

Feb. 18, 1930.

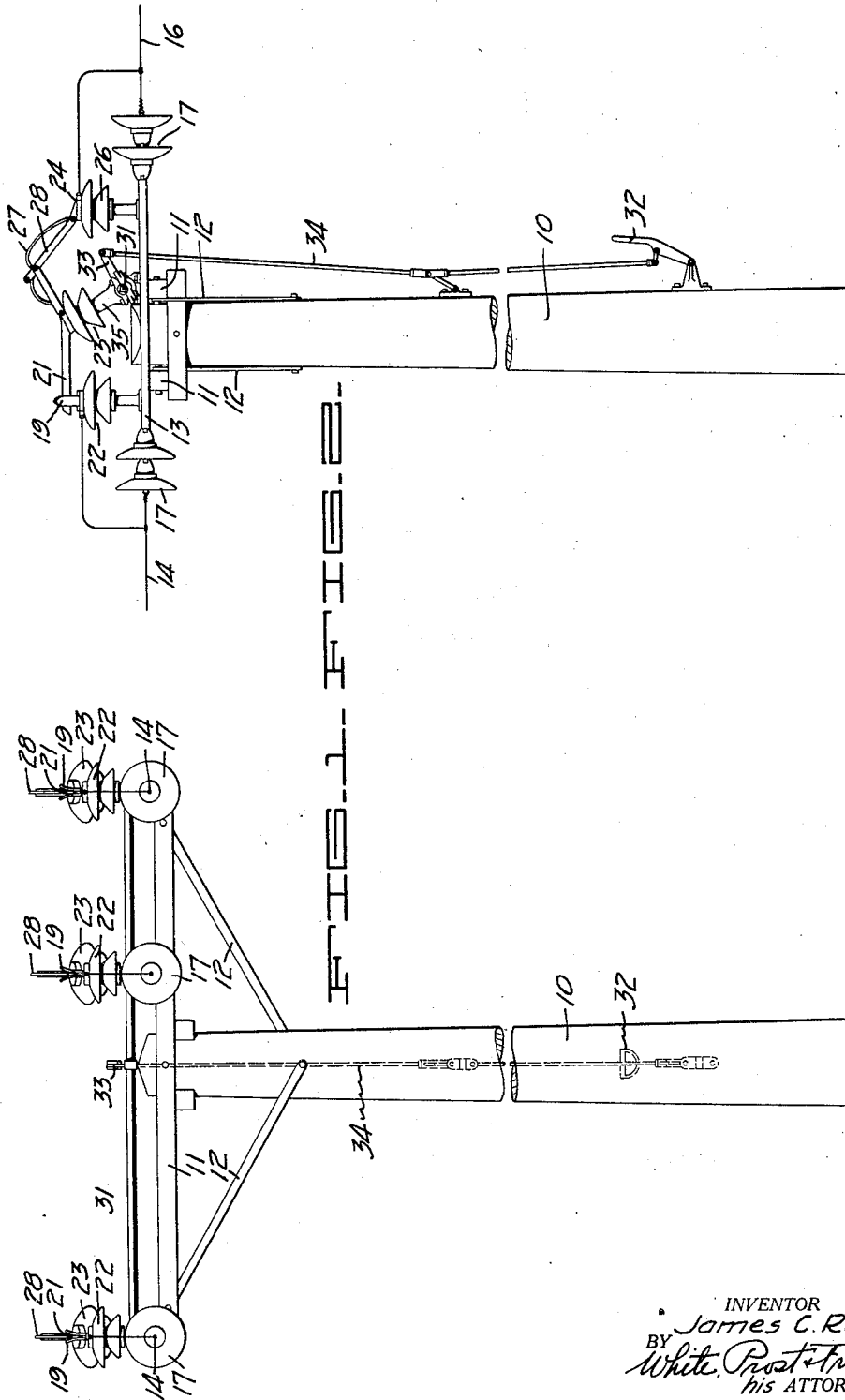
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1,747,320

