

1

2,730,605

ELECTRIC CIGAR LIGHTER

Arthur A. Johnson, Bridgeport, Conn., assignor to Automatic Devices Corporation, Bridgeport, Conn., a corporation of Connecticut

Application February 25, 1952, Serial No. 273,219

16 Claims. (Cl. 219—32)

This invention relates to wireless-type electric cigar lighters as used in automobiles and the like, wherein the igniting unit is removable from the holder and may be passed around for use. The present invention is a species of the invention disclosed and claimed in my copending application Serial No. 271,879, filed February 16, 1952, entitled Electric Cigar Lighter.

In this copending application structures are disclosed by which the removable igniting unit is automatically blocked and prevented from being inadvertently shifted to energizing position at the time that it is being replaced on the holder. The means by which this is accomplished comprise stop mechanisms which are automatically operative to prevent movement of the igniting unit to closed-circuit position even though excess force is exerted on the knob, sufficient to effect such movement. The stop mechanisms are operative during replacement of the igniting unit on the holder, and are rendered inoperative after such replacement, when the force returning the igniting unit to the holder is removed.

By the present invention I provide a different and advantageous mechanism by which undesired re-energization of the igniting unit is prevented when the unit is being replaced on the holder, said mechanism being essentially not a stop mechanism as in my copending application, but being instead a releasable drive connection associated with the carrying knob of the igniting unit. The arrangement is such that when the igniting unit is replaced on the holder the knob thereof is essentially free to move inwardly with respect to the body of the igniting unit, and to ultimately engage an abutment on the holder, such movement being possible because the driving connection is not established and resulting in a seating of the igniting unit in a position no deeper than its shallow unenergized position. The free movement of the knob therefore does not effect a closing of the circuit through the heating element, but primarily effects a complete seating of the igniting unit in its storage position. Where the igniting unit carries a friction sleeve or collar which is engageable with the well of the holder, the movement of the knob will completely seat the friction sleeve, thereby properly positioning the igniting unit for energization upon subsequent pressure being applied to the knob after it has been returned to an outward position. Such return is preferably effected by a suitable spring.

Establishment of the driving connection is preferably responsive to the return of the knob to outward position, and accordingly subsequent inward movement of the knob will be productive to close the circuit and energize the igniting unit.

An advantage of the species of the invention disclosed herein is that abutment means may be provided between the holder and the knob which becomes effective when the knob is fully depressed during replacement of the igniting unit, to assume all of the force which might be exerted on the knob. Such abutment means may be simple and rugged in construction whereby it will not

2

be adversely affected or damaged if excessive force should be exerted on the knob.

An object of the invention accordingly is to provide an improved wireless-type cigar lighter of the type preventing inadvertent re-energization of the heating element when the igniting unit is being replaced on the holder, which is extremely sturdy in its construction, remaining operative even if roughly or forcefully actuated.

Another object of the invention is to provide an improved cigar lighter in accordance with the above, which is of simple and economical construction, and which is reliable in use at all times.

Other features and advantages will hereinafter appear.

In the accompanying drawings:

Figure 1 is an axial sectional view of the improved cigar lighter showing the igniting unit in an initial stage of replacement on the holder.

Fig. 2 is a view like Fig. 1 showing the igniting unit at a somewhat later stage, with the knob in a depressed position.

Fig. 3 is a view partly in axial section and partly in elevation, showing the igniting unit fully seated in its storage or unenergized position, the knob being still completely depressed.

Fig. 4 is a view like Fig. 3, but showing the knob in extended or outward position after removal of force therefrom.

Fig. 5 is a view like Figs. 3 and 4, but showing the igniting unit in deep or energizing position in response to subsequent inward movement of the knob to depressed position.

Fig. 6 is a transverse section taken on line 6—6 of Fig. 5.

Fig. 7 is a transverse section taken on line 7—7 of Fig. 5.

Referring to the drawings the improved cigar lighter of this invention comprises a holder 10 and an igniting unit 11, the latter being removably carried in the holder in a storage position as shown in Fig. 4.

The holder 10 comprises a tubular shell 12 having a bezel or flange 13 at its front for engagement with the front surface of an instrument panel 14. At its rear the shell 12 has a threaded cup 15 on which there is screwed a clamping sleeve 16 engaging the rear of the panel 14 to secure the shell 12 thereto.

Within the shell 12 bimetallic contact clips 17 are provided, adapted to engage a metal cup 18 of the igniting unit when the latter is in its energizing position as shown in Fig. 5, for the purpose of closing a circuit through the heating element. The cup 18 contains a heating element 19 which is electrically connected to a metal mounting cup 20 arranged to be engaged by spring fingers 21 of the shell 12 to complete the circuit through the heating element 19, see Fig. 5.

