Aug. 19, 1941. S. F. ANDRUS 2,253,315

FLASHLIGHT ATTACHMENT

Filed July 5, 1939 2 Sheets-Sheet 1

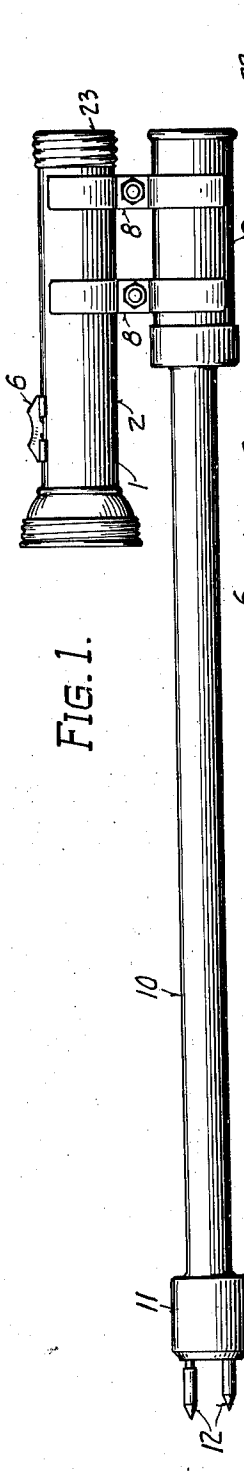


FIG. 1.

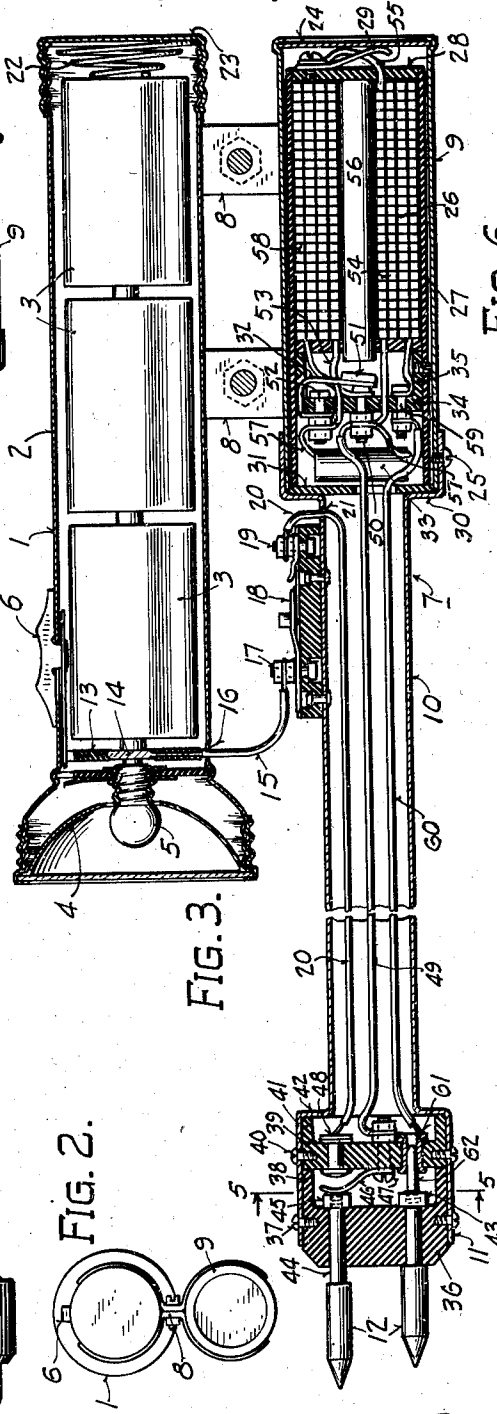


FIG. 3.

FIG. 2.

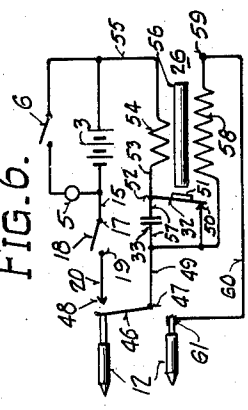


FIG. 6.

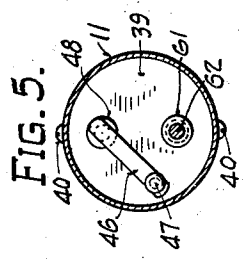


FIG. 5.

