Nov. 27, 1928. 1,693,126

T. VAN RYAN ET AL

ADJUSTABLE LOCKING BEARING

Filed Sept. 27, 1926 2 Sheets-Sheet 1

Fig. 1.

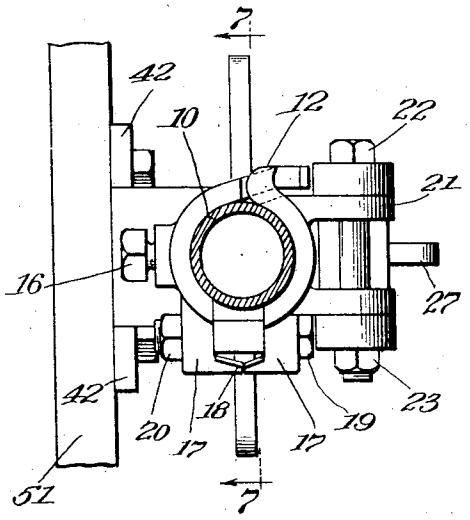


Fig. 2.

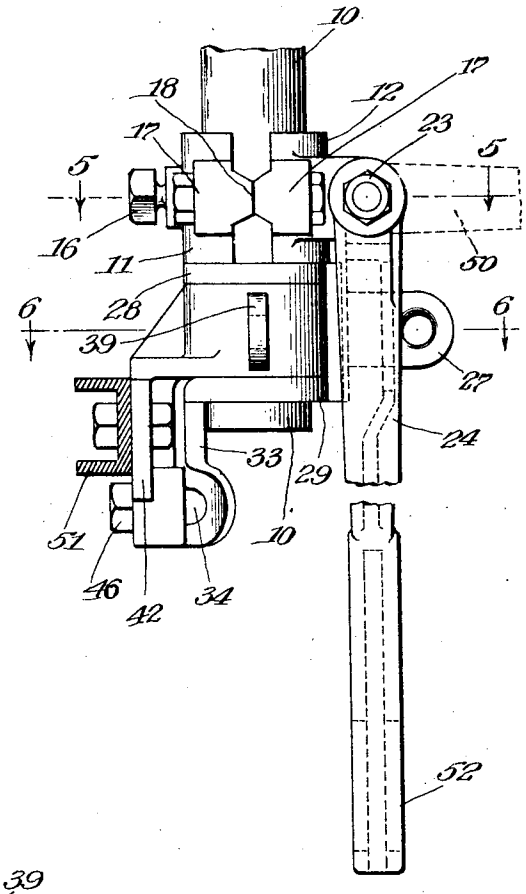


Fig. 3.

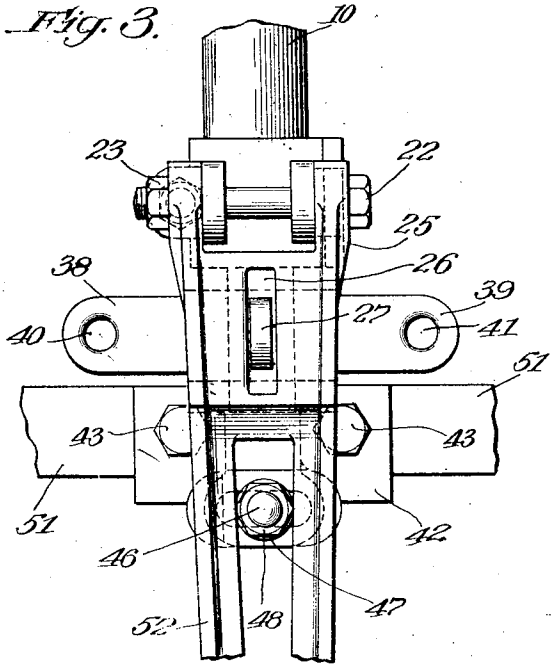
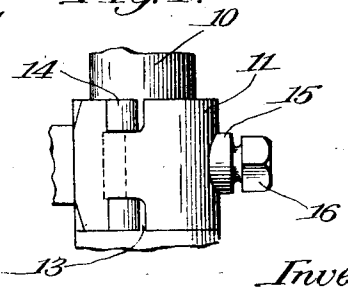


Fig. 4.



