April 3, 1962 L. G. HORWITT 3,028,474

ELECTRIC CIGAR LIGHTER

Filed March 11, 1960

Fig. 1

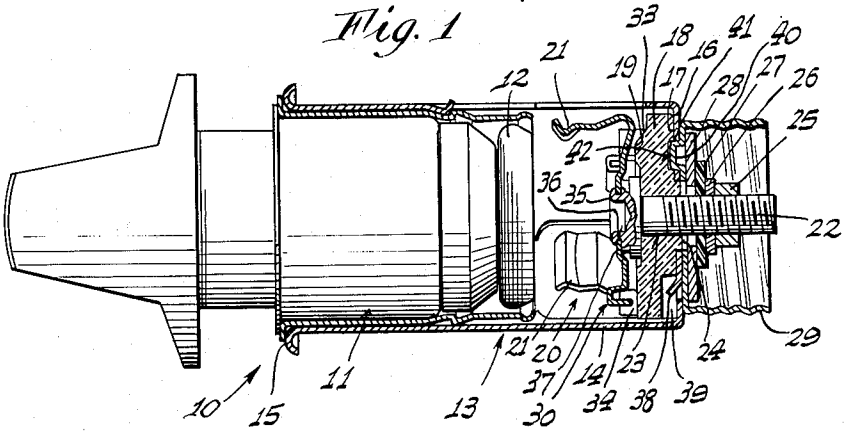


Fig. 3

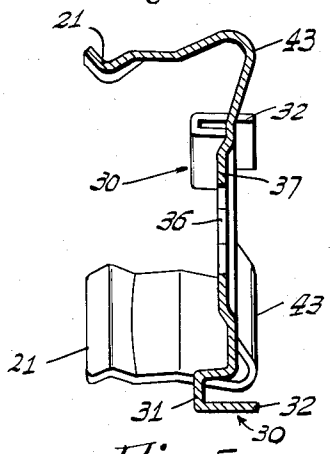


Fig. 2

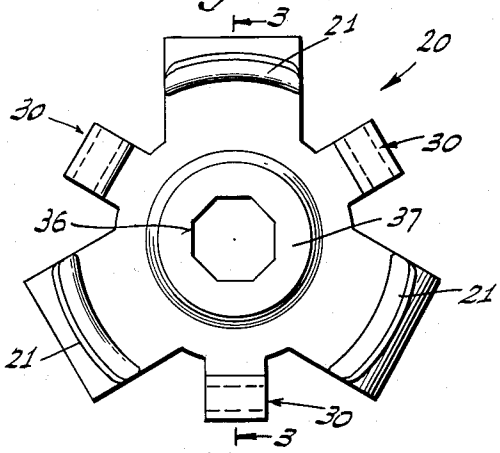


Fig. 5

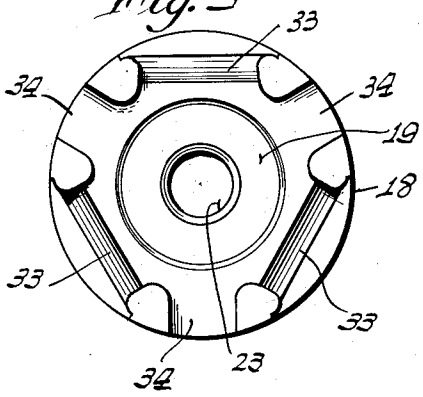
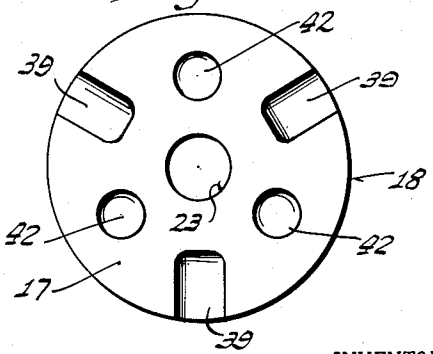


Fig. 4



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ELECTRIC CIGAR LIGHTER

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The present invention relates to electric cigar lighters of the type having an igniting plug that is positionable in a socket in either an energizing or a storage position and removable therefrom for use.

The socket of such a lighter consists of a cylindrical well having an open end and a closed bottom end with the latter being provided with a plurality of equally concentrically spaced bimetal fingers that frictionally engage the plug when it is at its energizing position. The fingers conduct electricity to the plug to cause heating of the igniting coil and with the heat therefrom causes the bimetal fingers to bend to release the plug when the coil has reached a predetermined temperature. In order to have the fingers release the plug at the correct operating temperature of the igniting coil, thereby assuring proper operation of the lighter, it is essential that the fingers concentrically grip and release the plug, that they be free of contact in the socket to be unhampered in their movement and that misusage of the plug in the socket prevent damage to the fingers.

It is accordingly an object of the present invention to provide an electric cigar lighter socket in which the bimetal fingers are prevented from engaging the adjacent socket parts both during assembly and use, and thus be unhampered in their movement.