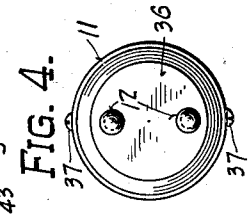


FIG. 4.

Sidney F. Andrus
INVENTOR.

BY Alvin A. Andrus
ATTORNEY.

Aug. 19, 1941. S. F. ANDRUS 2,253,315

FLASHLIGHT ATTACHMENT

Filed July 5, 1939 2 Sheets-Sheet 2

FIG. 7.

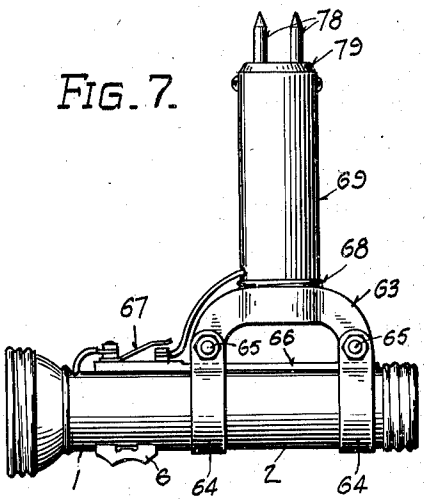


FIG. 8.

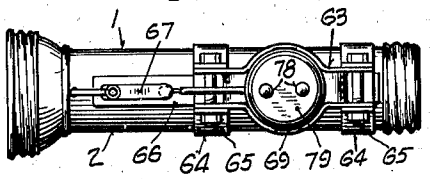


FIG. 9.

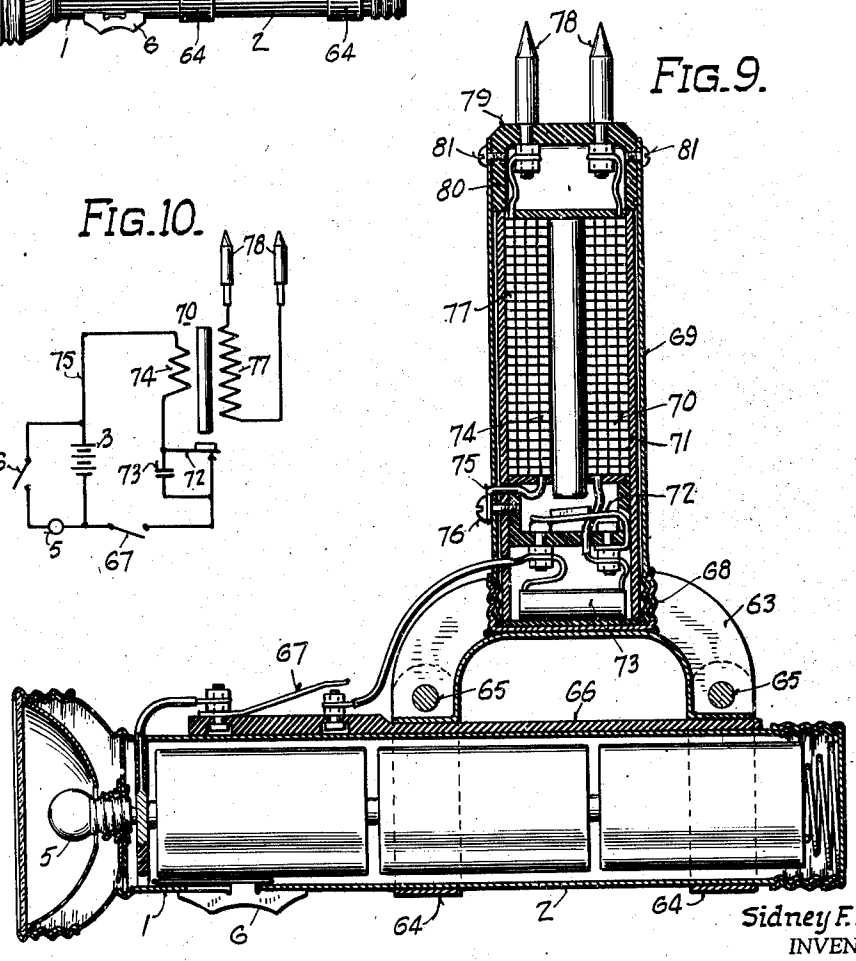


FIG. 10.

