Aug. 27, 1929. L. A. BROWN 1,726,053

SAFETY COUPLER

Filed Oct. 10, 1927

Fig. 1

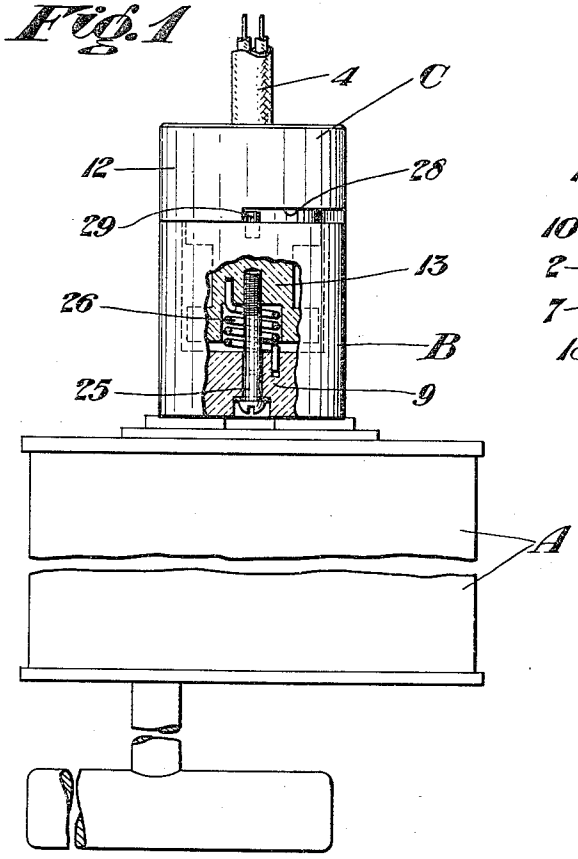


Fig. 3.

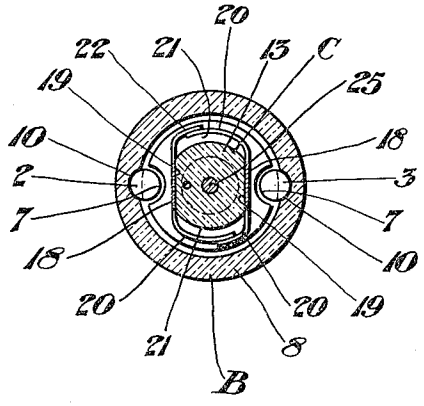


Fig. 2.

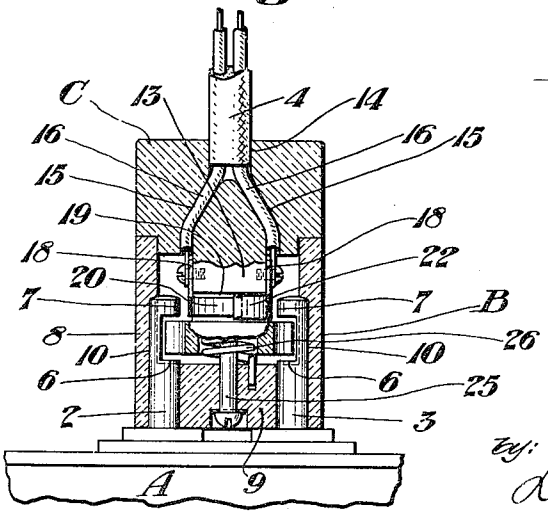
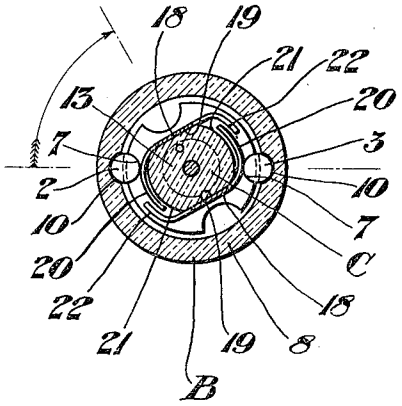


Fig. 4.



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UNITED STATES PATENT OFFICE.

LADURA ALEXANDER BROWN, OF UNIONTOWN, PENNSYLVANIA.

SAFETY COUPLER.

Application filed October 10, 1927. Serial No. 225,101.

This invention relates to electric couplers or connectors and more particularly to couplers for connecting shot firing cables used in mines to a magneto, battery or other source of current.

The principal object of the present invention is to provide a coupler of this class which will normally short-circuit the shot firing cable, thereby preventing stray currents of electricity traveling through said cable and causing premature firing of the shot.

Another object is to provide a coupler which will facilitate the connecting and disconnecting of a cable to a source of power.

It is now the practice in firing shots in a mine for the shot firer to lay his cable, which is 100 feet or so in length, along the mine entry where the shot is located. He then attaches the cable to the shot and goes back to the other end of the cable and attaches the cable to a magneto or battery, either of which may be used to supply the electric current for firing the shot.

When the cable is laid on the mine floor while it is being connected to the shots, it is possible for the ends of the cable, or other parts of the cable on which the insulation has been broken, to come into contact with the ground, track rails or pipe lines and thereby pick up stray currents from the trolley system or other source and thereby cause a premature explosion of the shot.

By the use of the present coupler any danger of a premature explosion from the above causes is entirely eliminated since the coupler short-circuits the wires of the cable and forms a path for any stray currents picked up which is of less resistance than the spark gap path through the shot.

In the drawings—

Figure 1 is a side elevation showing the coupler in position on a shot firing magneto.

Figure 2 is a similar view showing the coupler in section.

Figure 3 is a transverse section, through the coupler, showing the plug in normal position.

