AUTOMATIC ELECTRIC SWITCH FOR CABLE-CARRYING DRUMS.


To all whom it may concern:

Be it known that I, Charles F. Cuno, a citizen of the United States of America, residing at Meriden, Connecticut, have invented a new and useful Automatic Electric Switch for Cable-Carrying Drums, of which the following is a specification.

My invention relates to an automatic winding device or drum upon which may be mounted an electric cable carrying at its outer end some form of current consuming device such as a cigar lighter, so-called, or a lamp, the construction being such that when the cable is fully wound on the drum the current through said cable will be cut off, or the cable unwound by the pulling out of the cable, said current will be turned on, or vice versa, depending upon the desired conditions.

In the drawings:

Figure 1 is a side elevation somewhat diagrammatic in character illustrating such parts as are essential to an understanding of my invention, the drum and drum casing being shown slightly in perspective, one side of the casing being taken off.

Fig. 2 is a similar view of the drum and casing slightly modified.

Fig. 3 is a view similar to Fig. 2 showing another modification.

Fig. 4 is an edge view partly in section of the parts shown in Fig. 3.

Fig. 5 is a view similar to Figs. 2 and 3 showing another modification.

Fig. 6 is a plan view of certain parts shown in Fig. 5, said view being fragmentary and partly in section.

Fig. 7 is a view similar to Fig. 2, but showing another modification.

Fig. 8 is an edge view of the winding drum showing cable connections.

1 represents conventionally a current consuming device, for example, a cigar lighter or a lamp. 2 and 2 are the two side flanges of a drum which are insulated from each other. This drum is rotatable in a suitable housing 3 which is preferably open only at the front. Leading from the drum out to the current consuming device 1 is a cable 4 of current conducting wires. One of these wires is in electrical connection with one side flange 2, while the other is in electrical connection with the side flange 2. The flange 2 carries a pinion gear 6 which meshes with a large gear 7 suitably mounted in the housing. Bearing against the gear 7 is a brush 8. This brush 8 is carried by but insulated from the housing 3. The brush 8 has a connector 9 leading to a battery 10 or other source of electrical energy. Leading from the battery 10 to the housing 3 is a connector 11. 12 is a brush carried by the housing 3 and bearing on the side flange 2, so that the flange 2 is always in electrical connection with one side of the battery 10.

The other flange 2 is insulated from the housing at all times. In this particular instance, the shaft 5 may be mounted in an insulating bushing in the adjacent side of the housing, such a bushing being indicated at 13, Fig. 4. The gear 7 is also insulated from the housing although carried thereby. 15 represents a bushing of insulating material for the shaft of the gear 7.

From the foregoing it will be seen that the battery 10 is electrically connected on one side with the flange 2 and on the other side it is connected with the flange 2 through the medium of the gearing 7 and 6. To interrupt the circuit, I provide an insulating piece 14 on the gear 7 in the path of the brush 8. In the particular construction shown, when the cable 4 is fully wound on the drum and the current consuming device 1 is in its home or idle position, this insulating piece 14 will stand under the brush 8 and hence the circuit will be broken. When, however, the device has been pulled out and the drum has been turned to a sufficient degree, the insulating piece 14 will move away from the brush 8 allowing the latter to make an electrical connection with a current carrying portion of the gear 7 and associated parts, thus closing the circuit. The degree to which the cable 4 must be drawn out to close the circuit, is predetermined by the length and position of the insulating piece 14, and this, of course, may be varied at will. The drum may be of the self-winding type equipped with the usual self-winding spring, not shown, but well understood, an example of the same being shown in my former Patent No. 1,208,504 dated Dec. 12, 1916, to which reference may be had for a detailed showing of the drum construction with the two side flanges thereof insulated from each other.

By this arrangement, the current will not accidentally remain on if the drum does not fully rewind the cable, and hence, if the user does not happen to take the pains to see that the consuming device 1 is completely restored to its home position after
said current consuming device has been used, there will be no current loss because even in such an event the cable may be sufficiently rewound to break the circuit.

I have shown herein several modifications of mechanisms which will operate in the same fashion as the mechanism shown in Fig. 1, and I will describe briefly and without unnecessary reference to the features of construction which may be in common to Fig. 1.