Sidney F. Andrus
INVENTOR.

BY Alvin C. Andrus
ATTORNEY.

Patented Aug. 19, 1941 2,253,315

UNITED STATES PATENT OFFICE

2,253,315

FLASHLIGHT ATTACHMENT

Sidney F. Andrus, Troy Center, Wis.

Application July 5, 1939, Serial No. 282,845

8 Claims. (Cl. 231—2)

This invention relates to a flashlight attachment.

The principal object of the invention is to provide an attachment for converting a flashlight at will into an electric prod, utilizing the batteries of the flashlight, for effectively safeguarding the holder against the acts of bulls and other animals.

Another object is to provide an electric prod as an attachment to a flashlight and at the same time preserve the functioning of the flashlight to light up the surrounding area.

Another object is to provide a simple and quickly applied device for use as an electric prod.

Other objects will appear hereinafter.

In accordance with the invention the attachment is adapted to be secured to the flashlight casing and has an induction coil for producing a high voltage shocking current from the relatively low voltage battery current, with prongs for delivering the shocking current to an object which comes into contact with the prongs.

A preferred embodiment of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a side elevation of the device attached to a flashlight;

Fig. 2 is a rear end view of the device;

Fig. 3 is a longitudinal section through the device and the flashlight illustrating the construction;

Fig. 4 is a front end view of the device;

Fig. 5 is a transverse section through the head of the device on the line 5—5 of Fig. 3;

Fig. 6 is a wiring diagram of the device illustrated in Figs. 1 to 5, inclusive;

Fig. 7 is a side elevation of a modified embodiment;

Fig. 8 is a top plan view of the device of Fig. 7;

Fig. 9 is a longitudinal section through the device of Fig. 7; and

Fig. 10 is the wiring diagram for the device of Figs. 7 to 9, inclusive.

The flashlight 1 employed may be of the usual two or three cell construction, having a cylindrical casing 2 containing the batteries 3 and a reflector 4 containing the usual light bulb 5. The hand switch 6 on the casing serves to close and open the flashlight circuit. Various detail constructions may be had depending upon the make of the flashlight, but it is a feature of the present invention that the attachment is applicable to most any standard flashlight.

The attachment has a casing 7 which is tubular and is secured to the flashlight casing 2 by means of metal clamps 8. The casing 7 preferably extends parallel to the flashlight, and has a main tubular body 9 of about the same diameter, a smaller tubular extension 10 from a foot to two feet long, and a head 11 of about the same diameter as the body and carrying the pointed prongs 12 which serve as the electrodes for shocking the object.

The attachment is electrically connected to the flashlight by means of an insulating disk 13 which is inserted between the end of battery 3 and the base of bulb 5. The disk 13 has a metal insert 14 at the center which serves to conduct the current from the battery to the bulb so as not to interfere with the use of the flashlight. A lead conductor 15 is secured to the insert 14 and extends radially in disk 13 and out through an opening 16 punched or drilled in the casing 2 of the flashlight.

The wire is secured to one terminal 17 of a switch 18 on tube 10, the other terminal 19 of the switch accommodating the lead wire 20 passing through an opening 21 into tube 10 and to the head 11. The switch 18 is preferably of the sliding contact type so that it will automatically stay in either open or closed position as it is manually operated.

The return connection to the flashlight battery 3 is by means of the casing 7 serving as a ground through clamps 8, casing 2 and the spiral contact spring 22 pressed against the rear end of the battery 3 by the usual threaded cap 23 of the flashlight.

The body 9 of the attachment comprises a metal tube having a rear closure plate 24 and secured at its forward end in the enlarged telescoping end of tube 10 by means of set screws 25.

The body 9 contains an induction coil 26 mounted in an insulating tubular casing 27 which fits snugly into the body. The casing 27 has an end plate 28 at the rear provided with a spring contact member 29 which engages the plate 24 and urges the casing 27 forward against the shoulder 30 of tube 10. The forward end of casing 27 may have a disk 31 pressing against the shoulder 30.

The forward end of casing 27 is provided with a space ahead of the coil 26 for accommodating a vibrator 32 and a condenser 33. The vibrator and condenser are separated by an insulating disk 34 secured to casing 27 and having a flange 35 serving to definitely space the same from coil 26. The disk 34 also carries a number of elec-

trical connections as will be described hereinafter.