Figure 4 is a similar view showing the plug in shot firing position.

Referring more particularly to the drawings, the letter A designates a shot firing magneto of usual and well known design, having the terminal posts 2 and 3 for connection with the shot firing cable 4. The terminals 2 and 3 are of slightly modified design from the standard posts used on magnetoes of this class, in that they are cut away intermediate their ends on their inside faces or opposite each other so as to form recesses 5 terminating at their lower ends in square or flat shoulders 6, and at their upper ends in overhanging heads or projecting contact faces 7.

A connector or coupler designated generally by the letter B, is provided for connecting the shot firing cable 4 to the magneto A. The coupler B comprises a casing member 8 having an open upper end and having its lower end closed by a wall 9 provided with openings or apertures 10 through which two terminal posts 2 and 3 project into the interior of the coupler. The lower wall 9 has a thickness substantially equal to the distance from the base of the posts 2 and 3 to the shoulders 6 so as to form a bearing support for a plug member C to be described.

The plug member C of the coupler comprises a head portion 12 and a reduced stem or shank portion 13. The plug is provided with a centrally arranged bore 14 in its head which intersects two bores 15 which extend upwardly from opposite sides of the stem 13. The cable 4 is entered through the bore 14 and its separate wires or conductors 16 are extended through the bores 15 and attached to contact elements 18 mounted in recesses 19 formed in the plug. The contact elements 18 are formed from spring or resilient metal and have contact fingers 20 which extend horizontally in a groove 21 formed around the plug.

The fingers 20 are cam-shaped, their free ends projecting outwardly a greater distance than the remainder thereof and underlying and in contact normally with a tab or lug 22 on the other contact element, so as to normally establish a short circuit of the cable 4 through the contact elements 18.

The base of the plug member is grooved or slotted vertically to permit the plug to be inserted over the terminal posts 2 and 3 so that the heads or contact faces 7 of the terminals may enter the recesses 19 of the plug.

The plug member C is adapted to be rotatably mounted in the casing 8 and to be held in place by a bolt 25. A coiled spring 26 is mounted around the bolt 25 and has one end secured to the base of the casing 8 and its other end secured to the plug C so that plug is normally held against rotation thereby and must be rotated against the tension of the spring 26.

The underside of the head 12 of the plug is cut away, as at 28, and a stop lug 29 is mounted in the upper end of the casing 8 so as to limit the movement of the plug C in both directions.

When the plug C is in normal position, that is, in position with the stop lug 29 against the left-hand end of the cut-away portion 28, the terminal posts 2 and 3 will be out of engagement with any part of the contact elements 18 and will remain out of contact until the plug C is rotated clockwise against the tension of the spring 26 at which time the cam-shaped fingers 20 of the contact elements 18 will engage the contact faces 7 of the terminal posts 2 and 3 and be sprung away from the lugs 22 of the opposite element 18, thereby breaking the short circuit and establishing a circuit from the terminal posts 2 and 3, through the elements 18 and cable 4. As soon as the operator releases the plug C the spring 26 will return the plug to normal position so as to re-establish the short circuit of the contact elements 18 so as to short-circuit the cable 4.

From the above it will be readily seen that if the magneto should be accidentally operated to create a current after the coupler is mounted on the terminal posts 2 and 3, no current will flow through the cable 4 since the posts are not in engagement with the contact elements 18. However, if, for any reason, the terminal posts should be in engagement with the contact elements when the magneto is operated, current would not flow through the cable 4, due to the short circuit through the elements 18.

It will also be understood that should the cable 4, due to any cause, pick up a stray electric current, such current will be shorted through the elements 18 and thus prevent the premature explosion of a shot.

While I have described the coupler of this invention as used with a shot firing magneto, it will be, of course, understood that it may also be used with a battery or other source of electric current and the claims are intended to cover all such uses.

I claim—

1. A safety coupler for connecting shot firing cables to a source of electric current, including two terminal members having overhanging contact faces, said coupler comprising a casing having openings to receive said terminals, a rotary plug mounted in said casing, a pair of cam-shaped spring contact members mounted on said plug, a shot firing cable connected to said contact members, a spring for normally holding said plug in position so that said contact members are out of engagement with the contact faces of the terminals, said spring contact members being normally in engagement with each other so as to form a short circuit, and said plug being adapted to be rotated relative to said casing and said terminals against the tension of said spring to force said cam-shaped contact members into contact with the overhanging contact faces of the terminals so as to break the short circuit engagement of said contact members and complete a circuit from the terminals through the shot firing cable.

2. A safety coupler for connecting shot firing cables to a source of electric current, including two terminal members, said coupler comprising a casing having openings to receive the terminals, a pair of movable contact members mounted on said plug and normally in engagement with each other so as to form a short circuit, a shot firing cable connected to said contact members, a spring for normally holding said plug in position so that said contact members are out of engagement with said terminals, and said plug being adapted to be rotated relative to said casing and said terminals against the tension of said spring to force said contact members into engagement with said terminals and away from each other so as to break the short circuit engagement of said contact members and complete a circuit from said terminals through said contact members and shot firing cable.

3. A safety coupler for connecting shot firing cables to a source of electric current including two terminal members, said coupler comprising a casing having openings to receive the terminals, a pair of movable contact members mounted on said plug and normally in engagement with each other so as to form a short circuit, a shot firing cable connected to said contact members, said plug being adapted to be rotated relative to said casing and said terminals to force said contact members into engagement with said terminals and away from each other so as to break the short circuit engagement of said contact members and complete a circuit from said terminals through said contact members and shot firing cable.

In testimony whereof, I have hereunto set my hand.

LADURA ALEXANDER BROWN.