

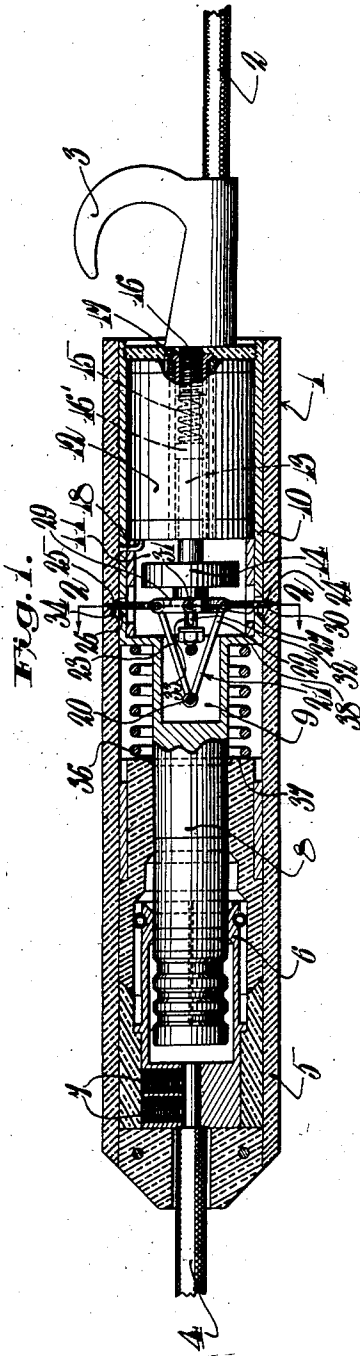
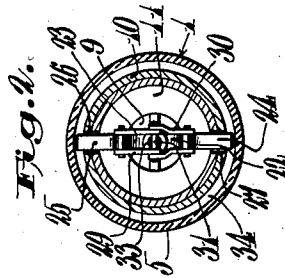
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1,678,205

C. W. WYMAN

BLOW-OUT DEVICE

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UNITED STATES PATENT OFFICE.

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BLOW-OUT DEVICE.

Application filed April 10, 1922. Serial No. 551,388.

My invention relates to blow out devices, and more particularly to safety blow out devices for use on mining mechanisms.

An object of my invention is to provide an improved blow out device. Another object of my invention is to provide an improved blow out device for use on mining mechanisms. A further object of my invention is to provide an improved blow out plug which may be employed in the flexible connections between a power line and a machine to which current is to be supplied and which with particular advantage may be employed in the connection leading from a trolley wire to a mining mechanism. Other objects and advantages of my invention will hereinafter more fully appear.

In the accompanying drawing I have shown for purposes of illustration one form which my invention may assume in practice.

In these drawings,—

Fig. 1 is a central longitudinal section through the illustrative embodiment of my invention.

Fig. 2 is a transverse section on the line 2—2 of Fig. 1.

In its illustrative form my invention is shown embodied in a connector member generally indicated by 1 which is adapted to be disposed between a line 2 or hook 3 which are connectible to a suitable source of current, for example, a trolley in a mine, and a line 4 leading to mining machine or similar mechanism which is located at a point removed from the trolley wire when in operation. It is obvious that it is desirable that if there is to be a breaking of the circuit due to excessive current, this breaking of the circuit shall take place, at a point where the probabilities of gas are less than at the working face and in view of this fact I suggest the location described.

My improved mechanism comprises an insulating casing 5 in which at one end there is received an elastic socket member 6 connected as at 7 to the cable 4 leading to the mining mechanism. Cooperating with the socket member 6 is a connector element 8 which may be, and preferably is, of the form described in Patent No. 1,441,193, granted Jan. 2, 1923, in which mechanism the combined functions of a connector and a blow out are obtained. The connector element 8 is provided at its rear end with a bore 9 and an enlarged annular sleeve member 10 with-

