Feb. 14, 1928. 1,659,293

W. HERMANN

ELECTRICAL DEVICE

Filed Jan. 5, 1924 2 Sheets-Sheet 1

Fig. 1.

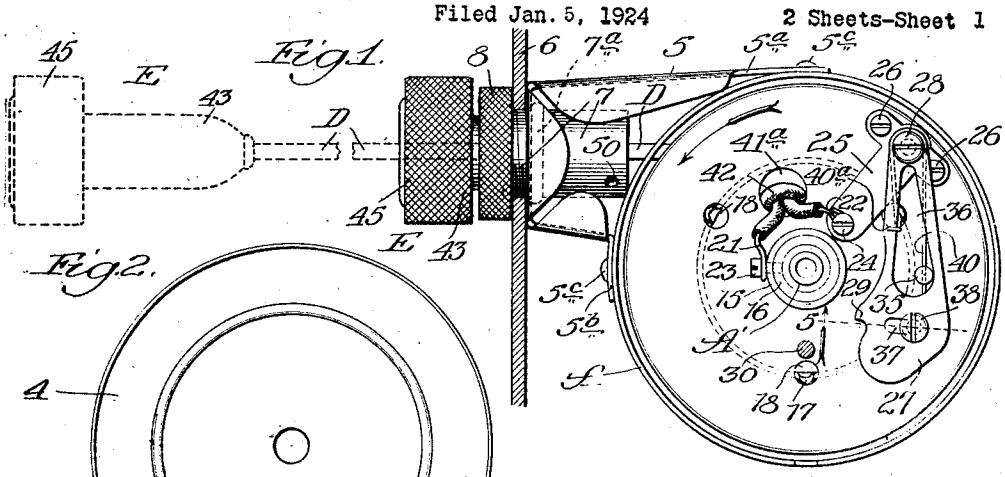


Fig. 2.

Fig. 3.

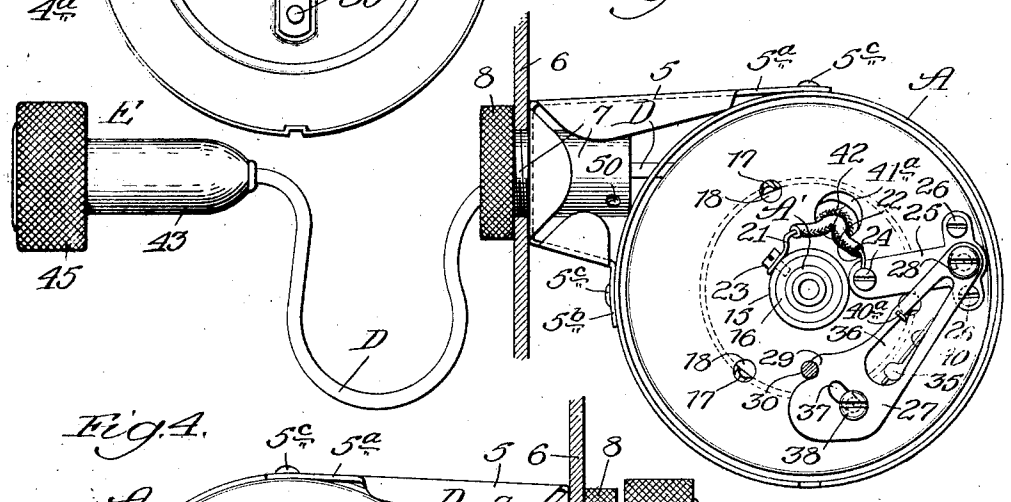


Fig. 4.