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Fig. 5.

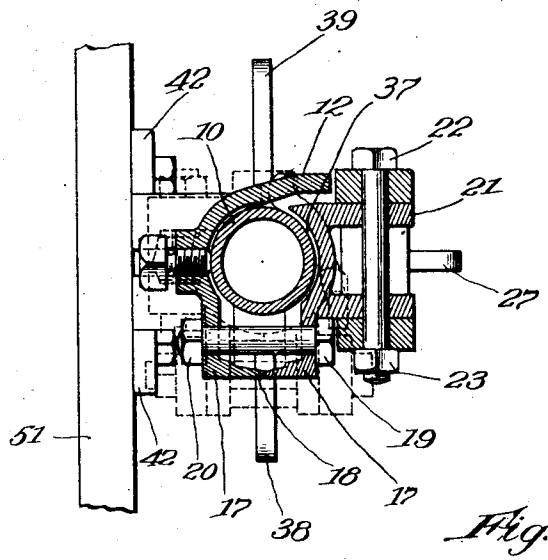


Fig. 6.

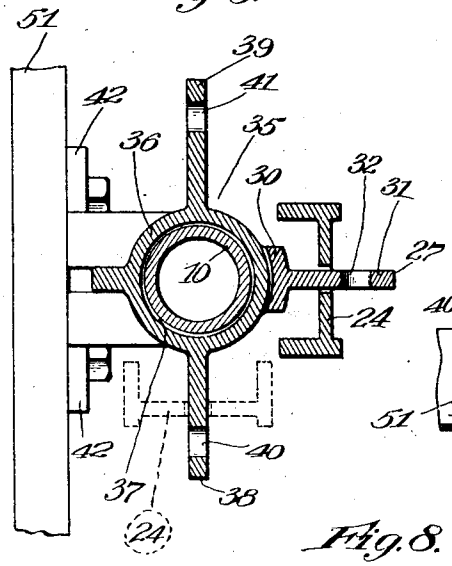


Fig. 7.

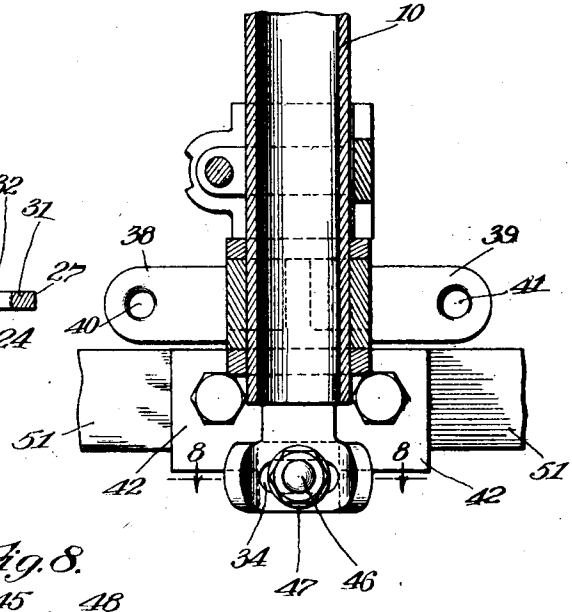
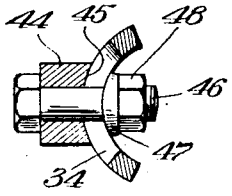


Fig. 8.



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UNITED STATES PATENT OFFICE.

TONY VAN RYAN AND ALFRED ALSAKER, OF CHICAGO, ILLINOIS, ASSIGNORS TO THE DELTA-STAR ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

ADJUSTABLE LOCKING BEARING.

Application filed September 27, 1926. Serial No. 137,929.

The present invention relates to an adjustable locking bearing for electric switches, or the like.

It is common practice to operate switches by a pipe shaft moved by a handle pivoted to the shaft. The handle is adapted to be folded parallel to the shaft and locked by means of a stationary lug passing through the handle or embracing the same. A padlock is then used to lock the handle in position with the switch either closed or open.