The tube 10 serves to space the prongs 12 a suitable distance ahead of the operator and also contains the wire connections for energizing the prongs, these wires being slack in the tube so that the respective ends 9 and 11 may be removed from the enlarged ends of the tube without difficulty.

The head 11 comprises a plug 36 of heavy insulating material held in the enlarged forward end of the tube 10 by suitable set screws 37. The plug 36 has a circumferential skirt 38 engaging an insulating disk 39 held in place by set screws 40 and having a flange 41 engaging the shoulder 42 of tube 10.

The prongs 12 are mounted in the plug 36, one of the prongs being bolted through the plug and securely held to it by nut 43, and the other prong having a reduced shank 44 passing through the plug with a nut 45 on its end disposed to allow limited longitudinal movement of the prong in the plug. This movable prong is normally held in outwardly extended position by a spring contact member 46 secured by the binding post 47 to disk 39.

The electrical circuits and connections for the attachment are clearly illustrated in Figures 3 to 6, inclusive. The primary circuit starts with lead wire 20 entering tube 10 through opening 21 and passing forward to connect with a binding post terminal 48 in disk 39 and in line with the movable prong. The head of the terminal 48 is normally out of contact with the spring contact 46, but when the movable prong is pressed inwardly as by an object to be shocked, it presses the end of contact 46 into engagement with the terminal 48 thereby closing a switch formed by these parts and the primary circuit continues from terminal 48 through contact 46 to terminal 47.

A lead wire 49 connected to terminal 47 passes back through tube 10 to a central terminal 50 in disk 34. The vibrator 32 has a spring armature 51 normally engaging the head of terminal 50 and suitably secured to a binding post terminal 52 in disk 34. A primary lead 53 connects the terminal 52 to the primary winding 54 of coil 26. A return lead 55 at the other end of the coil connects the primary winding 54 with the contact member 29 which serves to provide the ground return as previously described to battery 3.

The closing of switch 18 and pressing of the prongs against an object closes the primary circuit above described and energizes the primary winding 54 of the coil 26. This causes the magnet core 56 of the coil to attract the armature 51 thereby separating the latter from terminal 50 and interrupting the primary circuit. This de-energizes the primary winding 54 allowing the armature 51 to return to normal position in contact with terminal 50 and again closing the primary circuit.

The operation of the device thereby effects a rapid vibrating of armature 51 and consequent rapid cycles of energizing and de-energizing of winding 54. The condenser 33 is connected across the terminals 50 and 52 by leads 57 to prevent sparking between armature 51 and the terminal 50 as the circuit is broken.

The coil 26 is further provided with a secondary winding 58 connected to terminal 50 and to a binding post 59 in disk 34. A wire 60 leads from post 59 through tube 10 to a terminal 61 in disk 39 in head 11. The terminal 61 is in line with the stationary prong and an extension 62 of the latter extends into an opening through terminal 61 and makes electrical contact with the terminal.

The secondary circuit of the attachment is as follows: from winding 58 to terminal 50 through wire 49 to terminal 47, through spring contact 46 to movable prong 12 and object to be shocked, back through the fixed prong 12 to terminal 61, wire 60 and terminal post 59 to the secondary winding 58.

The secondary winding 58 is of many turns of wire as compared to the primary winding 54 so that the voltage is stepped up from the normal battery voltage to a very high voltage preferably between 400 and 2000 volts for the shocking current.

Referring to the modified form illustrated in Figs. 7 to 10, inclusive, the attachment extends at right angles to the axis of the flashlight and is of simpler design, elminating the long tube between head and body and eliminating the movable prong switch in the primary circuit.

A channel base 63 is clamped by bands 64 and bolts 65 to the flashlight casing. An insert strip 66 of insulating material is secured to the flashlight beneath the base 63 and carries a trigger switch 67 for manual closing of the primary circuit.

The channel base 63 is preferably U-shaped as shown to allow the fingers of the operator to extend between it and the flashlight to firmly grip the latter. A threaded cap 68 is suitably secured in base 63 and is adapted to receive the inner end of the tubular body 69 of the attachment.