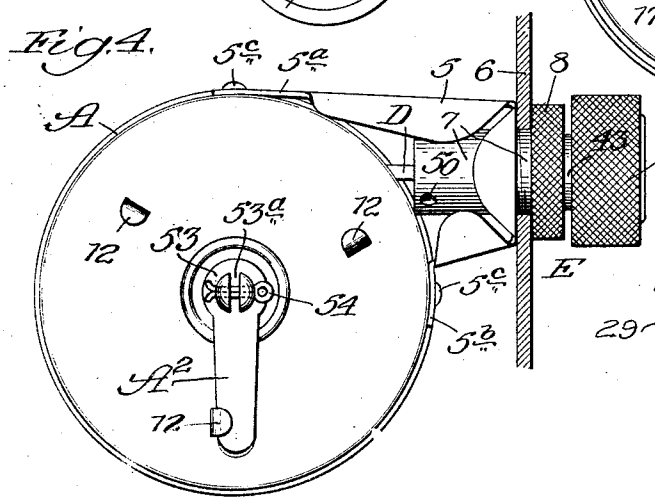
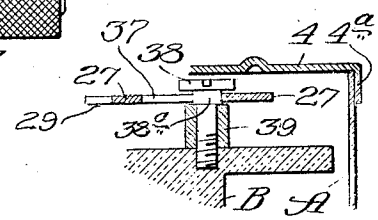


Fig. 5.



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Fig. 6.

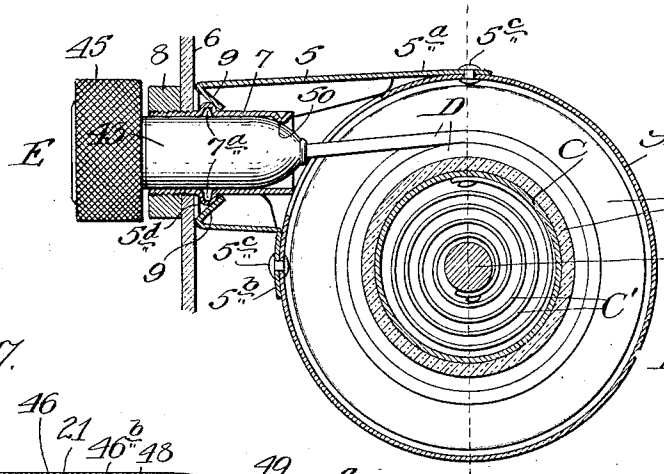


Fig. 7.

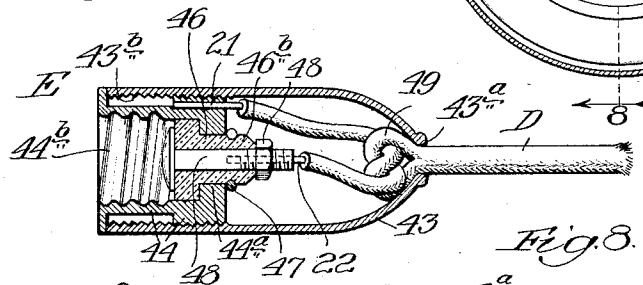


Fig. 10.

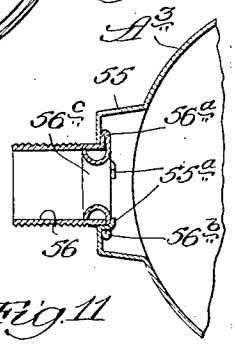


Fig. 8.

Fig. 9.

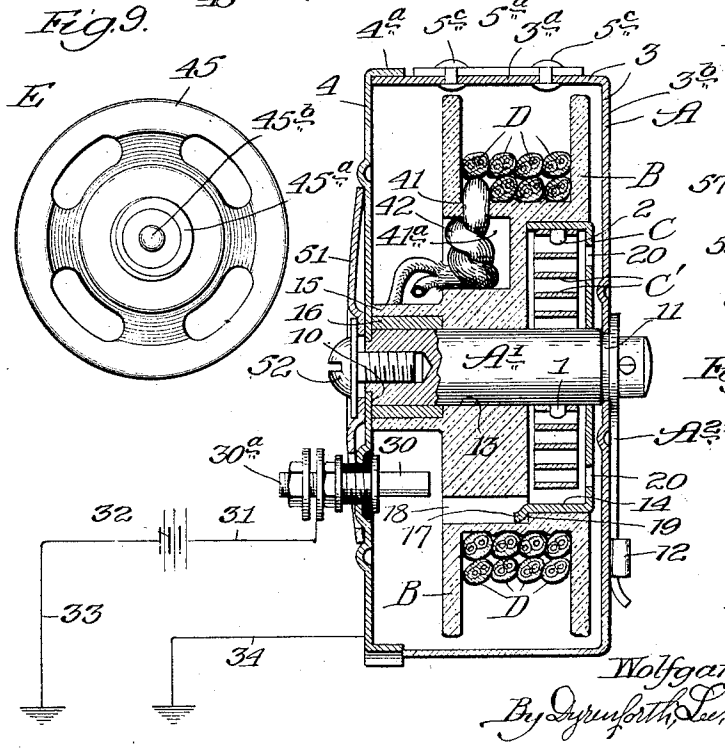


Fig. 11.

