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CIRCUIT MAKER AND BREAKER
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2,513,754

FIG 1

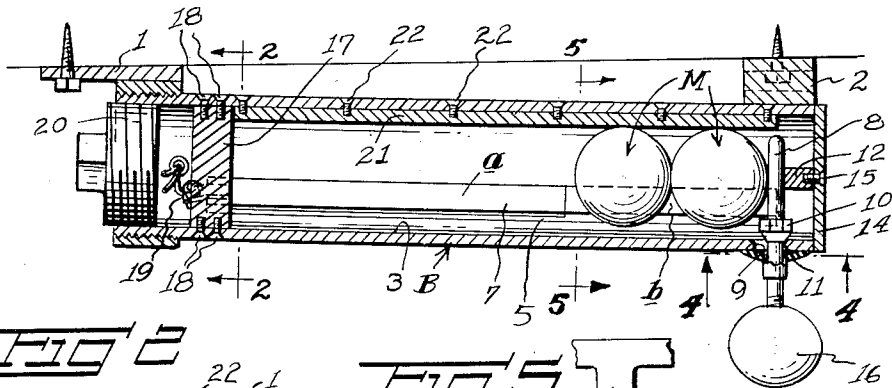


FIG 2

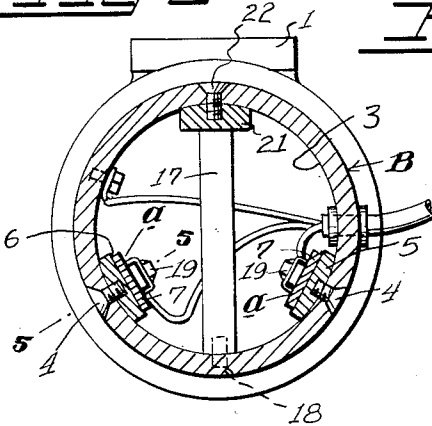


FIG 3

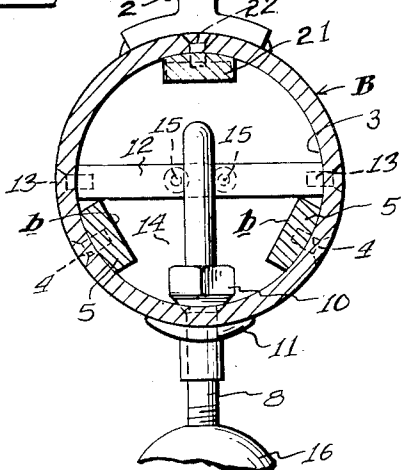


FIG 4

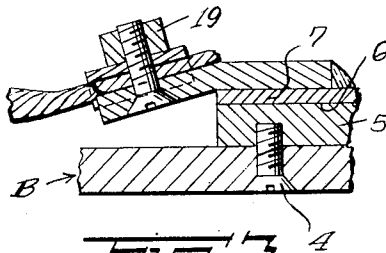
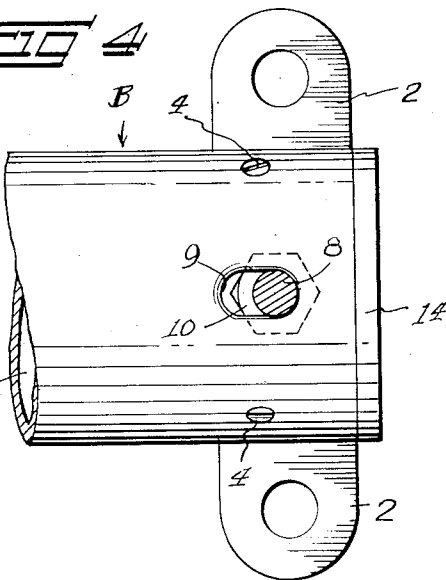


FIG 5

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2,513,754

CIRCUIT MAKER AND BREAKER

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2 Claims. (Cl. 200—52)

1

This invention relates to a circuit maker and breaker and it is an object of the invention to provide a device of this kind which is normally open and wherein impact means is provided operable at will to effect a momentary closing.

It is also an object of the invention to provide a device of this kind including a body having spaced runways of material conductive of electricity arranged side by side and along which is adapted to travel a freely movable member of conductive material for bridging the space between and closing a circuit through the runways.