Another object of the present invention is to provide a socket having bimetal fingers formed from one piece of bimetallic material and in which formed on the same piece are means engageable by the plug to prevent accidental damage to the fingers and for preventing engagement of the fingers with the adjacent socket parts.

A further object of the present invention is to achieve the above objects economically and with a minimum of alteration in the parts of the presently manufactured cigar lighters.

In carrying out the present invention, the socket of the electric cigar lighter is formed of a cylindrical well having a closed bottom end and the bimetal fingers are positioned at the bottom of the well. Secured between the end of the well and the fingers is a disk of insulating and rigid material, such as molded ceramic. The disk has one face which abuts against the bottom of the well while its other face is formed to cooperate with the bimetal fingers and stops, as will be hereinafter apparent, to achieve the objects of the invention, as a one-piece unit, herein called a spider, from a piece of bimetallic material, the bimetal fingers are formed to extend outwardly toward the open end of the well while stops are formed to project inwardly. The fingers and the stops are each three in number in the specific embodiment herein shown and equally concentrically spaced. The stops are positioned in to engage small grooves formed in the other face of the disk to prevent relative rotation between the disk and the bimetal fingers thereby preventing engagement of the fingers with the disk and also serving to space the fingers away from the disk. Moreover, the stops are formed to be reversely bent and thus have a portion extending outwardly in the direction of the fingers to be engaged by the plug when pushed beyond its normal energizing position thereby preventing damage to the fingers by abnormal inward movement of the plug.

Other features and advantages will hereinafter appear.

In the drawing:

FIGURE 1 is an elevation of an electric cigar lighter of the present invention with the socket being shown in section.

FIG. 2 is a front view of the spider formed to have the bimetal fingers and stops.

FIG. 3 is an axial section of the spider taken on the line 3—3 of FIG. 2.

FIG. 4 is an elevation of the insulating disk showing the face thereof that abuts the bottom end of the well.

FIG. 5 is an elevation of the insulating disk showing its other face that is abutted by the spider.

Referring to the drawing, the electric cigar lighter of the present invention is generally indicated by the reference numeral **10** and includes a plug **11** having a cup **12** in which the igniting coil (not shown) is contained. The plug **11** is shown in FIG. 1 in its storage position in a socket **13** while movement toward the bottom end of the well (to the right in the drawing) positions the plug in its energizing position while a reverse movement enables the plug to be removed from the socket for use.

The socket includes a cylindrical well **14** having an open flanged end **15** and a closed bottom end **16**. Abutting the inside of the closed end **16** is a face **17** of insulating disk **18** while the other face **19** of the disk engages at selected portions a spider **20**. The spider member is formed to have bimetal fingers **21**, three in number being specifically shown in this embodiment of the invention though any number of fingers greater than one may be formed, which, in a manner well known in the art, engage the cup **12** when the plug **11** is moved to its energizing position to hold the plug in this position while the fingers conduct electricity to the plug until the igniting coil has reached a predetermined temperature at which time the fingers release the plug for use, the heat from the coil causing opening of the fingers by their being made from bimetallic material.

The spider **20** is secured to a stud **22**, the stud passing through an aperture **23** in the disk, an aperture **24** in the bottom of the well to have threaded thereon a nut **25**. Also encircling the stud is a lock washer **26**, an insulating washer **27** and a reinforcing washer **28** together with a threaded member **29** to which a clamping shell, not shown, is threaded to secure the socket to an aperture in a panel, such as an automobile dashboard.

The stud **22** if connected to one side of a source of electricity will conduct current to the spider member for energizing the plug. With the above construction, it will be appreciated that the parts of the socket are secured together by a relative rotation between the nut **25** and the stud **22**.

Shown in FIGURES 2 and 3 is the spider member **20** which is formed from one piece of bimetallic material. The spider has three identical, equally concentrically spaced bimetal fingers **21** and positioned between the fingers are three identical, equally spaced stops **30**. Each stop is reversely bent to have an outwardly extending portion **31** and an end portion **32**. Shown in FIG. 5 is the face **19** of the insulating disk **18** against which the spider is abutted. There are three beveled grooves **33** into which the fingers are positioned and three grooves **34** for engaging the end portions **32** of the stops. The stud **22** is securely fastened to the spider **20** by the head of the stud **35** being spun over an hexagonal shaped aperture **36** formed in the hub **37** of the spider.

To assemble the socket, the parts are positioned together and only a relative rotation of the nut **25** is needed with respect to the stud **22**. This, however, requires that the stud **22** be held against rotation and to this end in carrying out the present invention the stops **30** are positioned in the grooves **34** and limit the rotation of the spider with respect to the disk. The amount of permitted rotational movement is quite small and because

the grooves 33 are substantially wider than the width of the fingers 21, the fingers are incapable of engaging the sides of the grooves 33 thereby permitting unhampered movement thereof. In addition, as shown in FIG. 1, the ends 32 abut the bottom of the grooves 34, limiting the axial movement of the nut and parts and hence prevent the fingers from engaging the bottom of the grooves 33.