ELECTRICAL SWITCH

Filed June 22, 1927

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

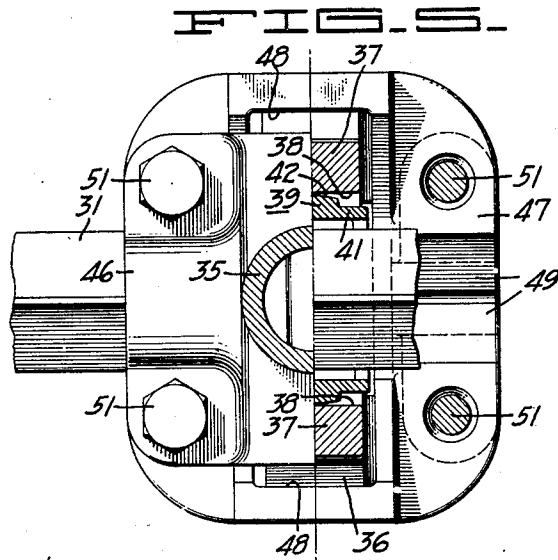
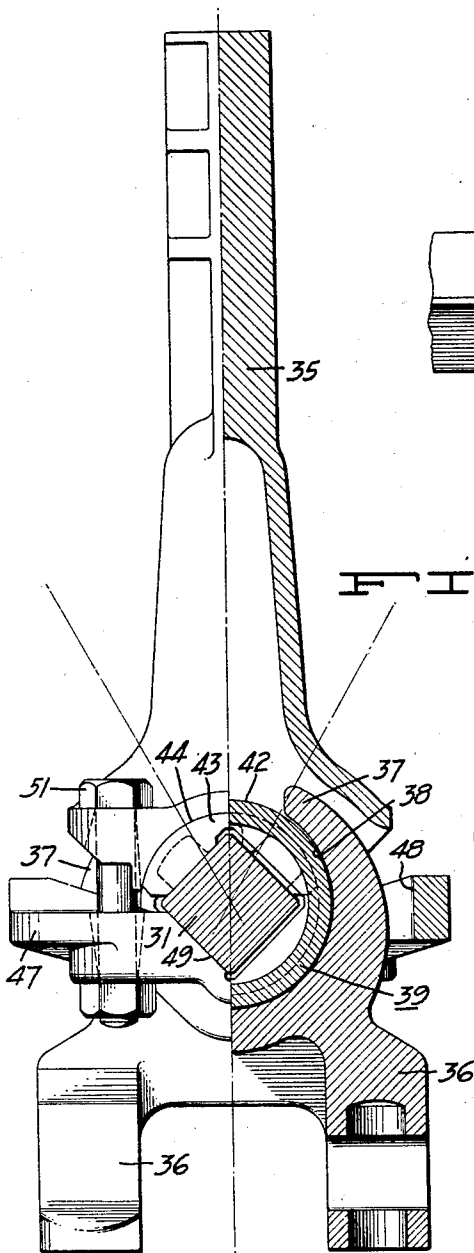


FIG. 3.

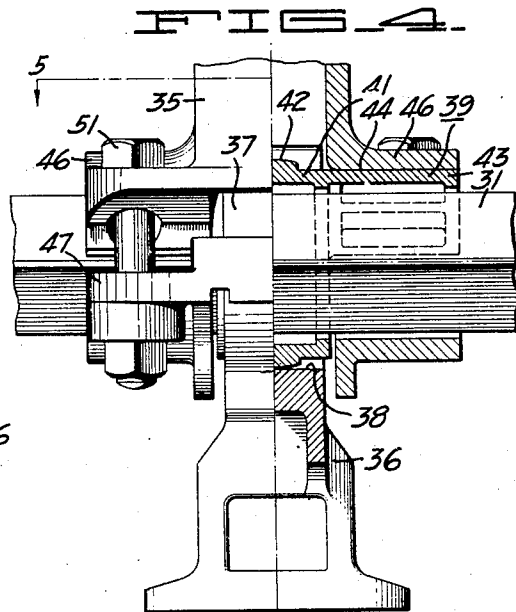


FIG. 4.

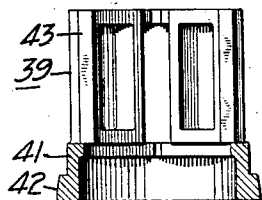


FIG. 6.

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ELECTRICAL SWITCH

Application filed June 22, 1927. Serial No. 200,535.

This invention relates generally to electrical switches and particularly to switches of the multipole type for making and breaking high tension electrical circuits.

5 It is an object of this invention to devise an electrical switch of the multipole type in which faulty electrical contact between the parts of the switch due to mechanical inaccuracies, may be prevented.