In Fig. 2 instead of providing a wheel to mesh with the gear 6 in the form shown in Fig. 1, I have shown a toothed rack 7, the teeth of which mesh with the gear 6 so that the said bar acts as a circuit closer and opener. In this case, the insulating piece 14a functions as the insulating piece 14 in Fig. 1.

In Figs. 3 and 4 I have formed the side flange 2b which corresponds to the flange 2, but in such a manner that its edge operates as a small gear meshing with the small gear 16 which is suitably insulated from the housing and which carries on its face an insulating piece 14b (see Fig. 4) which breaks the contact through the brush 8a which in turn is in electrical connection with the battery through the wire 9. Obviously, as the drum revolves, the small gear 16 will be revolved to make and break the circuit.

In Figs. 5 and 6 the side flange 2c corresponds to the side flange 2b shown in Fig. 1. In this instance, the flange is provided at 17 with a tooth which will engage a toothed wheel 18 carried by the housing but insulated therefrom, said tooth 17 advancing the wheel 18 one step in each revolution of the drum. The wheel 18 has the usual insulating piece 14c for coaction with the brush 8c so that the circuit will be opened and closed by the rotation of the drum.

In Fig. 7 I have shown a further modification in which the gear 6c has only one tooth, the same being arranged to move the gear 19 one step at a time with each revolution of the drum. The gear 19 carries the insulating piece 14d for the same purpose as before described.

There may be other forms of gear connection by which the same result may be accomplished, but I have shown enough herein to indicate the scope of my invention and the objects to be attained thereby.

What I claim is:

1. An automatic switch for drum wound current consuming devices comprising a housing, a drum carried thereby and including two spaced current carrying flanges insulated from each other, an electric cable including two conductors connected to said flanges respectively and arranged to be wound on said drum, a switch for controlling the current to one of said flanges, said switch comprising a movable element mounted on said housing and geared to said drum, a spring contact bearing against said movable element, said movable element having a portion thereof insulated in the path of said spring contact whereby when said insulated portion engages said spring contact the current to said flange will be broken.

2. An automatic switch for drum wound current consuming devices comprising a housing, a drum carried thereby and including two spaced current carrying flanges insulated from each other, an electric cable including two conductors connected to said flanges respectively and arranged to be wound on said drum, a switch for controlling the current to one of said flanges, said switch comprising a movable element mounted on said housing and geared to said drum, a spring contact bearing against said movable element, said movable element having a portion thereof insulated in the path of said spring contact whereby when said insulated portion engages said spring contact the current to said flange will be broken, said insulated portion being in position to break the circuit when nearly all the cable is wound on the drum.

3. An automatic switch for drum wound current consuming devices comprising a housing, a drum carried thereby and including two spaced current carrying flanges insulated from each other, an electric cable including two conductors connected to said flanges respectively and arranged to be wound on said drum, a switch for controlling the current to one of said flanges, said switch comprising a movable element mounted on said housing and geared to said drum, a spring contact bearing against said movable element, said movable element having a portion thereof insulated in the path of said spring contact whereby when said insulated portion engages said spring contact the current to said flange will be broken, said insulated portion being in position to break the circuit when nearly all the cable is wound on the drum, and continuing to break said circuit until a predetermined length of said cable has been unwound from said drum.

4. An automatic switch for drum wound current consuming devices, comprising a drum including two current carrying means insulated from each other, an electric cable including two conductors connected to said current carrying means respectively and arranged to be wound on said drum, a switch proper comprising a movable element mounted independently of the drum but geared to said drum, and a spring contact bearing against said movable element, said movable element having a portion thereof insulated in the path of said spring con-
tact, whereby when said insulated portion engages said spring contact the circuit will be broken.

5. An automatic switch for a drum wound current consuming device, including a drum, a current carrying cord wound thereon, a movable member geared to the drum to be rotated thereby and having a conducting portion and a non-conducting portion, and a contact brush supported independently of the drum and arranged to contact with both the conducting and the non-conducting portions of said movable member depending upon the position of the latter.

CHARLES F. CUNO.