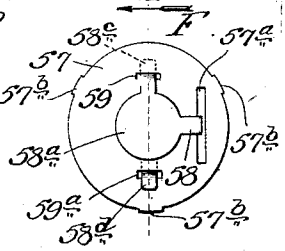
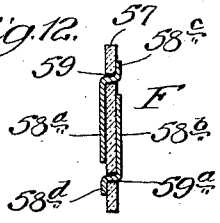


Fig. 12.



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Patented Feb. 14, 1928. 1,659,293

UNITED STATES PATENT OFFICE.

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ELECTRICAL DEVICE.

Application filed January 5, 1924. Serial No. 684,676.

This invention relates particularly to electric igniters of the type employing a spring actuated drum and a cable which winds on said drum, the cable being equipped at one end with an igniter and being capable of turning the drum against the force of its spring as the cable is drawn from the drum.

The primary object of the invention is to provide an igniter of this type which is of improved construction and which is capable of automatically latching the drum in any desired position, so that while the igniter is being employed for lighting purposes, the cable or cord need not be kept taut.

Other objects of the invention will appear from the detailed description hereinafter given. It may be stated here, however, that in the preferred construction of the invention, which is illustrated in the accompanying drawings, the drum latching device serves also the purpose of a commutator. This enables a simple and staunch device, which is thoroughly effective for its purpose, to be produced at a very moderate cost.

In the drawings, Fig. 1 represents a side elevational view of the improved device with the cap-section of the casing or frame removed, the device being applied to a metal dash which is shown brokenly in section; Fig. 2 an inner face view of the cap-section; Fig. 3, a view similar to Fig. 1, but showing the igniter tip withdrawn somewhat and the drum latched in the circuit-closing position; Fig. 4, a side elevational view of the device, viewed from the opposite side; Fig. 5, a broken sectional view taken as indicated at line 5 of Fig. 1; Fig. 6, a sectional view parallel with one side of the casing; Fig. 7, a sectional view of the handle portion of the igniter; Fig. 8, a sectional view taken as indicated at line 8 of Fig. 6; Fig. 9, a rear view of the igniter-tip; Fig. 10, a broken vertical sectional view showing a modification of the means for supporting the casing; Fig. 11, a face view of a fuse-disk adapted to be employed in the socket which receives the shank of the ignition-tip; and Fig. 12, a sectional view taken at line 12 of Fig. 11.

In the construction illustrated, A represents a frame comprising a casing A and a shaft A′, the shaft being angularly adjustable with reference to the casing by means of a handle A^2; B, a drum which preferably is of insulating material and which is journaled on the shaft A′; C, a spring-housing which contains a spring C′ whose inner end is secured to the shaft A′ at the point 1 and whose outer end is secured to the inner circumferential surface of the spring-housing C at the point 2; D, an electric cable, or cord, which winds upon the drum B and which serves as a medium for turning the drum against the force of its spring when the igniter is withdrawn from its socket; and E, an igniter attached to the outer end of the cable D.

The frame may be of any suitable construction. The casing A preferably comprises a main section 3 and a cap-section 4. The section 3 preferably is drawn from sheet metal into cup form and affords a circumferential wall 3^a and a bottom wall 3^b which serves as one side of the casing. The cap 4 serves as the other side of the casing and has a short circumferential flange 4^a which fits over one edge of the wide circumferential flange 4^a which fits over one edge of the wide circumferential flange 3^a of the main casing-section.

A bracket 5, which may be formed from sheet metal, has arms 5^a and 5^b embracing a sector of the circumferential wall 3^a of the casing, said arms being secured to said wall by rivets 5^c.