The induction coil 70 housed in the insulating casing 71 is similar to coil 26. The vibrator 72 and condenser 73 are in the lower end of casing 71. The ground connection for the primary winding 74 of coil 70 is by lead 75 and screw 76 in the outer metal casing 69.

The secondary winding 77 of the coil 70 has its leads directly connected to the fixed prongs 78 in plug 79 at the outer end of casing 69. The plug 79 does not need to be as thick as plug 36 since in this case both prongs are stationary. The plug 79 has a skirt 80 engaging the casing 71 of the coil to hold the latter against endwise displacement and set screws 81 hold the plug 79 in place.

The circuits of this construction are substantially the same as those of Fig. 6 with the exception that the switch provided by the movable prong is eliminated and the device operates whenever the operator presses the trigger switch 67 to closing position.

Various modifications may be provided within the spirit and scope of the invention as defined in the accompanying claims.

The invention is hereby claimed as follows:

1. In combination with a flashlight having a battery, a light bulb and circuit for energizing the latter from the former, an attachment comprising a casing detachably secured to the flashlight and containing an induction coil, means including a switch for connecting the primary winding of the coil to the flashlight battery without interfering with the flashlight circuit, means in said primary circuit of the coil for rapidly interrupting the primary circuit, and a pair of prongs providing terminals for the secondary winding of the induction coil and disposed to be pressed into contact with an object to be shocked.

2. In a unitary attachment adapted to be re-

movably secured to the outside of a flashlight, an induction coil having a vibratory armature and a primary and a secondary winding, means for connecting said primary winding to the terminals of the flashlight battery, means connecting said secondary winding to a pair of prongs constituting a prod disposed to apply a shock of high potential to an object coming in contact therewith, a normally open switch in said primary circuit, and means for closing said switch when an object presses against said prongs.

3. In a unitary attachment adapted to be removably secured to the outside of a flashlight, an induction coil having a vibratory armature and a primary and a secondary winding, means for connecting said primary winding to the terminals of the flashlight battery, means connecting said secondary winding to a pair of prongs constituting a prod disposed to apply a shock of high potential to an object coming in contact therewith and a switch in said primary circuit.

4. In combination with a flashlight having a tubular casing containing a battery and light bulb, a second tubular casing clamped to the first casing and containing a transformer coil having primary and secondary windings, means connecting the primary winding to the battery, a pair of prongs mounted on said second named casing and connected to the secondary winding for applying a shocking current to an object, and means for rapidly interrupting the primary current to produce a high potential current in the secondary.

5. In combination with a flashlight having a tubular casing containing a battery and light bulb, a second tubular casing clamped to the first casing and containing a transformer coil having primary and secondary windings, means connecting the primary winding to the battery, said second named casing extending parallel to the first named casing and having its forward end extending considerably beyond the forward end of the flashlight, a pair of prongs mounted on the forward end of said second named casing and connected to the secondary winding for applying a shocking current to an object, and means for rapidly interrupting the primary curret to produce a high potential current in the secondary.

6. In combination with a flashlight having a tubular casing containing a battery and light bulb, a second tubular casing clamped to the first casing and containing a transformer coil having primary and secondary windings, means connecting the primary winding to the battery, said second named casing extending at right angles to the axis of said first named casing, a pair of prongs mounted on the outer end of said second named casing and connected to the secondary winding for applying a shocking current to an object, and means for rapidly interrupting the primary current to produce a high potential current in the secondary.

7. In combination with an electric flashlight having a battery and a light bulb with the base of the latter engaging one terminal of the battery, an attachment fastened to the flashlight and having electrical connections with the battery thereof, said electrical connections comprising an insulating disk having a central metal insert disposed between the base of the bulb and the central terminal of the battery, a lead connected to said insert and passing out through an opening in the flashlight casing to the attachment, and a return ground connection through the flashlight casing to the other terminal of the battery.

8. In combination with an electric flashlight having a casing containing a battery and a light bulb with the base of the latter engaging the central terminal of the battery, an attachment comprising a casing fastened to the flashlight casing and providing prod terminals and means in said casing for applying a high potential current thereto from the flashlight battery, and electrical connections between said means and said battery comprising an insulating disk having a central metal insert disposed between the base of the bulb and the central terminal of the battery, a lead connected to said insert and passing out through an opening in the flashlight casing to said means in the attached casing, and a return ground connection through the two casings to the other terminal of the battery.

SIDNEY F. ANDRUS.