In accordance with the present invention an improved means is provided to enable the igniting unit 11 to be replaced in the holder 10 without danger of inadvertently re-energizing the heating element 19 either momentarily or through a complete heating cycle. The normal or intended energization of the heating element is effected by manipulation of a knob 22 on the igniting unit, and in accordance with the present invention the knob 22 is free to be depressed and to engage an abutment means on the holder during replacement of the igniting unit without the latter being shifted to deep energizing position. During such replacement, the igniting unit will be fully seated in its storage position, and upon removal of force from the knob it will be returned to an outward projecting position whereupon subsequent force to depress the knob will result in the heating coil 19 becoming energized.

Accordingly, as shown in the drawings, the igniting

3

unit 11 is provided with a tubular body 23, preferably formed of molded insulating material, to which the mounting cup 20 is threaded. The body 23 has a helical compression spring 24 engaging a friction sleeve 25 arranged to be frictionally received in the tubular shell 12 of the holder. The sleeve 25 may have resilient fingers 26 lanced therefrom as shown in Figs. 1 and 2, and is preferably provided with an outturned flange 27 at its front end, for engagement with the flange 13 of the holder to limit the inward movement of the friction sleeve as shown in Figs. 3, 4 and 5.

The body 23 of the igniting unit carries a plunger 23a on the front end of which threads 23 are provided to which the knob 22 is screwed. The knob 22 is thereby slidably mounted on the body 23. At its front end the body 23 of the igniting unit has threads accommodating a nut 29 by which a tubular metal collar 30 is secured to the body. The collar 30 functions as a mounting for a pivot pin 31 on which a latch member 32 is carried. The member 32 extends into a longitudinal slot 33, Fig. 7, provided in the plunger 23a of the igniting unit, and the latch member 32 is urged in a clockwise direction as viewed in Figs. 1 through 5 by a wire spring 34.

Cooperable with the latch member 32 is an arm 35 pivotally mounted on a pin 36 carried by the igniting unit body 23. The cooperable member 35 is urged in a counterclockwise direction as viewed in Figs. 1 through 5 by a wire spring 37.

The members 32 and 35 have cam surfaces 38 and 39 respectively, said surfaces being engageable with each other during manipulation of the igniting unit as shown in Figs. 2 and 3. Adjacent the cam surfaces 38 and 39 shoulders 40 and 41 are provided on the members 32 and 35 respectively, said shoulders being adapted to have interlocking engagement as indicated in Figs. 4 and 5.

The knob 22 is normally held in an outward or projecting position with respect to the igniting unit body 23 and to the holder 10 by a helical compression spring 42 which is weaker than the spring 24 for a purpose later disclosed, said outward position being indicated in Figs. 1, 4 and 5.

In a wall of the friction sleeve 25 a slot 43 is provided to accommodate a rounded finger-like lateral extension 44 of the latch member 32, said extension 44 being arranged for engagement with the front edge or lip of the holder shell 12 as shown in Figs. 3, 4 and 5 to depress the latch member or shift it counterclockwise to a position wherein it can actively cooperate with the member 35 if the latter is in a suitable cooperable position such as indicated in Figs. 1, 2, 4 and 5.

The above construction provides in effect releasable driving connection between the knob 22 and the heating element 18, 19, such driving connection when operative enabling a user to shift the igniting unit inward on the holder 10 to energize the unit in response to inwardly directed force applied to the knob 22. However, the driving connection is normally inoperative during replacement of the igniting unit on the holder, thus enabling the knob 22 to have a free movement uncoupled or disconnected from the heating element.

A detailed explanation of the operation of the device is as follows: When the igniting unit 11 is removed from the holder 10 the parts of the igniting unit normally occupy the positions shown in Fig. 1. This figure depicts the igniting unit in the first stage of its replacement on the holder. As the igniting unit is moved inward on the holder the resistance offered to insertion of the friction sleeve 25 will, because the spring 24 is stronger than the spring 42, cause the knob 22 to move inwardly with respect to the friction sleeve and the rest of the igniting unit, compressing the spring 42 as illustrated in Fig. 2. During such inward movement of the knob 22 the coupling member 35 will shift past the latch member 32, and when the spring 42 is substantially fully compressed the knob 22 comes into engagement with the flange 27

