened in a cup 14. The auxiliary contact is preferably mounted upon a flexible or spring arm 15, and takes the form of a roller 16 adapted to make a rolling engagement with the contact plate. The arcing contact 13 is preferably pivoted upon a spring arm 18 which, when the switch is open rests against a stop or plate 19, which prevents the arcing contact from coming into engagement with the auxiliary contact. The main contact 11, the arm 15, the plate 19, and the arm 18 are preferably carried upon an arm 20, pivoted upon the support 7, and are clamped in position upon said pivoted arm by means of a nut 21. In order that the arm 18 may be relieved of carrying current which would tend to deteriorate the

spring thereof, I provide a flexible conductor 22, which extends between the cup 14 and the arcing contact 13, and which is adapted to carry the current. The pivoted arm 20 is provided with an upwardly extending member 20^a, adapted to pass through a central opening 5^a cut in the block 5, and be pivotally connected to a link 23, which at its opposite end is pivotally connected with the core 24 of the solenoid 2. Thus when the solenoid winding is energized, the arm 20 will be raised and will carry with it the various movable contacts of the switch. The stationary contact of the switch comprises a stationary contact plate 25, having a terminal socket 26 similar to the terminal socket 9, and provided with a removable arcing contact plate 26^a. This arcing contact plate is preferably secured in position by means of a clamp 27, and is adapted to be engaged by the arcing contact 13.

The various contacts are all inclosed in an oil casing 28, which is secured to the casing head 3 by suitable screws 29 which are connected to the casing and extend through the head, nuts 30 being provided on the screws to maintain the casing in position. The casing is filled with oil whereby all of the contacts operate in an oil bath.

It has been found that, where switch contacts which operate in oil have the faces thereof comparatively smooth, an oil film forms between the faces, thereby causing a high resistance contact and tending to form arcs which burn and cause the deterioration of the contacts. I have therefore provided the arcing contact 13 and the arcing contact plate 26^a with recesses or slots 31, which extend diagonally across the faces of the members, whereby as the two members engage, the film of oil may be readily pressed into these recesses, permitting a clean contact to be made. In practice, I prefer to have the grooves in one contact so disposed that they will intersect the grooves in the other contact, and have so illustrated the same.

While I have described the recesses as being formed in the arcing contacts it will be understood that like recesses may be

formed in two contact members wherever desired, irrespective of whether they form arcing or main contacts.

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

1. A pair of cooperating switch contacts each having a rigid contact face with a plurality of grooves therein, the grooves in one contact extending angularly to the grooves in the other contact.

2. A pair of cooperating switch contacts each provided with a rigid contact face having a plurality of diagonally disposed grooves, the grooves in one contact being disposed to intersect the grooves in the other contact.

3. In an oil immersed switch, cooperating switch contacts, the engaging face of one of said contacts comprising a plurality of substantially parallel rigid ribs spaced to form open ended channels for conveying the oil away from the engaging faces of said contacts when brought together.

4. A pair of cooperating switch contacts the engaging surface of each contact comprising a plurality of rigid uninterrupted ribs spaced from one another throughout their entire length, the ribs of one contact extending at an angle to the ribs of the other contact.

5. In an oil immersed switch, cooperating contacts, one of said contacts having one or more grooves therein for conveying the oil away from the engaging faces of said contacts when the switch is operated.

6. In an oil immersed switch, cooperating contacts each provided with a rigid contact face having one or more grooves formed therein for conveying the oil away from the engaging faces of said contacts when the switch is operated.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

LEWIS L. TATUM.

Witnesses:

FRANK H. HUBBARD,
ALEX. H. LIDDERS.