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DEACTIVATING SWITCH FOR ELECTRIC FENCES

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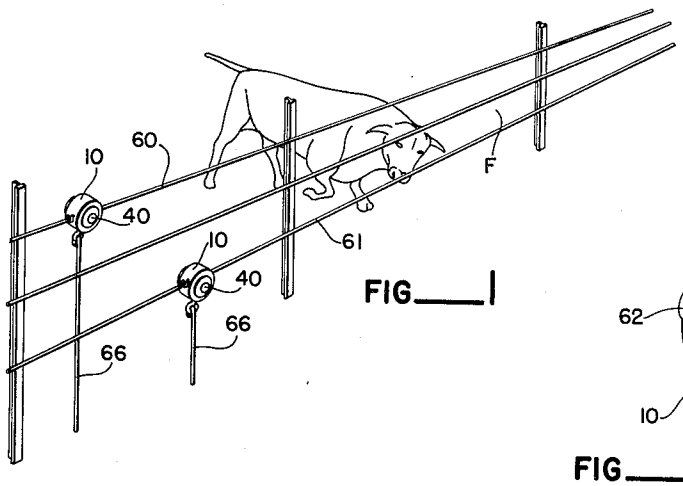


FIG. 1

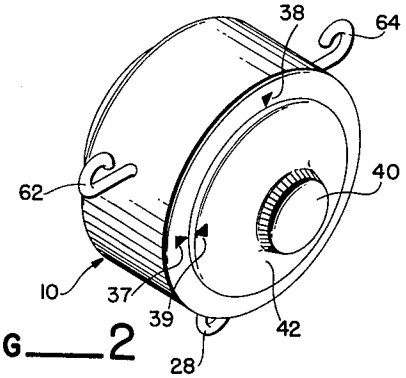


FIG. 2

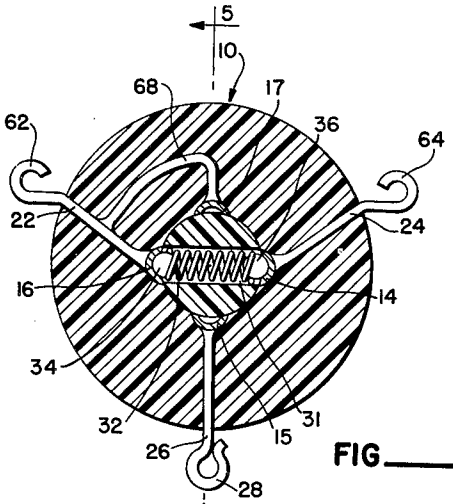


FIG. 4

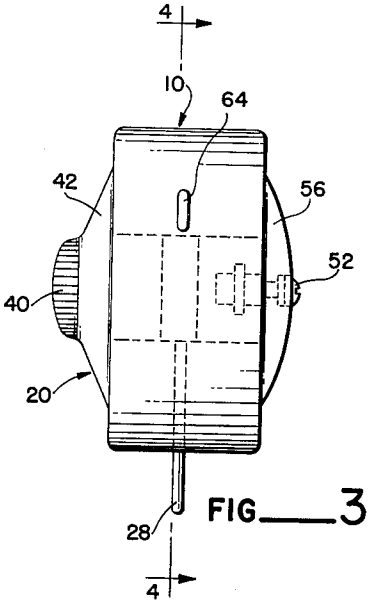


FIG. 3

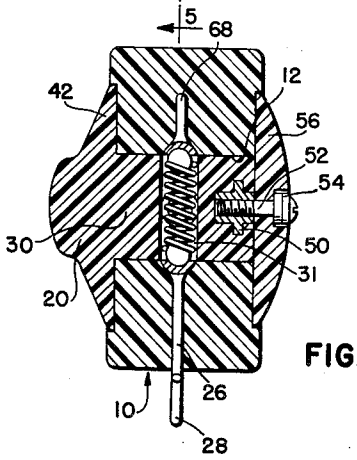


FIG. 5

RAYMOND R. MURRAY
INVENTOR.

BY Smith & Tuck

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DEACTIVATING SWITCH FOR ELECTRIC FENCES

Raymond R. Murray, Rte. 1, Box 67, Ferndale, Wash.

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This present invention relates to the general art of electric fences of the type where a high voltage, low amperage electric current is passed through the fence wires so as to give an electric shock of a safe order to animals confined thereby, but which has a current of sufficient intensity to discourage further contact with the wires by the animals. More particularly, this invention relates to a switch so constructed that it can be installed in an electric fence wire by the simple expedient of cutting the normal wire, bending back loops therein and having these loops engage hook ended conductors forming part of the switch. With such an arrangement, the switches can be placed at different points in a fence as conditions change with the seasons or with the livestock to be controlled by the fences.