When the parts are assembled, the switch contacts may not be in the fully open or closed position when the handle registers with the locking tongue. According to our invention we make the locking tongue adjustable angularly about the shaft so that it may be brought into register with the handle when the switch member or other operated parts are in the desired position. We do not wish to be limited to a tongue and slot, nor to the specific arrangement of the parts, except as they are specifically recited in the claims. We embody the adjustable locking device in a bearing for the pipe or shaft.

Now, in order to acquaint those skilled in the art with the manner of constructing and operating a device embodying our invention, we shall describe in connection with the accompanying drawings a specific embodiment of the same.

In the drawings:—

Figure 1 is a top plan view of the invention;

Fig. 2 is a side elevational view of same showing the manner in which it is mounted;

Fig. 3 is a front elevational view;

Fig. 4 is a side elevational view of the clamping member for the switch operating shaft;

Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 2;

Fig. 6 is another sectional view taken on line 6—6 of Fig. 2;

Fig. 7 is a sectional view taken on line 7—7 of Fig. 1; and

Fig. 8 is a sectional view taken on line 8—8 of Fig. 7 showing the locking means for the adjustable tongue.

The adjustable locking bearing of our invention is secured to the switch operating shaft 10 by means of a pair of clamping members 11 and 12. At one end the clamping member 11 is provided with a pair of notches 13 with which the hooks 14 on the clamping member 12 are adapted to co-operate. It will be noted that the projecting fingers or hooks 14 form what might be called a hinge joint between the clamping members. It is obvious that a joint of this sort is not essential and that the clamping members 11 and 12 may be made integral at this point. However, we find that this construction permits the clamping members to get a better and tighter hold on the shaft. A boss 15 on the clamp 11 is threaded to receive a set screw 16 which aids in holding the clamping members securely to the shaft 10. Each of the clamps is also provided with a clearance 37 which extends through the central portions thereof. This clearance is illustrated in Fig. 5, and permits the set screw 16 to draw the clamping members together so that contact with the shaft 10 may be had on each side of the clearance. At the ends opposite the hooks and notches 13 and 14, respectively, the clamps 11 and 12 are provided with integral bolting lugs 17 which are provided with the stops 18. The lugs 17 have registering openings through which a bolt 19 is adapted to pass. As the bolt 19 is drawn into its co-operating nut 20, the projecting stops 18 are brought into contact with each other. In so doing they permit the clamps to get a firm hold on the shaft 10, and also limit the bending of the lugs toward each other. A pair of lugs 21, which are formed integral with the clamp 12, are also provided with registering apertures through which extends a standard machine bolt 22. The bolt 22 threads into a nut 23 and permits pivotal mounting of the switch operating handle 24 with the lugs 21

The handle 24 is preferably made of malleable iron, but it may be also made of any other material which possesses the necessary strength and rigidity. It is provided with a pair of integral arms 25 by means of which it is pivotally mounted on the machine bolt 22. An opening 26 permits the handle to clear a lug on the adjustable tongue 27, so that it may be locked in place in a manner to be hereinafter described.

The adjustable tongue 27 comprises a pair of collars 28 and 29 which are adapted to

snugly encircle the operating shaft 10. These collars are connected together by means of an integral neck portion 30 from which extends out laterally, in a generally horizontal direction, a lug 31. The lug 31 is provided with an opening 32 which is adapted to receive a suitable padlock for preventing unauthorized manipulation of the operating handle 24 when the opening 26 therein and the lug 31 are in engagement. Extending downwardly from the collar 29 is the tongue portion 33. This comprises a generally circular neck which is integral with one side of the collar 29. The neck merges into another member which is also generally circular in form. In this latter member we provide an arcuate slot 34 by means of which the necessary adjustments of the bearing member may be made.

