Dec. 30, 1930. C. THUMIM 1,787,291

ELECTRIC SWITCH

Filed Nov. 22, 1928

Fig. 1.

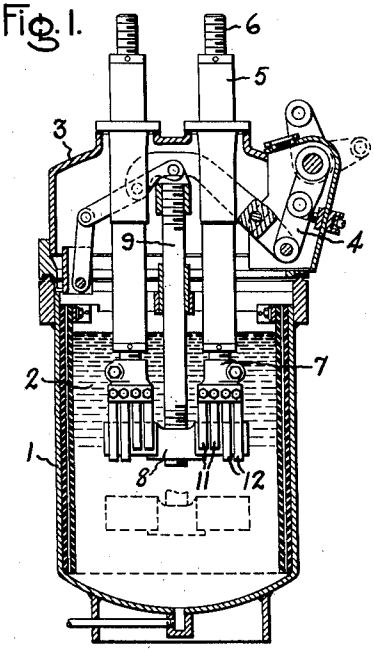


Fig. 2.

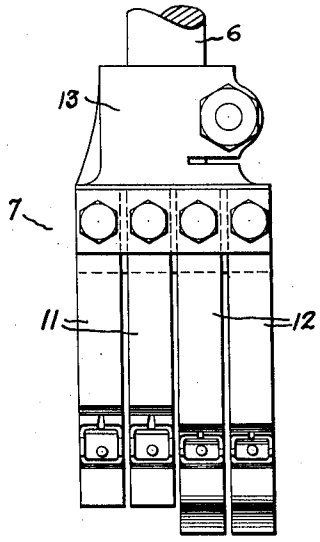


Fig. 3.

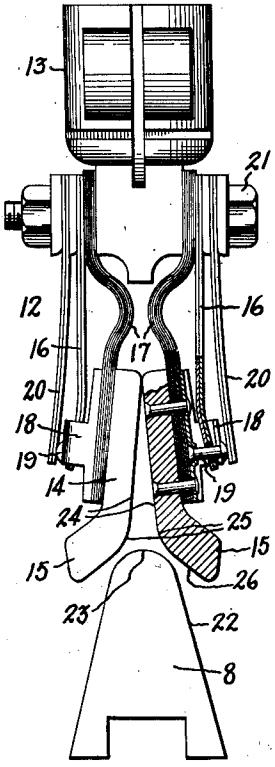


Fig. 4.

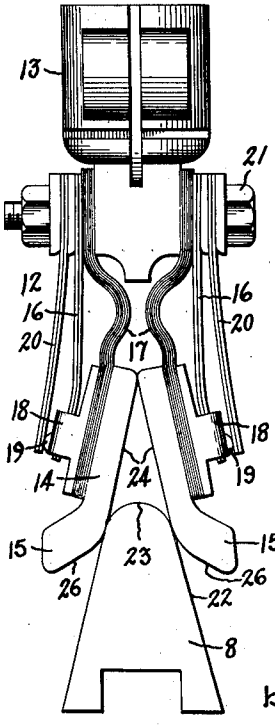
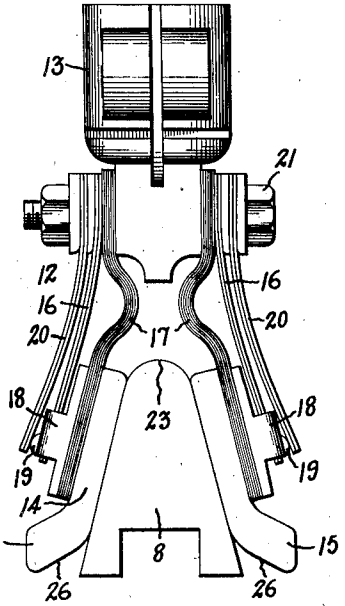


Fig. 5.



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Carl Thumim,
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His Attorney.

Patented Dec. 30, 1930

1,787,291

UNITED STATES PATENT OFFICE

CARL THUMIM, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK

ELECTRIC SWITCH

Application filed November 22, 1928. Serial No. 321,190.

My invention relates to electric switches and particularly to switches of the type in which one of the cooperating contacts is a wedge member and the other comprises yielding plates which engage the opposite faces of the wedge member. An object of my invention is the provision of an improved switch of this character whereby any arc that is drawn upon the opening of the switch does not burn the contact faces.

My invention will be better understood from the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

Referring to the drawing, Fig. 1 is a cross section of an electric switch of the liquid break type embodying my invention; Fig. 2 is an enlarged view showing one of the fixed contacts thereof; Figs. 3, 4 and 5 are views on a still larger scale showing the action of the contacts respectively in three successive positions.