In the past it has been necessary to have the de-activating switches in electric fence wires but these normally made use of conventional switch means which usually required additional shielding or a cabinet which entailed mounting, as on a fence post and then making what was in effect a permanent installation of the switch. Such an arrangement served its purpose for the one location. Users of electric fences, however, have found that there is an ever changing need for controlling fences which may be, for instance, the need of confining female animals during the period of expectancy of birth of their young or there may be many other reasons for wishing to change the electrical input for the fence. This often occurs through the change of seasons or change of crops in certain fields. My present de-activating switch is believed to be a fair solution of this problem.

The principal object of my invention therefore is to provide a de-activating switch for electric circuits which can be quickly installed in any charged wire circuit where there is a stretch of wire that is available in the open.

A further object of my present invention is to provide a de-activating switch that is so constructed that the tension members thereof will be actually stronger than the wire strand that is interrupted in the installation of the switch.

A further object of this invention is to provide a simple switch that is largely made of dielectric, molded material, the design of which is so simple that sufficient of the dielectric material can be employed to provide a wide margin of electrical security for the operators of the switch.

A further object of this invention is to provide as a built-in component of my switching means, a ground connection which is selectively available.

A further object of this invention is to provide a disconnector switch that will handle the high voltages imposed on electric fences by means so simple that the cost of the switch can be kept to a low enough level so that an adequate number can be used by a farmer to give him the desirable full control of his electric circuits.

Further objects, advantages and capabilities will be apparent from the description and disclosure in the drawings, or may be comprehended or are inherent in the device.

In the drawings:

FIGURE 1 is a perspective view illustrating a common use of my switch.

FIGURE 2 is a perspective view illustrating the general appearance of my switch.

FIGURE 3 is a side elevation of my switch.

FIGURE 4 is a vertical transverse sectional view taken along the line 4—4 of FIGURE 3.

FIGURE 5 is a vertical longitudinal sectional view taken along the line 5—5 of FIGURE 4.

Referring to the drawings throughout which like reference characters indicate like parts the numeral **10** designates the housing of my switch means. This is preferably made cylindrical to provide a pleasing appearance with the least amount of material employed. The material used in making the housing must be one of the dielectric plastic materials which has reasonable resistance to damage from being handled or occasionally being dropped. It further must have the ability to accept molded-in metal members and this places a basic requirement on the material that it be moldable, preferably in powdered form so that it can fully enclose the metal inserts and serve to hold them in position throughout the usable life of the device.

Housing **10** is provided with a through cylindrical bore **12** and further has molded in it a plurality of substantially semi-spherical contact members as **14**, **15**, **16** and **17**. These members should be considered as made by employing semi-spherical inserts and then having them relieved so that the margins of the contact members will form part of the internal bore **12** as it is necessary that metal extends out to the limits imposed by bore **12** and thus provide a metal protector for what would otherwise be a sharp edge of the molded material of housing **10**. Any such sharp edges soon become worn and broken off in use and find lodgement within the rotary members which may interfere with the electric contacts as well as adding greatly to the difficulty of turning the interior switching element **20**. A rigid contact conductor is secured to each of contacts **14**, **15**, **16** and **17**. To contacts **14** and **16** are secured the fence wire conductors **22** and **24**. These conductors should be of a weight that will give them strength in excess of the fence wires to which they are to be connected. It is further desirable that these conductors be made of tempered wire so that they will not be easily bent out of shape or damaged in handling. Each of the conductors **22** and **24** are provided with open hook portions at their ends so that looped fence wires can be engaged therein and this again calls for more than normal strength in the connecting conductors. Contact **15** is provided with a ground connector or bus **26** which similarly to **22** and **24** is provided with a hook **28** formed on the end of the ground bus **26**. Contact **17** is provided with a ground conductor which in the exemplary showing of FIGURE 4 makes an electrical connection with fence wire connector **22**.

The switching rotor **20** is provided with a cylindrical portion **30** of a diameter to provide a workable running fit with bore **12** of housing **10**. Within the cylindrical portion **30** is provided a transverse bore **31** adapted to provide a working housing and retaining means for the compression spring **32**. The ends of the spring **32** are formed as seats for the ball switch contactors **34** and **36**. These balls actually are the switching means and compression spring **32** in which they seat must be of material that will form an adequate electrical conductor between the switch ball contactors **34** and **36**. Another requirement is imposed upon spring **32** which is that it be of a temper that will insure the proper seating of balls **34** and **36** yet at the same time it must be conveniently possible to revolve rotor **20** in each switching operation. It is for this reason that the semi-spherical electric contact members **14**, **15**, **16** and **17** must be in effect somewhat less than half a sphere because, first, it is necessary to have sufficient spherical surface so that the balls will seat and positively position the rotor **20** and second, it must be conveniently possible to revolve the rotor in the switching operation.