The support or mounting member for the bearing is generally designated by the numeral 35. It comprises a collar 36 in which the shaft 10 is journalled. The inner surface of the collar 36, is provided with a clearance in the central portion thereof, so as to permit a snug fit with the shaft 10 at both the upper and lower portions of the collar 36. Extending out laterally from opposite sides of the collar are a pair of lugs 38 and 39 having openings 40 and 41, respectively. These lugs are spaced substantially 180° apart and their purpose and the purpose of the openings therein will be hereinafter described. The support member 35 also has formed integral therewith a mounting portion 42. This portion is formed integral with and extends downwardly from one side of the collar 36. It is provided with a pair of openings through which extend the bolts 43 for securing the mounting member to a channel 51 or other suitable support means for the bearing. Along the lower edge of the mounting portion 42, I provide a block 44 having a generally concave surface 45. The curvature of the surface 45 has the same radius as that of the lower portion of the tongue 33 which contacts with it. It is provided with a bolt opening through which extends the bolt 46. The arcuate opening 34 in the tongue 33 is of substantially the same width as the bolt opening in the block 44 so as to permit the bolt 46 to also extend therethrough. Mounted on the bolt 46 and adapted to co-operate with the inner concave surface of the tongue 33 is a washer 47. It is provided with a convex outer surface which has the same radius of curvature as the inner surface of the lower portion of the tongue 33. The opposite surface of the washer 47 is substantially flat so as to permit a nut 48 to be brought into firm contact therewith. By tightening the nut 48 the washer 47 is firmly clamped against the tongue 33 which in turn is clamped in place against the block 44. Adjustment of the tongue relative the block 44 may be had by loosening the nut 48, thereby permitting the upper portion of the tongue to turn independently of the support member 35.

To operate a switch employing our device, it is first necessary to remove the padlock which holds the switch operating handle in place. When the padlock is removed, the handle is lifted from its vertical position, which it occupies when the switch is left open or closed, into a horizontal position as indicated by the numeral 50 in Fig. 2. When the handle is in this position, it may be turned either to the right or left for opening or closing the switch. Let us assume that before the padlock has been removed that the operating handle was engaged with the lug 31 on the adjustable tongue 27. When the handle is in this position the switch blades are normally in contact with each other. Now, when the handle is lifted into the horizontal position to permit its turning to the right or left, it is free of any members which might prevent turning thereof. Hence, it might be turned either clockwise or counter-clockwise to open the switch. The direction in which it will be turned will depend on the structure of the switch operating mechanism, which in this case forms no part of the present invention. After the switch has been opened, the handle is turned until the opening 26 therein is in substantially the same vertical plane as one of the lugs 38 or 39. If it has been turned in the clockwise direction, it will now be in a position to permit its engagement with the lug 38. It is then closed in this position by means of a suitable padlock which is adapted to cooperate with the opening 40 in the lug.

Hence, it is obvious from the above that the adjustable feature lends itself especially in permitting accurate closing of the switch. The correct adjustment of the tongue is secured by first turning the operating handle until the switch contacts are in proper co-operation with each other. When this result is had, the operating handle is lowered into its vertical position. If the tongue 27 is properly adjusted, the lug 31 will enter the opening 26 in the handle. If the tongue is not properly adjusted, the lug 31 will not enter the opening 26, but will strike the web portion of the handle at some point adjacent the opening. Now, by loosening the nut 48 on the bolt 46, the tongue 27 may be turned about the operating shaft 10 a sufficient angular distance so that the lug 31 will freely enter the opening 26 in the operating handle 24. When this adjustment is had the lock nut 48 is again tightened so that the adjustable tongue is firmly held in fixed position.

We also provide an opening 52 at the lower end of the handle which may be used when it is desirable to secure the handle to the operating shaft 10 at some point above the bearing member itself. The procedure for adjusting the bearing member with respect to

the switch contacts as outlined above, is also followed when the lower opening is used for locking the handle in place.

Hence, it is seen that with the adjustable feature of our invention, it is possible to get accurate alignment of the co-operating switch contacts after the device has been installed without in any manner changing the size of the parts to get them to permit accurate alignment of the switch blades. This structure, therefore, obviates the necessity of carefully machining the parts, and hence a device of our construction may be easily and quickly assembled at the place where it is to be used. It is also known that the switch blades will, in the course of time, get out of alignment, so that unless some means is provided for adjusting the amount of turning required to get them into proper contact, good contact between the parts will not be had.