10 It is a further object of this invention to devise an electrical switch of the multipole type in which the switch blades are mounted so that they may be independently adjusted to insure uniform and efficient contact.

15 It is a further object of this invention to construct an electrical switch of the multipole type which may be readily assembled in elevated positions.

Referring to the drawing:

20 Fig. 1 is a side elevational view illustrating a complete electrical high tension switch incorporating the principles of this invention.

Fig. 2 is an end view of the switch shown in Fig. 1.

25 Fig. 3 is a side detail view partly in cross section and illustrating the adjustable mechanism for mounting the rocking insulators to the actuating shaft.

Fig. 4 is an end view of the mechanism shown in Fig. 1, one-half being shown in cross section.

Fig. 5 is a cross sectional view taken along the line 5—5 of Fig. 4.

Fig. 6 is a detail view illustrating the bushing incorporated in the mechanism of Figs. 3 to 5 inclusive.

The invention may be outlined briefly as comprising a plurality of movable switch blades which are adapted to cooperate with relatively stationary switch contacts. Each of the switch blades is carried by a separate insulator, and these insulators are adapted to be rocked simultaneously to open and close the separate lines. The rocking movement of the insulators is effected by means of a single rock shaft which carries arms upon which the insulators are mounted. As a special feature of this invention, these arms are so mounted that the switch blades may

be individually adjusted angularly with respect to the rock shaft.

Referring to the drawing for a specific description of the invention, I have shown in Figs. 1 and 2 a switch of the high tension type disposed on a suitable support such as a pole 10. In the assembly shown this pole is provided with suitable horizontal cross bars 11, which are reinforced by suitable bracing 12. Mounted in spaced relationship upon the cross bars 11, are the base strips 13 upon which the various parts of the switches are mounted. These strips 13 may also serve to carry the tension of the transmission lines 14 and 16, and for this purpose insulators 17 have been shown as secured to the ends of the same. The contacting parts of the switch may comprise for example a plurality of stationary contacts 19 in the form of metal jaws, and a plurality of switch blades 21 adapted to cooperate with the stationary contacts 19. The stationary contacts are each mounted upon a suitable insulator 22 which in turn is fixed to one of the strips 13, while the switch blades 21 are each mounted upon a suitable rocking insulator 23. Electrical connection to each of the blades 21 is made thru the connection terminals 24 which are each mounted upon a suitable insulator 26. Terminals 24 are connected to the blade 21 thru a flexible conductor 27 which may be supplemented by the linked conductor bars 28.

For rocking the insulators 23, I have provided a single rock shaft 31 which is preferably non-circular and which is actuated by suitable means such as a hand lever 32 located at some convenient point near the lower part of the pole 10. For example I have shown lever 32 as operatively connected to the crank shaft 31 by means of a crank lever 33 upon shaft 31, and a rod 34 connecting crank 33 and hand lever 32. Each of the insulators 23 is mounted upon a suitable insulator support pin or arm 35 which are each mounted to the crank shaft 31 by means shown in detail in Figs. 3 to 6 inclusive. At the point of attachment of each of the arms 35 with the shaft 31, the shaft is journaled in a suitable bracket 36 which is adapted to be mounted upon the intermediate portion of

the corresponding base strip 13. The bracket 36 is provided with a pair of upstanding curved arms 37 which are formed to provide an inner arcuate bearing surface 38. The shaft 31 is preferably square as shown and loosely disposed upon this shaft, there is a bushing 39 having a non-circular bore. This bushing is preferably constructed with an intermediate portion 41 which entirely surrounds the shaft 31, and which has a spherical bearing surface 42 adapted to be journaled upon the bearing surface 38 of bracket 36. The bushing 39 also has a pair of end portions 43 which extend only upon the upper side of shaft 31, and which have external cylindrical surfaces 44. Seated upon the end portions 43 of the bushing, are the lateral extensions 46 upon the lower end of arm 35, these extensions having inner curved surfaces bearing upon the curved surfaces 44 of end portions 43.

