C. CLAUSEN.

PULL SWITCH FOR ELECTRIC MINE SIGNALS.

APPLICATION FILED APR. 19, 1916.

1,217,707.

Patented Feb. 27, 1917.

Fig. 1,

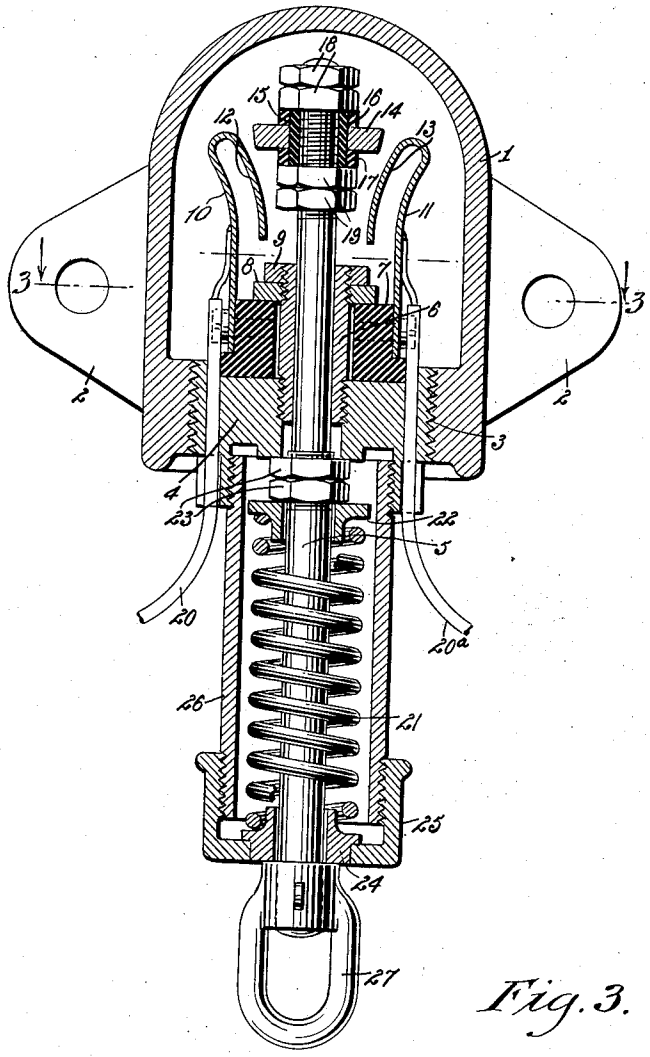


Fig. 2,

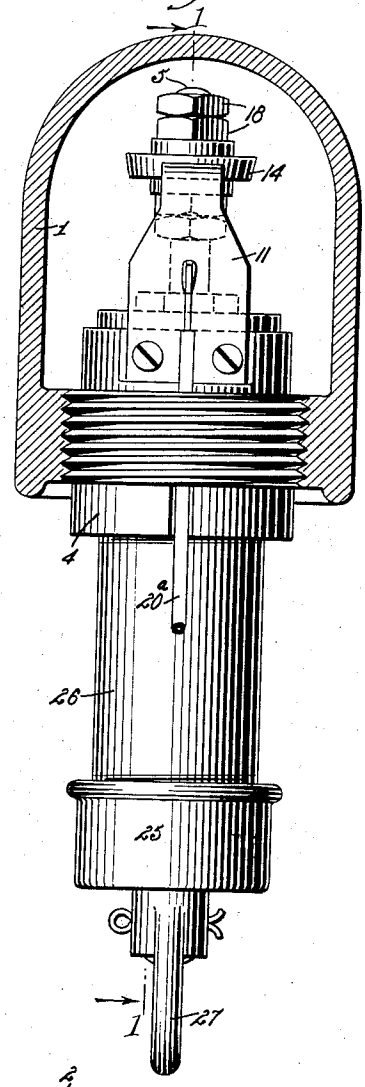
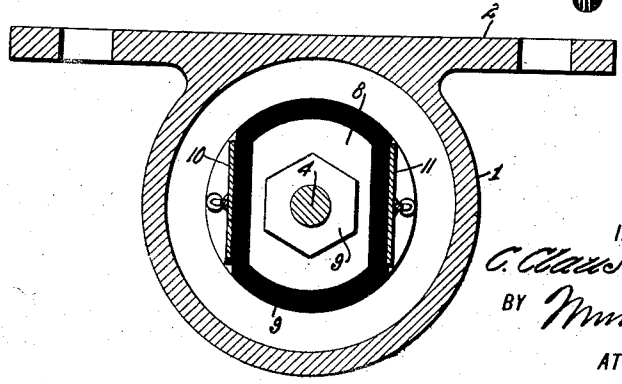


Fig. 3.



WITNESSES

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CARL CLAUSEN, OF BISBEE, ARIZONA.

PULL-SWITCH FOR ELECTRIC MINE-SIGNALS.

1,217,707. Specification of Letters Patent. Patented Feb. 27, 1917.

Application filed April 19, 1916. Serial No. 92,171.

To all whom it may concern:

Be it known that I, CARL CLAUSEN, a citizen of the United States, and a resident of Bisbee, in the county of Cochise and State of Arizona, have invented a new and Improved Pull-Switch for Electric Mine-Signals, of which the following is a full, clear, and exact description.

This invention relates to electric switches, and more particularly to a pull switch for use in mine signals whereby a signal from a lower level can be transmitted to the engineer's station, although the invention is not necessarily limited to this particular use.

