The invention relates to an electrical apparatus designed particularly for use in blasting and has for its general object provision of a novel portable reel containing a battery and carrying a coil of wire and intended and adapted for use wherever it is necessary to set off a charge of explosive from a distance as is frequently necessary in mining and other operations.

An important object of the invention is to provide a device of this character which will be far superior to the ordinary method of using a length of wire which is simply coiled or uncoiled by hand as needed, it being well known that the ordinary method results in kinking the wire so that it lasts but a comparatively short time.

An important object of the invention is to provide a portable reel containing an electric battery and circuit closer means of such construction and arrangement that the circuit is normally broken so that it will be impossible to have an accidental discharge of a blasting cartridge or other explosive inasmuch as it requires a certain special definite act to close the circuit.

Another object of the invention is to provide a device of this character which is so constructed and arranged that an additional source of current may be plugged in if necessary or advisable in case the requirements of the particular job to be done should demand.

A further object is to provide a device of this character in which the essential operating parts are normally enclosed and will therefore be protected against derangement or accidental disturbance.

An additional object is to provide a device of this character which will be simple and inexpensive to make, easy to use, positive in action, efficient and durable in service, and a general improvement in the art.

To the attainment of the foregoing and other objects and advantages, the invention preferably consists in the details of construction and the arrangement and combination of parts to be hereinafter more fully described and claimed, and illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of the device with the cover plate shown open.

Figure 2 is a vertical longitudinal sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a detail elevation showing the circuit closer arrangement.

Figure 4 is an elevation of a cover disk of the circuit closer device.

Figure 5 is a diagrammatic view showing how auxiliary current may be plugged into the device and

Referring more particularly to the drawings, I have shown the device as comprising a casing 10 formed preferably of sheet metal and of any desired size and shape and painted, nickel plated or otherwise finished to have a neat and attractive appearance. As the device is intended to be portable the casing is shown as provided at its top with a suitable handle 11 so that it may be readily carried about from place to place wherever the use of the device is needed. Journaled through substantially the center of the casing is a drum 12 or reel including a central cylindrical hub member 13 of hollow formation and end flanges or disks 14. Actually, one disk 14 is shown as provided with a trunnion 15 journaled within a flanged opening 16 in the casing. At its other end the cylindrical hub 13 projects beyond the casing through a flange 17 surrounding an appropriate opening therein and is provided with an extension 18 carrying a crank handle 19 for rotating purposes. The second mentioned end of the hub 13 projects outwardly beyond the casing 10 and beyond the flanges 17 above referred to and contains a circuit closer mechanism to be described. Furthermore, this projecting end is provided with a cover plate 20 pivoted at 21 and provided with a handle 22 for operating purposes so that it may be swung into or out of its closing relation to the end of the drum or hub portion thereof.

As mentioned above, the hub member 13 is of cylindrical form and hollow and consequently serves as a convenient enclosure for a dry cell or electric battery 23 which has its central terminal 24 projecting through a disk 25 of insulating material located within the hub. Furthermore, this battery or dry cell has the customary outside terminal 26 extending through the same disk. The disk 25 carries a pair of terminals or binding posts 27 and 28 to which are connected the conductors 29 and 30 of a cable 31 which is wound about the drum or hub portion 13 of the drum and which is of course adapted to be connected with a blasting cartridge or anything else to be operated, set off or the like. Naturally, the casing 10 must be provided at some suitable point with an opening for the passage of this conductor or cable.

Pivoted upon the terminal post 27 is a metallic contact arm 32 having an extension 33 adapt-
ed, when so desired, to be brought into contact with the central contact 24 of the battery or cell 23. Connected with this contact is a coiled spring 34 which normally operates to hold the terminal 24. Furthermore, this contact member or arm is provided with a projection or lug 35 which constitutes a finger hold so that the arm may be swung to bring the extension 33 into engagement with the terminal post 24 when such is desired. In addition to the coil spring 34 there is also provided a leaf spring 36 which performs the same function. Pivoted upon the terminal post 28 to which the conductor 30 is attached is a contact arm 37 which is adapted to be brought into engagement with the terminal 26 of the battery and which is formed with a finger hold or lug 38. A coil spring 39 connects with the contact 37 and a leaf spring 40 is also engaged therewith for normally maintaining the contact 37 out of engagement with the terminal 26. Springs 32a and 32b are mounted on the disk 25 by means of screws 32a and 32b and are engageable by the arms 32 and 37, respectively, for limiting movement thereof under the influence of the springs.

The disk 25 is covered by another disk 41 of insulating material held in place by any suitable means and which is formed with an opening 42 for the passage of the lugs or finger holes 35 and 38, the disk 41 being normally covered by the plate 20 above referred to. At the edge of the opening 42 are notches 49 and 50 for a purpose to be described.