An ideal proportioning is that in which the spring and the depth of the recess in the contact members is such that there will be an apparent reluctance for the ball to disengage from the spherical seat and tends to compress spring 32 as the rotor is turned to a point where there will be a snap release. This gives the desirable quick break of the current such as is achieved in most lighting switches by means of spring toggle arrangements. Indices 37 and 38 are provided in the housing 10 and a single index 39 on the rotor flange 42 to indicate the switch setting.

Rotor 20 is provided with a hand grip knob portion 40 and a flange portion 42. Flange 42 is a sealing means for bore 12 and preferably is provided with an annular recess a recess formed in housing 10 concentric with bore 12 as will be noted particularly in FIGURE 5. It is intended that housing 10 normally be molded of suitable plastic material and the added cost of this recessed arrangement is practically nil and is to be recommended.

At its opposite ends from flange 42 the cylindrical portion 30 of the rotor is preferably provided with a meal insert. illustrated at 50, to accommodate a pivot and securing screw 52. This screw preferably is provided with a plurality of washers 54 which are recessed into the retaining cover 56. With this arrangement it is contemplated that the retaining cover will remain stationary with housing 10 as rotor 20 is turned, with the rotary action being accepted by the washers 54. It is desirable that the retaining cover be somewhat recessed into housing 10 as is generally illustrated in FIGURE 5. In employing my de-activating switch means reference is made to FIGURE 1 in which switches are shown on the top and bottom wires of a wire fence. In installing this equipment it is only necessary for instance to cut the top wire 60 and the bottom wire 61 and turn the ends back to form loops which are engaged in loops 62 and 64 of conductors 22 and 24. This means a complete break in fence wires and brings out clearly why this whole switch unit must be ruggedly built so that it can accept the strain imposed on the wires, particularly if a large animal rests its weight on the wire, which is quite common with unprotected fences. There are various theories on the use of ground wires. Many political sub-divisions require them and they are therefore supplied with this unit, in which the ground bus 28 comes out of the lower portion of housing 10 and is provided with a suitable hook or spring loop 26 so that a satisfactory ground wire can be secured to it and then led to ground as is illustrated at 66. The switching connections will probably be best understood from a study of FIGURE 4 and in the showing the rotor is positioned to make electrical connection between the fence wire connectors 22 and 24, the current passing through the semi-spherical electric contact members 14 and 16 and through the compression spring 32. If the rotor is revolved 90 degrees, connection will be made from conductor 22 which can be accepted for this description as the hot wire and then led through ground connector 68 to contact 17, then through the rotor ball spring assembly 32 out the ground bus 28 to a ground wire as 66. It will be believed apparent that if no ground wire is used the switch becomes a complete disconnect switch.

It is believed that it will be clearly apparent from the above description and the disclosure in the drawings that the invention comprehends a novel construction of de-activating switch for electric fences.

Having thus disclosed the invention, I claim:

1. A switch for use on electric fences, comprising: a dielectric housing having a centrally disposed bore and an annular recess concentric with said bore; a switching rotor having a cylindrical portion revolvably disposed within said bore and a flange secured to one end thereof providing a sealing means in association with said annular recess of one face of said housing; a retaining cover revolvably secured to one end of said rotor and adapted to position it within said housing and coact with the annular recess of the other face of said housing to position and seal said rotor; a plurality of pairs of diametrically disposed contact members each having an electrical conductor secured thereto molded into said housing with the contact members facing on the surface of said bore; a transversely disposed bore passing through the cylindrical portion of said rotor; a compression spring selectively serving as an electric current conductor disposed in said transversely disposed bore and having a ball receiving seat on each end thereof; a ball contactor disposed at each end of said spring and adapted to coact with the electrical contacts of said housing to provide an electrical switching means.

2. The subject matter of claim 1 in which two contacts disposed on opposite sides of said housing have conductors passing substantially radially through said housing and terminating in external hooks adapted to be engaged by the ends of a fence wire which is cut to permit the inclusion of said switch as a tension member in the wire.

3. The subject matter of claim 2 in which one of the medially disposed contacts is connected by an electric by-pass conductor to one of said contacts and a second medial contact is provided with an electric bus passing substantially radially through said housing and terminating in a loop connector adapted to be secured to a grounded conductor.

4. The subject matter of claim 1 in which said contacts are concave in substantially semi-spherical form and adapted to snugly engage said ball contactors to make electrical connections therewith.

5. The subject matter of claim 4 in which the rotation of said rotor first compresses said compression spring in the act of breaking an electric contact and gives a delayed release which finally makes a quick break of the current and then prevents arcing.

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