4

of the friction sleeve 25. Further inward movement of the knob 22 will result in the friction sleeve 25 being forced inward to a fully seated position in the holder as shown in Fig. 3. It will be seen that for such fully seated position the heating element comprising the cup 18 and the coil 19 is out of engagement with the contact clips 17, and therefore the circuit in the heating element remains open. Thus there is avoided inadvertent re-energization of the heating coil during replacement of the igniting unit on the holder. Also the return of the igniting unit in its fully seated storage position results in the latch member 32 being depressed by engagement of the finger 44 thereof with the rim of the shell 12 of the holder. The latch member is thus cocked or put in readiness for interlocking engagement with its cooperable member 35. When manual force is removed from the knob 22 the action of the compression spring 42 will be such as to shift the knob 22 forward to an outward or extended position as shown in Fig. 4, and during such movement the cam surfaces 38 and 39 of the members 32 and 35 will be operative to enable the front portion of the member 35 to bypass the rear portion of the latch member 32, thereby resulting in said members moving into interlocking engagement. For the storage position shown in Fig. 4 it will be noted that the driving connection between the knob 22 and the rest of the igniting unit is normally operative. A subsequent application of force to the knob 22 to depress the latter will result in the heating element being shifted inward to energizing position as shown in Fig. 5, due to the locking engagement of the driving connection or coupling comprising the latch 32 and cooperable member 35.

Upon proper energization of the heating element the bimetallic clips 17 will flex outward and release the element, whereupon the compression spring 24 will be operative to shift the igniting unit body 23, the knob 22 and the heating element to the storage position shown in Fig. 4, in readiness for removal of the igniting unit for use. Upon such removal, it will be understood that disengagement of the finger 44 of the latch member 32 will enable said member to shift upward or clockwise to the position shown in Figs. 1 and 2 whereupon it will be in readiness for a repetition of the replacement operation described above.

It will be noted that with the igniting unit in the position shown in Fig. 4 it may be readily shifted inward again for a re-light, if this should be desired. Thus, if a user after initially actuating the lighter cannot for some reason immediately remove the igniting unit to use it, he may re-energize the unit by simply moving it inward to the position of Fig. 3.

During the normal operation of the lighter, automatic release of the igniting unit by the bimetallic clips 17 when the heating element is heated will not result in the friction sleeve shifting forward to any extent from its fully seated position shown in Figs. 3 and 4.

The structure as provided above by the present invention produces what I consider a "free" movement of the knob 22 during replacement of the igniting unit on the holder, for the reason that the knob may be initially depressed against the action of the spring 42 without closing of the circuit or shifting of the igniting unit to its deep position. After the knob is initially depressed, then it engages the friction sleeve 25 and forces the latter into the holder, to its proper position thereon. It will be understood that when such action has occurred the knob will engage the flange 27 of the friction sleeve, the said flange in turn engaging the bezel 13 of the holder shell 12, and therefore a sturdy abutment means is provided to withstand considerable pressure which might be applied to the knob 22.

Accordingly it is seen that reliance is not had on small latching parts or the like to withstand force exerted on the knob, but instead said force is counteracted by a positive abutment established by the holder 10 and the instrument panel 14.

5

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. A wireless type cigar lighter comprising a holder; an igniting unit adapted to be stored on the holder, said unit being removable for use and having an electric heating element; a carrying knob on the igniting unit; means normally operative when the igniting unit is stored on the holder, closing a circuit through the heating element in response to a predeterminate inward movement of the knob with respect to the holder; and automatic means rendering said immediately-preceding means inoperative to close said circuit when the igniting unit is first being replaced and the knob is moved inward said predeterminate distance on the holder, thereby to prevent inadvertent re-energization of the heating element during such replacement.

2. The invention as defined in claim 1, in which there is cooperable abutment means on the knob and holder, to limit the extent of inward movement of the knob during replacement of the igniting unit.

3. A wireless type cigar lighter comprising a holder; an igniting unit adapted to be carried on the holder, said unit being inwardly shiftable thereon from an outward, open-circuit, normal storage position to an inward energizing position and being removable for use; means closing a circuit through the igniting unit in response to inward shifting of the latter on the holder from open-circuit to energizing position; means normally operative when the igniting unit is stored in open-circuit position on the holder and including a carrying knob constituting a part of the igniting unit, for manually effecting such shifting in response to a predeterminate inward movement of the knob; and automatic means rendering said immediately-preceding means inoperative to close said circuit when the igniting unit is out of said normal storage position and is first being replaced on the holder and the knob is moved inward said predeterminate distance, thereby to prevent inadvertent re-energization of the heating element.

4. The invention as defined in claim 3, in which the knob is movably mounted on the igniting unit, and in which the normally operative means enables the knob to have a limited free inward movement without shifting the unit during replacement of the latter.

5. The invention as defined in claim 3, in which the knob is movably mounted on the igniting unit, in which there is a spring normally holding the knob in an outermost position on said unit, and in which the normally operative means comprises a releasable driving connection between the knob and the remainder of the igniting unit, said connection being rendered operative in response to return of the knob to its outermost position by said spring after the igniting unit has been replaced in the holder.