In the operation of the device thus far described, it will be apparent that the cable 31 may be grasped and pulled out from the casing 10 and attached to the blasting cap or anything else to be operated, after which the operator, by grasping the device by the handle 11 may retreat to a safe distance whereupon it is intended that he grasp the finger holds 35 and 38 and press them toward each other against the resistance of the springs 34 and 39 so as to bring the extension 33 on the contact 24 into engagement with the terminal 24 of the battery or cell 23, and the end of the contact 37 into engagement with the side terminal 26 of the battery or cell. When this is done it is quite clear that the circuit will be closed through the blasting cap or whatever else is to be electrically operated. It is consequently apparent that when the device is first attached the circuit is bound to be broken so that there will be no danger whatsoever to the operator inasmuch as it requires a positive action on his part to close the circuit.

In some instances it may be desirable to use a heavier current from that provided by the dry cell 23. In such event it is to be understood that some external source of current such as a storage battery or a group of dry cells or the like, indicated at 43 might be used, there being two conductors 44 and 45 adapted to be connected with the auxiliary source of current and formed into a cable 46 with terminals 47 and 48 respectively which, after the arms 32 and 37 have been moved part way toward each other, may be inserted in the notches 49 and 50. Then when the arms are again released they will engage the plugs and hold them in the notches. The device is placed where desired and the cable 31 is connected with whatever is to be operated. When connection is made between the conductors 44 and 45 and the battery 43 current will be supplied for setting off a charge for accomplishing a similar desired result.

It will be noted that a particular advantage in the use of the device is that the cable 31, when not in use, is always wound evenly upon the drum and when in use is pulled off therefrom in a uniform manner so that when rewound it will not kink and cause either breakage of the wires or condensers or of wearing or chafing of the insulation. It is also apparent that the device may be used with extreme ease especially as it is light and readily portable. Moreover the work of attaching the conducting cable to the blasting cap, fuse or any other device to be operated will be greatly expedited and facilitated so that the work may be carried on much more easily, quickly and with less danger than would otherwise be the case. In view of the fact that kinking of the wire is avoided it should be apparent that the conducting cable will have a much longer life than would otherwise be the case. It is really thought that the construction, operation and advantages should be readily apparent to one skilled in the art without further explanation.

While I have shown and described a preferred embodiment of the invention, it should of course be understood that I reserve the right to make all such changes in the details of construction as well as in the arrangement and combination of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I claim:

1. In a device of the character described, a casing, a hollow drum rotatably mounted therein and provided with a turning handle, a conducting cable wound upon the drum, a battery located within the hollow drum, and a switch located at one end of the drum and interposed between the battery and the conducting cable and operable for closing the circuit through the latter.

2. A device of the character described, comprising a casing equipped with a handle for carrying purposes, a reel journaling one end, the casing and carrying a conducting cable, said reel having a hollow hub portion, a battery located within said hub portion, a crank means for turning the reel, and a circuit closer carried by the hub portion of the reel and connected with the cable and the battery and operable for closing a circuit through the cable.

3. A device of the character described, comprising a casing equipped with a carrying handle, a reel rotatably mounted within the casing and comprising a hollow cylindrical hub equipped with a handle, one end of said hub being closed and the other being open, a battery located within the hub and extending through the open end thereof, a supporting disk of insulating material mounted at the open end of the hub, pivoted contacts mounted upon said disk and movable to engage the respective terminals, and a conducting cable on the hub portion of the reel and connected with said contacts.

4. A device of the character described, comprising a casing equipped with a carrying handle, a reel rotatably mounted within the casing and including a hollow hub portion closed at one end and open at the other, a source of current mounted within said hub portion, a cable of conductors secured to and wrapped about said
hub portion, a disk of insulating material closing the open end of the hub portion, terminals for the source of current extending through said disk, and a pair of pivoted spring pressed contacts connected with the conductors mounted on said disk and movable to engage the terminals of the source of current for closing a circuit through the cable.

5. In a device of the character described, a casing equipped with a handle for carrying purposes, a reel journaled within the casing and having a handle located exteriorly thereof, a conducting cable secured to and wound about the hub portion of the reel, and spring pressed contacts connected with the cable mounted on said disk and movable into engagement with the terminals of the cell, finger grips on said contacts, a second disk covering the first disk and having an opening therein accommodating the finger grips on said contacts.

7. In a device of the character described, a casing, a hollow drum rotatably mounted therein and provided with a turning handle, a conducting cable wound upon the drum, a battery located within the drum, a switch located at one end of the drum and interposed between the battery and the conducting cable and operable for closing the circuit through the latter, and means for connecting an external source of current to the switch whereby the battery within the drum will be cut out.

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