in which bore and sleeve member suitable automatic means cooperating in effecting the breaking of the circuit by the disconnection of the elements 6 and 8 is arranged. Within the bore 11 of the sleeve member 10 is an over-load coil 12 in a bore in which is reciprocable the plunger 13 of an armature member 14, and a spring 15 of suitable strength to prevent operative movement of the armature except in case of the transmission of excessive current through the coil 12, is arranged between the plunger 13 and a threaded stem 16 on the trolley hook 3, a suitable insulating bushing 16' being interposed between the spring and stem. The opposite ends of the coil are connected as indicated at 17 and 18 respectively to the hook 3 and to the sleeve member 10. Within the bore 9 upon a pivot 20 is mounted a spring member 21 having oppositely disposed reversely bent arms 22 and 23 whose outer portions 24 and 25 respectively project through openings 26 and 27 in the sleeve member 10. This spring member consists of a spring rod having a central portion bent to surround the pivot 20 and its action is such as to tend to spring the ends of the arms farther apart. At the ends of the arms 22 and 23 there are pivotally connected toggle links 29 and 30, respectively, which links are connected by a pin 31 which extends through a slot 32 in an extension 33 of the armature plunger 13. An annular groove 34 is formed within the insulating member 5 and into this the extremities of the arms 24 and 25 extend during the time when the connector is in operative circuit closing position. A heavy spring 36 extends between a shoulder 37 of insulating material within the sleeve 5 and a shoulder 38 constituting the juncture between the portions of different diameters of the member 8.

From the foregoing description the mode of operation of this device will be readily apparent. When the parts have been assembled, as may be done by shoving the member 8 and the parts attached thereto toward the left into the member 5 (the arms 24 and 25 being pressed in sufficiently to permit them to enter the member 5) and when the parts reach the position shown, that is, with the circuit closed through the connector elements 6 and 8, the arms 24 and 25 will seat in the groove 34 and the parts will be locked in position, the spring 15

forcing the plunger 13 forwardly and causing the toggle links 29 and 30 to assume the positions shown herein. It will be evident that the arms 24 and 25 will tend to remain in position in the groove 34. Upon the flow of an excessive current through the coil 12, a sufficient attraction will be produced to move the plunger 13 and armature 14 far enough to cause the end of the slot 32 to strike the pin 31 and break the toggle, thereby drawing in the members 24 and 25 and releasing the member 8 and permitting the same to be forcibly ejected from within the member 5 by the spring 36. It will be observed that normal current flow through the coil 12 will cause the plunger 13 and armature 14 to move certain amounts toward the right, compressing the spring 15 to certain degrees, this being possible by reason of the slot and pin connection 31 and 32 with the toggle mechanism, and that it is only when an excessive current flows through the coil that the toggle links will pull in the latch arms 24 and 25. It will also be clear that in the event of an over-loading, the circuit will be broken at a point remote from the working face of the mine and from the proportions of the parts shown it will be observed that all danger of ignition of possible gases in the entry will be prevented by reason of the fact that the circuit will have been broken between the parts 6 and 8 and the arc extinguished before the shoulder 38 reaches the rear end of the member 5.

While I have in this application specifically described one form which my invention may assume in practice, it will be understood that this form of the same is shown for purposes of illustration and that the invention may be modified and embodied in various other forms without departing from its spirit or the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. In a circuit breaker, a casing, a contact member fixed in said casing, a cooperating movable contact member telescopically received in said casing, catch means carried by said movable member and engaging said casing for maintaining said contact members in operative assembled relation, means responsive to excessive current flow for releasing said catch means, and means for eject-

ing said movable contact member from said casing on release of said catch means.

2. In a circuit breaker, a casing having an interior annular groove, a contact member fixed in said casing, a connector member telescopically received in said casing carrying a contact portion telescopically received by said fixed contact member, catch means carried by said connector member and engaging in said annular groove for maintaining said contact members in operative assembled relation, means responsive to excessive current flow for releasing said catch means, and means for automatically separating said contacts on release of said catch means.

3. In a circuit breaker, a casing having a contact member fixed in one end thereof, a cooperating movable contact member telescopically received in said casing, movable catch elements carried by said movable member and engaging said casing for maintaining said contact means in operative assembled relation, means responsive to excessive current flow for releasing said catch elements, said latter means comprising a coil, a spring controlled movable armature adapted to be controlled by current in said coil, a connection between said armature and catch elements, and means for separating said contact members on release of said catch elements.

4. In a circuit breaker, a casing having an interior annular groove, a contact member fixed in one end of said casing, a connector member in said casing carrying a contact portion telescopically received by said fixed contact member, movable catch elements carried by said connector member and engaging in said annular groove for maintaining said contact members in operative assembled relation, means responsive to excessive current flow for releasing said catch elements, said latter means comprising a coil, a spring controlled armature cooperating with said coil, a pair of toggle links connected to said catch elements, and a lost motion connection between said toggle links and armature, and a compression spring mounted in said casing for ejecting said connector member on release of said catch elements.

In testimony whereof I affix my signature.

CHARLES W. WYMAN.