For clamping the arm and bushing in fixed relationship to the rock shaft 31, there is provided a suitable clamping plate 47 which is cut away as at 48 so that it may be positioned over the upstanding arms 37 of bracket 36 as shown. This clamping plate is provided with V-shaped notches 49 for fitting the shaft 31 and is adapted to be secured to the lateral extension 46 of arm 35 as by means of bolts 51. By tightening these bolts the entire assembly may be securely fixed to the rock shaft 31. The angular relationship of the arm 35 with respect to the rock shaft 31 may be adjusted as desired by loosening the bolts 51 upon one side of the shaft and tightening the bolts upon the other side, whereby the position of arm 35 upon bushing 39 is shifted.

In assembling the entire switch, the separate bases 13 are first positioned upon the cross bars 11 together with the bearing bracket 36. The clamping plates 47 are then dropped over the upstanding arms 37 of bracket 36, and after the bushings for the several bearings have been fixed upon the rock shaft 31, this shaft is properly positioned with the bushings disposed within their respective bearings. Because of the spherical surfaces 42 upon the bushings, it will be obvious that the respective journals for the rock shaft thus formed will be self-aligning, so that inaccuracies in aligning the bases 13 or in the bearing brackets 36 will cause no harm. The rocking insulators 23 together with the switch blades and the insulator support arms 35 are then positioned upon the respective bushings 39 and clamped thereto by means of the bolts 51. Before final tightening of bolts 51, arms 35 are adjusted longitudinally of the rock shaft 31 until the switch blades 21 accurately engage the contacts 19, and then the bolts 51 are adjusted so that when tightened, all of the switch blades enter the contacts 19 an equal depth when the switch is closed.

I claim:

1. In a multipole electrical switch, a rock shaft, a bearing adapted to be secured to a fixed support, a bushing disposed on said shaft and journaled in said bearing, a switch blade, and means for adjustably securing said blade to said bushing whereby said blade may be adjusted angularly with respect to said shaft.

2. In a multipole electrical switch, a rock shaft, a bearing adapted to be secured to a fixed support, a bushing disposed on said shaft and journaled in said bearing, said bushing having a curved outer surface, a switch blade and a member for securing said switch blade to said bushing, and means for adjustably clamping said member against said curved surface whereby the blade may be adjusted angularly with respect to the rock shaft.

3. In a multipole switch, a rock shaft, a bearing member adapted to be mounted on a support, a non-circular rock shaft, a bushing loosely fitting said rock shaft and journaled in said bearing, a switch blade, and clamping means for securing said bushing to said shaft and for adjustably securing said blade to the bushing, whereby said blade may be adjusted angularly of the shaft.

4. In a multipole switch, a bearing member adapted to be secured to a fixed support, a non-circular rock shaft, a bushing loosely fitting said shaft, said bushing having an intermediate portion journaled in said bearing and end portions having external curved surfaces, an insulator pin having a surface adapted to bear upon said curved bushing surfaces, a clamping plate adapted to clamp said bushing to the shaft and to clamp the insulator pin to said curved bushing surfaces, an insulator secured to said pin, and a switch blade mounted on said insulator.

5. In a multipole switch, a bearing member adapted to be secured to a fixed support, a non-circular rock shaft, a bushing having a non-circular bore loosely fitting said shaft, said bushing having an intermediate portion journaled in said bearing and end portions having external curved surfaces, an insulator, a switch blade secured to said insulator, an arm to which said insulator is secured, one end of said arm having surfaces adapted to bear against said curved bushing surfaces, and means including a clamping plate adapted to adjustably secure said arm to said bushing and to fix said bushing with respect to said shaft.

6. In an electrical switch, a rock shaft, a bushing secured to said shaft, a bearing adapted to be secured to a support, a spherical surface on said bushing serving to journal the same in said bearing, a switch blade, and means for adjustably securing said switch blade to said bushing.

7. In a multipole electrical switch, a non-circular rock shaft, a bracket, a pair of arms

secured to said bracket and having spaced ends thru which said shaft can be positioned between said arms, a bushing secured to said shaft and bearing upon the journal provided
5 by said arms, a switch blade, and means for adjustably securing said blade to said bushing.

8. In an electrical switch, a non-circular rock shaft, a bushing disposed on said shaft
10 and non-rotatable with respect to the same, a bracket in which said bushing is journaled, a switch blade, a member to which said blade is secured, and common means for clamping said bushing to said shaft and for effecting
15 angular adjustment of the blade with respect to said shaft.

In testimony whereof, I have hereunto set my hand.

JAMES C. REA.

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