Another object of the invention is to provide a circuit maker and breaker including a body provided with runways or tracks of a material conductive of electricity freely movable along the runways or tracks to bridge the space therebetween and close a circuit therethrough together with means for impelling the member along the runways or tracks.

A still further object of the invention is to provide a device of this kind embodying an elongated member for mounting with one extremity lower than the other with spaced tracks or runways extending therealong, the high portions of the tracks or runways being of a material conductive of electricity and the lower portions being non-conductive, together with a member conductive of electricity freely movable along the tracks or runway for bridging the space therebetween, said member being normally positioned on the low portions of the tracks or runways, and means at the low extremity of the elongated member for impelling the second member along the high portions of the track or runways, said second member returning by gravity to its normal position on the low portions of the tracks or runways.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved circuit maker and breaker whereby certain advantages are attained, as will be hereinafter more fully set forth.

In order that my invention may be better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:

Figure 1 is a longitudinal vertical section taken through a circuit maker and breaker constructed in accordance with an embodiment of the invention;

Figure 2 is a sectional view taken substantially on the line 2—2 of Figure 1;

2

Figure 3 is an enlarged detail view partly in section and partly in elevation illustrating a means for connecting an electrical conduction to one of the tracks or runways;

5 Figure 4 is a detail sectional view taken substantially on the line 4—4 of Figure 1 looking in the direction of the arrows with the dust washer omitted; and

10 Figure 5 is a sectional view taken substantially on the line 5—5 of Figure 1 looking in the direction of the arrows.

In the embodiment of the invention as illustrated in the accompanying drawing B denotes an elongated tubular body of desired dimensions and open at opposite ends. This member may be made of any material desired but preferably of metal for strength.

The device as herein comprised is particularly adapted for use in levels of mines or the like for controlling the operating circuit in connection with a solenoid type of mechanism for throwing the tongue of a track switch although it may be of course used for other purposes.

The opposite end portions of the body B have disposed transversely across the top thereof the mounting brackets 1 and 2 for attachment to the roof or ceiling of the level or the like. These brackets 1 and 2 are of types whereby the bracket 2 extends above or beyond the bracket 1, so that when the body B is in place, it will be assured said body B is disposed lengthwise on an angle to provide a high end portion and a low end portion for the bore 3 which is straight from end to end and of substantially the same diameter throughout. The bore 3 is also preferably circular in cross section at all points therealong.

35 Secured to the wall of the body B by the screws 4 or the like and extending a major distance therealong are the strips 5 of a material non-conductive of electricity and the high portion of each of said strips for a distance of approximately two-thirds its length it provided in its upper surface with a mortise or groove 6 in which is snugly fitted a strip 7 of a material conductive of electricity. The strip 7 is held in position by certain 45 of the screws 4.

The strips 5 are two in number and in parallelism. The strips 5 are also at opposite sides of the vertical center of the bore 3 and substantially equidistantly spaced therefrom. For the purpose of disclosure the portion of the body B carrying the brackets 1 and 2 is to be considered the top.

The top faces *a* of the strips 7 and the top 55 faces *b* of the low portions of the strips 5 are

3

flush so that there may be unhindered travel along said faces of the freely movable contact members M of a material conductive of electricity shown as spherical in form. The faces *a* and *b* provide runways or tracks along which the members M travel and the angle of inclination of the body B when in working position is such as to cause the members M normally to maintain a position upon the faces *b* to maintain the electric circuit open.

When the members M are in the normal position, the outermost member M contacts the inserted end portion of a striker arm 8 which extends into the bore 3 a desired distance through a slot 9 in the bottom portion of the wall of the body B at the low extremity thereof. The longitudinal axis of the slot 9 is disposed lengthwise of the body B and the arm 8 within the body B carries a surrounding head or part 10 contacting the wall of the body B from within whereby the arm 8 may be swung readily in a direction to impel the members M upon the faces *a* to close the electric circuit and such circuit will remain closed until the members M return to the faces *b*.

The enlargement or part 10 is of a diameter greater than the width of the slot 9 whereby the arm is maintained in place.

The arm 8 outwardly of the body B, but in close proximity thereto carries a surrounding dust washer 11 of yielding material such as a rubber compound. This washer 11 has close contact with the adjacent surface of the body B and is of a size to close the slot 9 and thus prevent ingress of dust or the like with the body B. This washer 11 also possesses a tension to facilitate maintaining the arm 8 or more particularly the portion thereof within the body B in a substantially vertical position in a position substantially radial of the bore 3.