To hold the disk against relative rotation, there is provided bent-in flanges 38 formed in the bottom of the well which are received in radial slots 39 formed in the face 17 of the disk and in addition the threaded member 29 has formed thereon projections 40 which pass through apertures 41 in the bottom of the well to sit within indentations 42 formed in the face 17 of the disk. Thus, all that is required to assemble the parts to form the socket is to place them in their relative positions and thread the nut 25 on the stud 22, the parts thereby interlocking against rotation.

It will be clear that the portion 31 of each of the stops 30 projects beyond the curvature of the fingers as indicated by the reference numeral 43, and hence during use, if the plug is forced inwardly too far into the socket, the cup 12 will abut the portions 31 and prevent deformation of the fingers 43. Moreover, the reversely bent portions 31 will conduct electricity to the cup 12 if the cup is maintained in contact therewith, and thereby provide energization of the igniting coil.

It will accordingly be appreciated that the present invention of an electric cigar lighter provides for a socket that has plug engaging bimetal fingers at the closed end of a well. The fingers are unhampered in their movement thereby decreasing the probability of malfunctioning of the lighter during use. This is economically accomplished by forming the bimetal fingers and stop members from one piece of bimetallic material, the stop members in effect being formed from what formerly consists of scrap and thus enables the elimination of parts with only minor changes in the previous structure of the lighter.

Variations and modifications may be made within the scope of the claims and portions of the improvements may be used without others.

I claim:

1. An electric cigar lighter socket usable with an igniting plug that is positionable in the socket in an energizing position or a storage position and removable therefrom for use comprising a cylindrical well having an open end and a closed bottom end, a disk positioned in the well against the closed end, a one-piece spider member formed from a single piece of bimetallic material to have a plurality of outwardly extending fingers and a plurality of inwardly extending stops, said fingers being engageable with the plug when it is in its energizing position and means for securing the spider and the disk to the closed end of the well with the stops abutting the disk to provide unhampered movement of the fingers.

2. An electric cigar lighter socket usable with an igniting plug that is positionable in the socket in an energizing position or a storage position and removable therefrom for use comprising a cylindrical well having an open end and a closed end, a disk positioned in the well against the closed end, a one-piece spider member formed from a single piece of bimetallic material to have a plurality of outwardly extending fingers and a plurality of inwardly extending stops, said fingers being engageable with the plug when it is in its energizing position and said stops being reversely bent to provide a portion that extends outwardly to abut the plug upon further inward movement of the plug to prevent malformation of the fingers and means for securing the spider and the disk to the closed end of the well with the stops abutting the disk to prevent engagement thereof with the fingers.

3. An electric cigar lighter socket usable with an igniting plug that is positionable in the socket in an energizing position or a storage position and removable therefrom for use comprising a cylindrical well having an open end and a closed end, a disk positioned in the well against the closed end, a one-piece spider member formed from a single piece of bimetallic material to have a plurality of outwardly extending fingers and a plurality of inwardly extending stops, said fingers being engageable with the plug when it is in its energizing position and means for securing the spider and the disk to the closed end of the well with the stops abutting the disk to axially space said fingers from the adjacent surfaces of the disk to thereby provide unhampered movement of the fingers.

4. An electric cigar lighter socket usable with an igniting plug that is positionable in the socket in an energizing position or a storage position and removable therefrom for use comprising a cylindrical well having an open end and a closed end, a disk positioned in the well having one face against the closed end and its other face being provided with slots, a one-piece spider member formed from a single piece of bimetallic material to have a plurality of outwardly extending fingers and a plurality of inwardly extending stops, said fingers being engageable with the plug when it is in its energizing position and means for securing the spider and the disk to the closed end of the well with the stops abutting the disk and being positioned in the slots to prevent relative rotation between the spider member and the disk, said slots being only slightly wider than said stops.

5. An electric cigar lighter socket usable with an igniting plug that is positionable in the socket in an energizing position or a storage position and removable therefrom for use comprising a cylindrical well having an open end and a closed end, a disk positioned in the well having one face against the closed end and its other face being provided with slots, a one-piece spider member formed from a single piece of bimetallic material to have a plurality of outwardly extending fingers and a plurality of inwardly extending stops and a threaded stud secured thereto, said fingers being engageable with the plug when it is in its energizing position and a nut threaded onto the stud for securing the spider and the disk to the closed end of the well with the stops abutting the disk and being positioned in the slots to prevent relative rotation between the spider member and the disk, said slots being only slightly wider than said stops.

6. The invention as defined in claim 5 in which there are as many stops as fingers with the fingers being equally concentrically spaced and the stops being equally concentrically spaced with a stop and fingers being alternately positioned.

References Cited in the file of this patent

UNITED STATES PATENTS

2,236,483	Bahr	Mar. 25, 1941
2,495,657	Kroll et al.	Jan. 24, 1950
2,704,318	Jorgensen et al.	Mar. 15, 1955
2,727,977	Fenn	Dec. 20, 1955
2,734,987	Johnson	Feb. 14, 1956