6. The invention as defined in claim 4, in which there is abutment means on the knob and holder, to limit the extent of free movement of the knob during replacement of the igniting unit.

7. The invention as defined in claim 6, in which the abutment means includes a friction sleeve movably mounted on the igniting unit and frictionally receivable in the holder, said sleeve, knob and holder having abutable portions coming into engagement to terminate the inward movement of the knob.

8. A wireless type cigar lighter comprising a holder having an electrical circuit; an igniting unit removably carried by the holder, said unit having a heating element for energization through the circuit of the holder, and having mechanism including a manually operable carrying knob for closing said circuit through the heating element in response to inward movement of the knob on the holder to a predeterminate innermost position; yieldable means for moving the knob to, and normally

6

holding it in, an outward position on the holder; abutment means blocking the knob against movement beyond said predetermined innermost position on the holder; automatic means normally rendering the said mechanism inoperative to close said circuit when the igniting unit is being replaced on the holder and the knob is moved inward to said innermost predetermined position; and means rendering said automatic means inoperative in response to outward movement of the knob from said position by said yielding means after removal of pressure from the knob, whereby subsequent inward movement of the knob will effect a closing of the said circuit.

9. The invention as defined in claim 8, in which the igniting unit has a body portion and a friction sleeve movable on said portion and frictionally receivable in the holder, and in which the abutment means includes a flange on the friction sleeve, engageable with the knob, and includes a flange on the holder, engageable with the flange of the friction sleeve.

10. The invention as defined in claim 8, in which the knob is mounted on the igniting unit for movement with respect to the heating element, in which the circuit-closing mechanism includes a releasable and automatically resettable driving connection having a movable latch and a member cooperable therewith, connected between the heating element and knob to couple the same for simultaneous inward movement, and in which the automatic means rendering the said mechanism inoperative includes a spring normally holding the latch in a retracted position away from locking engagement with its cooperable member.

11. The invention as defined in claim 8, in which the knob is mounted on the igniting unit for movement with respect to the heating element, and in which the circuit-closing mechanism includes a releasable and automatically resettable driving connection between the heating element and knob.

12. The invention as defined in claim 10, in which the heating element is movable on the holder between a shallow, storage, unenergized position and a deep energized position, and in which there is means for shifting the latch to a position providing for locking engagement with its cooperable member, in response to the heating element being placed in its shallow position on the holder.

13. The invention as defined in claim 10, in which the latch and cooperable member have cam portions bypassing each other when the knob is moved outward from its innermost position, in which the said member cooperable with the latch is movably mounted, and in which there is a spring for yieldably holding the cam portion of said member in an extended position with regard to the latch.

14. A wireless type cigar lighter comprising a holder having an electrical circuit; an igniting unit removably carried by the holder, said unit having a heating element for energization through the circuit of the holder, and having mechanism including a manually operable carrying knob for closing said circuit through the heating element in response to inward movement of the knob on the holder to a predetermined innermost position, said mechanism including a releasable driving connection connected to the knob; yieldable means for moving the knob to and normally holding it in an outward position on the holder; automatic means normally releasing the driving connection to render said mechanism inoperative to close the circuit when the igniting unit is being replaced on the holder, and permitting inward movement of the knob with respect to the igniting unit to said innermost position during such replacement; and means establishing said driving connection when the igniting unit is replaced, in response to subsequent outward movement of the knob by said yielding means after removal of pressure from the knob, whereby a later inward movement of the knob to said innermost position will effect a closing of the said circuit.

15. The invention as defined in claim 14, in which the

7

means establishing the driving connection comprises a member movably mounted on the igniting unit, engageable with and shifted by the holding device when the igniting unit is being replaced thereon.

16. The invention as defined in claim 14, in which the igniting unit has a shallow, storage position and a deep energizing position on the holder, in which the knob is movable on the igniting unit with respect to the heating element, in which the releasable driving connection is connected between the knob and the heating element, and in which the later inward movement of the knob, effecting a closing of the circuit, shifts the igniting unit to its deep energizing position on the holder.

5 Re. 21,870
1,736,544
2,219,548
2,223,654
2,224,034
2,243,639
10 2,276,215
2,288,005
2,319,687
2,386,168
2,514,171
15 2,657,297

8

References Cited in the file of this patent

UNITED STATES PATENTS

Lehmann	Aug. 5, 1941
Mead	Nov. 19, 1929
Johnson	Oct. 29, 1940
Ashton	Dec. 3, 1940
Lehmann	Dec. 3, 1940
Lehmann	May 27, 1941
Lehmann	Mar. 10, 1942
Lehmann	June 10, 1942
Johnson	May 18, 1943
Pattberg	Oct. 2, 1945
Waltner, Jr.	July 4, 1950
Johnson	Oct. 27, 1953