The bracket 5 is provided with a vertical wall 5^d which bears against one surface of the metal dash 6. The dash is provided with a perforation through which extends a sleeve 7 which is provided at an intermediate point with a bead, or flange 7^a. The front end of the sleeve is threaded and extends freely thru a perforation in the vertical member 5^d and through the perforation in the dash 6, the front extremity of the threaded sleeve being equipped with a nut 8, by means of which the device is clamped to the dash. The vertical wall 5^d of the bracket has extending rearwardly therefrom at points surrounding the perforation in said wall, clenching lugs 9, which are clenched back of the bead 7^a, so that the sleeve 7 is firmly secured in the bracket 5.

The shaft A′ has reduced portions 10 and 11 near its ends, which are journaled in the side walls of the casing, the shoulders adjacent to said reduced portions bearing against the inner surfaces of said walls. The shaft may be turned by means of the handle A^2 to adjust the tension of the spring C′. As

shown in Fig. 4, one of the side walls of the casing is provided with stops 12, formed by punching portions of the metal outwardly. These stops are in the nature of ratchet projections. The handle A^2 may be turned in one direction to ride over said projections, and when the spring is of the desired tension, the handle may be latched under one of the projections, as shown in Fig. 4. If it be desired to relieve the tension of the spring, this can be accomplished by springing the handle outwardly to permit the shaft to turn in the reverse direction.

The drum, or reel, B, preferably is formed of insulating material. It may be formed conveniently by moulding a suitable insulating compound into the desired form. The drum is provided with a central bore 13 which is journaled on the shaft A'. In one side of the drum is formed an enlarged central cavity 14 which serves as a chamber for the spring-housing C. At the other side of the drum is a hub, or annular extension 15, within which is fitted a metal sleeve 16. The sleeve 16 rotates with the drum and makes electrical contact with the shaft. The shaft, in turn, is in electrical contact with the casing.

The spring-housing C is preferably in the form of a comparatively small sheet metal cup whose bottom wall is perforated and journaled on the shaft. As previously explained, the spring has its inner end secured to the shaft at point 1 and has its outer end secured to the flange or circumferential wall of the spring-housing at point 2. The spring-housing is inserted in the chamber 14 in such manner that the edge of the circumferential wall bears against the inner lateral wall of the chamber 14 with which the drum is provided. The edge of the flange of the housing C is equipped with clenching lugs 17 which extend into perforations 18 with which the drum is provided. The perforations 18 intersect the chamber 14 only partially. That is, the perforations 18 are partially offset with relation to the plane of the circumferential wall of the chamber 14, so that shoulders 19 are provided, against which the lugs 17 are clenched. Thus, the spring housing C is firmly anchored within the chamber provided for it in the drum, so that the spring-housing and the drum must turn together on the shaft A'. Nevertheless, the spring-housing may be forcibly removed from its chamber if desired. To facilitate removal, the lateral wall of the spring-housing may be provided with perforations 20 to enable an instrument to be applied to effect the withdrawal of the housing from its chamber.

The cable, or cord D, comprises two insulated conductors 21 and 22. The inner end of one of these conductors is connected electrically with the metal sleeve or tubular metal insert 16, with which the drum is provided. Thus, as shown in Fig. 1, the conductor 21 is connected with the insert sleeve 16 by means of a short screw 23 which extends through a perforation in the insulation sleeve 15 and screws into a tapped perforation in the sleeve 16.

The inner end of the conductor 22 is secured by a screw 24 to a small metal plate 25, which is mounted on the drum. The plate 25 is in the form of a T-shaped strip which is secured to the drum by the screw 24 and by additional screws 26.

A centrifugal latching-pawl 27 is pivoted on a screw 28 mounted on the conductor-strip 25. The pawl, or latching member 27, is provided near its free end with a latching tooth 29, which is adapted to engage a fixed contact-stud 30, which is insulatingly mounted on the cap 4 of the casing. The outer end of the contact-stud 30 serves as a binding post 30^a. In practice, one conductor 31 from an electrical source 32, is connected with the binding post. The other conductor 33 leading from the electric source is grounded, and the frame or casing of the cigar lighter is likewise grounded by the manner of mounting it on the metal dash of the automobile. In Fig. 8, the electrical connections are indicated diagrammatically, the grounding of the casing A being indicated by the conductor 34.

From the description thus far given, it will be understood that the conductors in the cable D are energized when the latching tooth 29 of the pawl 27 engages the contact-stud 30.