Other highly desirable features of the invention are its relative simplicity and its low manufacturing cost. It will be noted that very little manual labor is required to complete the device. The parts are preferably made of malleable iron and little or no machining is necessary to get them to fit properly with respect to each other.

We do not wish to be limited to the details shown and described.

We claim:—

1. In combination, a switch operating shaft, an operating handle for said shaft, a support for said shaft, and adjustable means mounted on said support to which said handle may be secured in fixed position relative to said support.

2. In combination, a switch operating shaft, a handle for turning said shaft, a support for said shaft, an adjustable member rotatably mounted on said support to which said handle may be secured.

3. In combination, a switch operating shaft, a handle for said shaft, means for securing said handle to said shaft, said means comprising a pair of clamps hinged at one end and bolted together at the opposite end, a support, an adjustable tongue on said support, and means on said adjustable tongue adapted to co-operate with said handle for holding it in a fixed position.

4. In combination, a switch operating shaft, a clamping member secured to said shaft, an operating handle for said shaft pivotally connected to said clamping member, a support for said shaft, an adjustable tongue rotatably mounted on said support, and means integral with said tongue and adapted to co-operate with said handle for preventing turning of said operating shaft relative said support.

5. In combination, a switch operating shaft, means for turning said shaft, and securing means for said turning means, said securing means being adjustable to permit securing of said turning means only when the operating shaft is in a predetermined position.

6. In combination, a support for a switch operating shaft, an adjustable tongue mounted on said support, and means for securing said tongue to said support.

7. In combination, a support for a switch operating shaft, an adjustable tongue rotatably mounted on said support, and means extending through said tongue for securing it to said support.

8. In combination, a support for a switch operating shaft, an adjustable tongue rotatably mounted on said support, said tongue having a slotted downwardly extending portion, and means adapted to co-operate with the slot in said downwardly extending portion for securing said tongue to said support.

9. In combination, a support for a switch operating shaft, said support comprising a bearing portion and a mounting portion, a tongue rotatably mounted on said bearing portion, said tongue having a neck extending downwardly therefrom, said neck having a convex surface, means on said support adapted to contact with a portion of said convex surface, and means extending through said contact means and said neck for securing said tongue to said support.

10. In combination, a support for a switch operating shaft, said support comprising a bearing portion and a mounting portion, an adjustable tongue mounted on said bearing portion, a downwardly extending portion having a slot substantially adjacent its lower end integral with said tongue, means for spacing the lower end of said tongue from said support, and means extending through said support, said spacing means and said tongue for securing said spacing means and said tongue in fixed relation with respect to said support.

11. In combination, a switch operating shaft, a handle for turning said shaft, a support for said shaft, an adjustable tongue mounted on said support, means on said support for holding said handle in fixed position when the switch is open, and means on said tongue for holding said handle in fixed position when the switch is closed.

12. In combination, a mounting member, a support secured to said mounting member, a switch operating shaft rotatably mounted in said support, a handle secured to said shaft for rotating same, and means rotatably mounted on said support and adapted to co-operate with said handle for limiting the turning movement of said handle.

13. In combination, a switch operating shaft, a support for said shaft, an operating handle for turning said shaft into opening and closing position, means on said support

adapted to co-operate with said handle when the switch is opened, an adjustable tongue rotatably mounted on said support, and means on said tongue intermediate the means on said support for holding the handle against turning when the switch is closed.

14. In combination, a switch operating shaft, a support for said shaft, an operating handle for said shaft, said handle having a relatively horizontal position for turning said shaft, and a relatively vertical position when it is locked against turning, and adjustable means adapted to co-operate with said handle when it is in its vertical position to prevent unauthorized turning thereof.

In witness whereof, we hereunto subscribe our names this 23rd day of September, 1926.

TONY VAN RYAN.
ALFRED ALSAKER.