The switch in which I have chosen to illustrate my invention comprises the tank 1 containing insulating liquid 2 and having the top 3 enclosing the operating mechanism 4. Through the top extend the insulator bushings 5 and studs 6 to the inner ends of which are secured the fixed contacts 7. Arranged to bridge the two fixed contacts 7 is the movable bridging contact wedge 8 connected with the operating mechanism by means of the operating rod 9. The fixed contacts each comprise a plurality of fingers which engage opposite faces of the movable wedge 8. In the present embodiment of my invention, I have shown two pairs of main contact fingers 11 and two pairs of auxiliary or arcing contact fingers 12. The construction of the main contacts 11 is disclosed and claimed in the copending application of George H. Tovey and myself, Serial No. 244,596, filed January 5, 1928, and assigned to the same assignee as the present application. The construction of the auxiliary or arcing contact fingers 12 comprising the invention in the present case is a modified form of that shown in the aforesaid application whereby it is better adapted to function to finally interrupt the circuit without burning of the contact faces. Referring to Fig. 3 which is an enlarged view of the contact fingers 12, the member 13 supporting the fingers is arranged to be threaded and clamped to the lower end of the stud 6. The two contact plates 14 each have a relatively heavy outwardly flaring end portion 15 and are suspended from the member 13 by the semi-rigid supports 16. Secured for example by rivets to the rear face of each plate 14 over the flexible current conductor 17 is the sheet metal member 18 which preferably is bent up to receive the end of the support 16 and to which is secured the post 19. This post passes through an opening in support 16, there being sufficient clearance provided to permit of a certain amount of freedom of movement of the contact plate on the support. Engaging the outer rounded end of the post 19 is the leaf spring 20 which together with the support 16 is secured to the member 13 by the bolt 21. The parts above described are so constructed that in the open circuit position of the switch, such being shown in Fig. 3, the two opposite contact plates 14 rest against each other at their rear portions so that they may pivot, or rock, with respect to each other and form with each other an angle which is materially less than the angle of the cooperating contact 8. As the latter contact rises in the switch closing operation it first engages the flaring portions or tips 15 of the contact fingers whereupon the plates 14 first rock about their rear portions being opposed by the springs 20. When the parts reach a position approximately like that shown in Fig. 4 the contact plates 14 begin to separate bodily until the fully closed position is reached such as shown by Fig. 5. During this latter movement the effect of the springs 20 has been reinforced by the resilence of the supports 16, the combined force of the springs and supports producing the required contact pressure. Upon opening the switch the parts move in the reverse manner. As a result, the points of actual contact between the wedge 8 and the plates 14 passes from the two flat side faces 22 in the case of the wedge to the rounded edge portion 23. In the case of the

contact plates 14, the points of contact pass from the flat contact faces 24 thereof over the rounded edges 25 to the faces 26 of the heavy flared portions 15. Thus upon the opening of the switch there is no arc drawn between the contacts at those faces thereof which are depended upon for current transmission in the closed position. All burning of those faces therefore is avoided. It will be obvious that upon closing the switch any arc that strikes before actual contact takes place will also be between points of the cooperating contacts other than their flat contact faces, so that no burning of those faces will occur as the switch is closed.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. An electric switch comprising a wedge contact member, a cooperating contact member having contact plates arranged to engage opposite sides of the wedge contact member, and means for supporting said contact plates and yieldingly opposing outward movement thereof, said means being loosely connected with said contact plates to cause them to engage each other at their rear portions and rock about the point of engagement during the withdrawal movement of the wedge.

2. An electric switch comprising a wedge contact member, a cooperating contact member having contact plates arranged to engage opposite sides of the wedge contact member, and means for supporting said contact plates and yieldingly opposing outward movement thereof, said contact plates having outwardly flaring front portions and said means being loosely connected with contact plates and arranged to bias their rear portions towards each other when the wedge member is withdrawn whereby the final contact is made with said flaring portions.

3. An electric switch comprising a wedge contact member, a cooperating contact comprising plates having flat contact faces for engagement with the sides of the wedge member and having outwardly flaring arcing tips, means for yieldingly pressing said plates against the wedge member and for causing them to engage at their rear portions and rock toward each other when the wedge is withdrawn therefrom, the point of contact of the wedge with the plates being thereby moved to the flaring arcing tips.

4. An electric switch comprising a movable wedge contact member, a pair of cooperating contact plates having outwardly flaring tips, yieldable supports therefor, and springs for opposing outward movement of said plates, said springs being effective initially to move the plates bodily toward each other upon the withdrawal of the wedge contact and subsequently to cause the plates to engage at their rear portions and rock thereon whereby the points of final contact move to the flared portions.

In witness whereof, I have hereunto set my hand this 20th day of November, 1928.

CARL THUMIM.