The full line position shown in Fig. 1 corresponds with the position shown in Fig. 6. In this position, the handle of the cigar lighter is in its socket and the cord is drawn taut, thus preventing the drum from being rotated further by its actuating spring. In this position, the pawl 27 is out of engagement with the contact-stud 30. In other words, the electric circuit is broken when the cigar lighter is in its socket. In Fig. 3, the cord is shown drawn out partially, and the pawl has been allowed to engage the contact-stud 30, in which position the circuit is closed.

The pawl 27 which preferably has its pivot 28 disposed near the largest circumference of the drum, is capable of swinging freely upon its pivot. The pawl is limited in its vibrations by a non-metallic stud 35 which is carried by the drum, and projects from one side thereof. This stud 35 extends into an enlarged slot or recess 36 with which the pawl is provided. The free end portion of the pawl 27 is provided with an arcuate slot 37 which engages a guide-stud 38 in the manner shown in detail in Fig. 5. The construction is such as to permit free oscillation of the latching-pawl 27. The stud 38

is in the form of a screw which is secured to the drum B. Interposed between the pawl and the drum is a short sleeve 39 which preferably is of non-metallic material. The screw 38 has a shoulder which bears against the outer end of the sleeve 39 and has a guide portion 38[a] which engages the arcuate slot 37. The construction is such as to prevent gripping of the pawl 27.

It is preferred to employ in connection with the pawl 27, a light spring 40 which serves to positively draw the free end of the pawl inwardly, that is, to the position illustrated in Fig. 1, so that engagement of the tooth 29 with the contact stud 30 will always occur at appropriate times. The spring 40 has its intermediate portion coiled about the pivot screw 28 and has a long arm secured to the stop-stud 35, and has a short arm secured as indicated at 40[a] (Fig. 3) to the pawl 27. The walls of the slot 36 in the pawl, engaging the non-metallic stud 35, limit the swinging movements of the pawl about the pivot 28. The use of the non-metallic stop tends to soften the clicking sound which occurs from the oscillations of the pawl in the operation of the device.

As shown in Fig. 8, the cord or cable passes through a perforation 41 into a recess 41[a] which opens laterally at one side of the drum. The cord is knotted within the recess 41[a] as indicated at 42; and the extremities of the conductors are then connected with the screws 23 and 24.

The igniter E preferably comprises a short hollow handle 43, which preferably is drawn from sheet metal. One end of this member is reduced and provided with a perforation 43[a] through which the outer end of the cable D passes. The outer end of the member 43 is interiorly threaded as indicated at 43[b]; and screwed into the threaded end is a tip-socket or base 44. In the illustration given, this socket is in the form of a metal sleeve which has an inner end wall 44[a] provided with a central perforation. The outer end of the sleeve 44 is interiorly threaded, as indicated at 44[b], to receive the threaded shank of the igniter tip 45. The igniter tip is provided with the usual resistance coil (not shown), and the ends of the coil are electrically connected with the threaded metal sleeve 45[a] which comprises a portion of the shank of the igniter tip. The other end of the coil is connected with the central contact 45[b] which extends through the shank of the tip. When the shank of the tip is screwed into the socket 44, the electrical connections are made in a well understood manner.

A great deal of difficulty has been experienced heretofore in providing the socket 44 with a suitable central contact and properly insulating the central contact. In the present construction, the base end 44[a] of the socket is provided with a central perforation thru which extends a lava-bushing 46. This bushing has a flange 46[a] and a reduced portion 46[b]. The flange 46[a] forms a head which bears against the inner surface of the bottom of the socket 44, while the reduced portion 46[b] extends thru the perforation in the bottom of the base end 44[a]. The lava-bushing is secured in place by a split ring 47.

Thru the lava-bushing 46 extends a central contact, which is in the form of a small bolt 48. The head of this bolt affords a central contact which is disposed in the bottom of the socket 44. The nut 48[a] on the end portion of the screw or bolt 48 bears against the inner end of the lava-bushing. The screw 48 is provided with a small bore which receives the conductor 22. The wire is inserted, and the projecting end of the screw is then deformed or crushed sufficiently to firmly grip the wire. The other wire 21 extends thru a perforation in the flange of the base portion 44[a] of the socket; and, if desired, solder is applied at the upper end of the wire. The cable D preferably is knotted inside the handle, as indicated at 49. This takes the strain off the connections.