The invention has for its general objects to improve and simplify the construction and operation of pull switches so as to be reliable and efficient in use, comparatively inexpensive to manufacture, and so designed that it will positively automatically open when the pull for closing the switch is released.

A more specific object of the invention is the provision of a normally open switch having a novel arrangement of contacts and actuating means for the movable contact, whereby the reliability of the switch is secured.

With such objects in view and others which will appear as the description proceeds, the invention comprises various novel features of construction and arrangement of parts which will be set forth with particularity in the following description and claims appended hereto.

In the accompanying drawing which illustrates one embodiment of the invention and wherein similar characters of reference indicate corresponding parts in all the views,

Figure 1 is a vertical longitudinal section of the switch on the line 1—1, Fig. 2;

Fig. 2 is a side view with the casing or housing in section; and

Fig. 3 is a horizontal section on the line 3—3, Fig. 1.

Referring to the drawing, 1 designates a suitably shaped housing provided with apertured ears 2, whereby the housing can be fastened to a support. The housing is closed at all points, except the bottom, which is provided with a threaded opening 3 into which is screwed a plug 4. Extending through the plug is a vertically movable rod 5 slidable in a guide 6 which is a pipe nipple. This nipple is screwed into the plug 4 and is disposed in the housing 1. Surrounding the nipple is a ring 7 of insulation clamped in place against the plug 4 by a locking plate 8 and a nut 9. Fastened to opposite sides of this block 7 of insulation are upwardly extending metallic springs 10 and 11, and the upper ends of these springs are bent inwardly and downwardly to form yielding contacts 12 and 13 which are spaced apart at opposite sides of the upper end of the rod 5. This rod 5 carries an annular bridging contact 14 which is adapted to engage the contacts 12 and 13. The contact 14 in insulated from its carrying rod 5 by a sleeve of insulation 15 and is clamped in place between rings of insulation 16 and 17 which are in turn held in place by nuts 18 and 19 threaded on the rod 5. The relatively stationary contacts are connected respectively with circuit wires 20 and 20^a which pass in through openings in the plug and are connected respectively with the contacts 10 and 11. The switch is normally open, with the bridging contact 14 disengaged from the contact springs. A spring 21 encircles the lower end of the rod 5 and operates upwardly on the same to hold the switch open. The spring has its upper end bearing on an abutment in the form of a ring 22 which surrounds the rod 5 and is adjustably held in place by nuts 23 screwed on the rod. These nuts form a shoulder engageable with the plug 4 to limit the upward movement of the rod, and by adjusting the nuts the tension of the spring 21 can be varied. The lower end of the spring bears against an abutment 24 which is carried by a cap 25 screwed on the lower end of a pipe nipple 26 that is in turn screwed into the plug 4. On the lower end of the rod 5 is a loop or equivalent device 27 for enabling a chain, cable or its equivalent to be fastened to the movable element of the switch, whereby the latter can be controlled from a remote point. By pulling downwardly on the rod 5 the switch contacts can be engaged for closing the signal circuit and by a pre-arranged code signals may be transmitted by the frequency or duration of the closings and openings of the circuit through the engagements and disengagements of the contacts 12, 13 and 14. It will be observed that the various parts of the switch, together with its op-

erating means, are effectively housed so that the switch can be kept indefinitely in operative condition.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and method of operation will be readily understood by those skilled in the art to which the invention appertains, and while I have described the principle of operation, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made when desired as fall within the scope of the appended claims.

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

1. A switch comprising a housing having an opening, a plug inserted in the opening, a rod extending through the plug, a tubular member fastened to the plug and disposed within the housing, a ring of insulation surrounding the tubular member, a nut screwed on the tubular member for clamping the insulation to the plug, contacts fastened to and insulated from each other by the insulation ring, a bridging contact fastened to and insulated from the rod and adapted to engage the first-mentioned contacts, a spring on the rod normally operating to hold the bridging contact separated from the first-mentioned contacts, a housing disposed outside the first housing inclosing the spring and rod, and means connected with the rod for moving the same against the tension of the spring to close the circuit through the switch.

2. A switch of the class described comprising a housing, a longitudinally movable rod extending into the housing, a contact carried by and insulated from the inner end of the rod, spring contacts mounted in the housing and insulated from it and from each other and arranged to be engaged by the first-mentioned contact, a spring encircling the rod and disposed on a portion outside the housing, a housing having a threaded connection with the first-mentioned housing to inclose the spring, means within the second-mentioned housing for adjusting the tension of the spring and limiting the movement of the rod, and a device fastened to the rod after the second housing is fastened in place and adapted to connect the rod with an actuating element.

3. A switch of the class described comprising a housing having a threaded opening, a plug screwed into the opening, a tubular member screwed into the plug, an insulation ring surrounding the tubular member, means on the tubular member for clamping the ring in place, contacts fastened to the ring and insulated from each other, a rod extending through the plug and tubular member, a contact carried by and insulated from the rod and arranged to engage the first-mentioned contacts, a tubular element having a threaded connection with the plug and disposed outside the housing and surrounding the portion of the rod disposed exterior to the housing, a spring surrounding the rod and disposed within the tubular element, a cap screwed on the tubular element and having an abutment for one end of the spring, an abutment on the rod for the opposite end of the spring, a nut on the rod for adjusting the position of the last-mentioned abutment to vary the tension of the spring and also forming a stop for limiting the movement of the rod in one direction, and means for permitting an actuator to be attached to the rod.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL CLAUSEN.

Witnesses:
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ERNEST J. BEYER.