The outward swinging movement of the inserted portion of the arm 8 is definitely limited by contact with a member 12 within the low end of the bore 3 and held with the body B by the screws 13 disposed through the wall of the body B and engaging the ends of the members 12. The adjacent open end of the body B is closed by the plate 14, removably held in place by screws 15 disposed through the plate 14 and engaging the member 12.

The outer or external extremity of the arm 8 carries an enlarged head 16 of a weight to provide further means to maintain the arm 8 in its vertical position. When it is desired to close the electric circuit the head 16 is engaged by a trainman or other person to swing the inserted end portion of the arm 8 inwardly of the body B or in a direction toward the high end thereof. This will result in the members M being projected onto the faces *a* to close the circuit.

The extent of movement of the members M is limited by contact of the inner member M with a stop strip 17 within the high end portion of the body B and disposed substantially radial thereof. This strip 17 is herein disclosed as held in place by the screws 18 disposed through the wall of the member B and engaging the ends of the strip 17.

The outer end portion of each of the strips 7 is provided with a suitable means as at 19, for holding in electrical connection therewith one of the conductors of the circuit in which is interposed the maker and breaker.

The high open end of the body B is herein disclosed as being closed by a removable plug 20 threading therein. The strips 5, 7 and 17 are so

4

placed as to offer no obstruction to the insertion of the plug 20.

Within the bore 3 and extending lengthwise of the body B is a strip 21 of a material non-conductive of electricity. This strip is secured to the top of the wall of the body B midway between the strips 5 and as held in place by the screw 22 or otherwise as may be preferred.

The strip 21 prevents contact of the members M with the wall of the body B to avoid interference with the desired electric circuit.

It is preferred that a plurality of members M be used so that a constant closing of the circuit will be assured when the members M are upon the faces *a*. While a single member M may be used it is preferred they be in multiple as with only a single member M there is a liability of arcing in the event the member M, for any reason, when it is on the faces *a*, should separate from said faces. With the use of more than one member M, proper effective contact will be assured.

From the foregoing description it is thought to be obvious that a circuit maker and breaker constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated.

I claim:

1. An electric circuit making and breaking device, comprising a relatively long tubular housing, means for mounting the same at an inclination whereby one end is lower than the other end, a pair of strips disposed in spaced side by side relation in and lengthwise of the lower side of said housing, each strip including an electric current conducting element through a portion of its length to the end thereof which is adjacent to the high end of the housing, an electric current conducting ball supported on the strip to roll therealong, means in the lower end of the housing facilitating the driving of the ball to the higher end thereof, means in the higher end of the housing for checking the movement of the ball short of such higher end, removable means for closing the said higher end of the housing, means for leading current conductors into the housing between said closing means and the ball checking means, means for electrically coupling the current conductors to the said conducting elements, the said housing closing means and the ball movement checking means being spaced apart to provide a space for said conductors, and a third strip of non-conducting material disposed lengthwise of the interior of the housing upon the top part of the wall and forming with the first mentioned strips a confining space for the current conducting ball.

2. An electric circuit making and breaking device, comprising a relatively long tubular housing, means for mounting the same at an inclination whereby one end is lower than the other end, a pair of strips disposed in spaced side by side relation in and lengthwise of the lower side of said housing, each strip including an electric current conducting element through a portion of its length to the end thereof which is adjacent to the high end of the housing, an electric current conducting ball supported on the strips to roll therealong, means in the lower end of the housing facilitating the driving of the ball to the higher end thereof, means in the higher end of the housing for checking the movement of the ball short of such higher end, removable means for closing the said higher end of the housing,

5

means for leading current conductors into the housing between said closing means and the ball checking means, means for electrically coupling the current conductors to the said conducting elements, the said housing closing means and the ball movement checking means being spaced apart to provide a space for said conductors, the said means for facilitating the driving of the ball to the higher end of the housing being adapted for hand operation and comprising a relatively long striker arm disposed in an opening in the housing wall at the lower end of the housing whereby one end of the arm is extended into the housing across the path of movement of the ball and the other end of the arm extends to the outside of the housing, the said other end of the arm carrying a head, and resilient means

6

encircling the arm and disposed over the opening in the housing wall through which the arm passes whereby to effectively prevent entrance of dirt through the opening and to maintain the arm in a prescribed position

5

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REFERENCES CITED

The following references are of record in the
10 file of this patent:

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15