The operation of the improved device may be stated briefly. When the igniter is in its socket, as shown in Figs. 1 and 6, the sleeve 43 bears against stops 50 with which the tubular guide member 7 is provided at its inner end. In this position, the cord D is taut and prevents the spring C′ from winding any more of the cable on the drum. In this position, also, the pawl 27 is out of contact with the contact-stud 30 and so the electrical circuit is broken. When the igniter is withdrawn from its socket, the drum is caused to rotate in the direction indicated by the arrow in Fig. 1. At each revolution the tooth 29 of the pawl rides over the contact-stud 30. If now the drum be allowed to turn slowly in a direction to wind the cord on the drum, the tooth 29 will engage the stud 30 and thus latch the drum against further turning movement. The igniter may then be used to light a cigar, i. e. while the cord is loose or unstretched. When it is desired to return the igniter to its socket, this can be effected by drawing the igniter out a few inches and then permitting it to be drawn quickly inwardly under the action of the spring with which the drum is equipped. The rapid rotation of the drum causes the latching pawl which is carried by the drum, to be swung outwardly by centrifugal action, so that the latching tooth will pass without engaging the contact-stud 30. The operation, in this respect, is similar to the operation of the well-known Hartshorn roller.

It is an important feature of the invention that the construction permits the drum to be latched after the igniter has been

drawn to the position for use, so that the igniter may be employed while the cord is loose, which is a great convenience. The accomplishment of this purpose by employing the escapement pawl and the cooperating stationary stud mounted on the casing as parts of the electric circuit, simplifies and cheapens the construction, and enables a device of greater compactness to be provided. The construction lends itself also to simplicity of structure and staunchness. The improved device is not liable to get out of order, is easily operated and may be produced at a moderate cost.

In Fig. 8, the device is shown equipped with a circular name plate 51, which is secured to one end of the shaft A′ by means of a screw 52 which extends into a tapped bore with which the ends of the shaft is provided. In Fig. 4, the handle A^2 is shown provided with a hub portion 53 which fits over the end of the shaft and with a diametrical member 53^a which engages a corresponding slot cut in the end of the shaft. The handle is secured on the shaft by means of a cotter pin 54.

While it is preferred to employ a commutating device which serves also as a drum-latching device of the centrifugal type, other constructions may be used for effecting the purpose. Also, while it is preferred to employ sound deadening means such as a reel composed of non-metallic material and a stop composed of non-metallic material for limiting the oscillation of the latching-pawl, such feature is not vital to the invention. Obviously, if desired, the igniter tip may have substituted therefor, an electric bulb, in the event that it be desired to employ the device for illuminating purposes.

In the modification shown in Fig. 10, the casing is designated A^3. In this modification the bracket 5 is dispensed with, and in lieu thereof, the circumferential flange of the main casing section is provided with a hollow boss 55 which is formed by pressing the metal outwardly. The outwardly struck metal is provided with a perforation which receive a tubular guide member 56 which corresponds with the member 43 in the first described construction. The tubular member 56 is provided at or near its inner end with a flange or bead 56^a. This flange is provided, preferably at three places, with notches 56^b (one shown) which receive clenching lugs 55^a which are formed from the metal of the member 55 and which are disposed adjacent the wall of the perforation therethrough. The metal at the inner end of the guide tube 56 is preferably contracted in diameter and curved inwardly to provide a restricted passage 56^c at the inner end of the guide tube. This affords a nicely rounded surface of which the electric cable may play in the operation of the device. The tubular member 56 is exteriorly threaded to receive a nut, such as the nut 8 mentioned above.

In Figs. 11 and 12, F represents a fuse which is adapted to be inserted in the socket which receives the shank of the igniter tip so that the fuse is interposed between the central contact 48 of the socket and the central contact 45^b of the igniter tip. The fuse F comprises a disk 57 of insulating material, such as hard fiber, and a fuse strip 58 which extends through a slot 57^a in the disk and is provided at its ends with contact-disks 58^a and 58^b. The strip 58 is bent against the side of the disk 57 so that the contact-disks lie against the sides of the insulation disk 57. The contact-disk 58^a is equipped with a clenching prong 58^b which passes through a small perforation 59 in the disk 57 and is clinched on the opposite side of the disk 57. Similarly, the contact-disk 58^a is provided with a clenching lug 58^c. Similarly, the contact-disk 58^b is provided with a clinching lug 58^d which passes through a slot 59^a and is clenched on the opposite side of the insulation disk 57. The arrangement is such that the current will pass from the contact-disk 58^a to the contact-disk 58^b through the fuse-strip 58 only. If desired, the edges of the insulation disk 57 may be equipped with small projections 57^a, so that when the fuse-disk is forced into the socket 44 (before applying the igniter tip), the projections will engage the walls of the socket and hold the fuse in position.

In the use of the cigar lighter, should the the current remain on for an undue length of time, for any reason, the heat developed in the socket 44 will be sufficient to melt the fuse strip 58, so that the circuit will be broken. The fuse strip is made of a suitable material to melt under such conditions, and also to melt in case an undue amount of current should pass through the instrument. In other words, the fuse will serve the regular purposes of an electric fuse, and also will serve as a fuse adapted to be melted by the heat generated by the resistance coil of the igniter tip, should the circuit be left closed at any time, for any reason. In such case, the heat is communicated backwardly from the igniter tip and will cause the fuse strip to be melted. The fuse may be manufactured at very slight expense. It serves the double purpose stated above, and renders unnecessary the use of an electric fuse at another point in the circuit, as for example, mounted on the casing of the device and serving to conduct the current to the terminal 30^a.

While the improved electrical device has been described with relation to the employment of an ignition tip in connection with the socket device shown in Fig. 7, obviously the ignition tip may be replaced by any de-

sired form of current consuming device which may be adapted to the socket device, as for example, a lamp.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the accompanying claims should be considered as broadly as possible in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. In a device of the character set forth, the combination of a frame, a drum mounted therein, a spring for actuating said drum, an electric cable wound around said drum and adapted to turn the drum against the force of its spring as the cable is drawn from the drum, a centrifugal escapement device carried by said drum and electrically connected with one conductor of said cable and serving as a contact, and a frame-carried contact co-acting with said centrifugal device and adapted to be connected with a source of electric energy.

2. In a device of the character set forth, a drum composed of insulating material, having at one side a laterally open chamber and having at the other side a tubular extension, a metal sleeve within said tubular extension, a fixed shaft on which the drum is journaled, a spring-housing contained in said chamber and connected with the drum so that the drum will rotate therewith, and a spring contained in said housing with one end secured to said shaft and having the other end secured to said housing.

3. In a device of the character set forth, a drum of insulating material having a laterally open chamber and provided with perforations intersecting said chamber near its periphery, a cup-like spring housing having its flange portion inserted in said chamber and equipped with lugs engaging said perforations, and a spring confined in said spring-housing.

4. In a device of the character set forth, the combination of a casing comprising a main section and a cap-section, said main section having a wide circumferential flange, a bracket connected with said wide flange and projecting from the casing in a plane parallel with the plane of the casing; a shaft adjustably fixed in said casing and electrically connected with the casing, a drum journaled on said shaft and equipped at one side with a contact sleeve embracing the shaft and provided at the other side with a chamber, a spring in said chamber having one end connected with said drum and the other end connected with said shaft, an electric cable connected with said drum and having one conductor connected with said contact sleeve, a centrifugal pawl mounted on said drum and electrically connected with the other conductor of said cable, and a contact stud insulatingly mounted in the side wall of the casing afforded by said cap-section.

5. In means of the character set forth, a non-metallic drum, a spring adapted to actuate said drum, an electric cable connected with said drum, a latching-pawl mounted on said drum and electrically connected with a wire of said cable, a non-metallic stop serving to limit the oscillations of said pawl, and a stationary latch-engaging stud co-acting with said pawl.

6. In a device of the character set forth, a combination of a frame, a shaft mounted therein, a drum journaled on said shaft, an actuating spring for the drum having one end secured to the shaft and the other end to the drum, a latching-pawl pivotally mounted on said drum, a stationary contact-stud co-acting with said latching-pawl, an electric cable connected with said drum and having one conductor electrically connected with said pawl, and a spring associated with said pawl and tending to throw the pawl to the latching position.

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