Sept. 19, 1933. H. MANN 1,927,800

AUTOMATIC CIGARETTE LIGHTER

Original Filed April 18, 1929 2 Sheets-Sheet 1

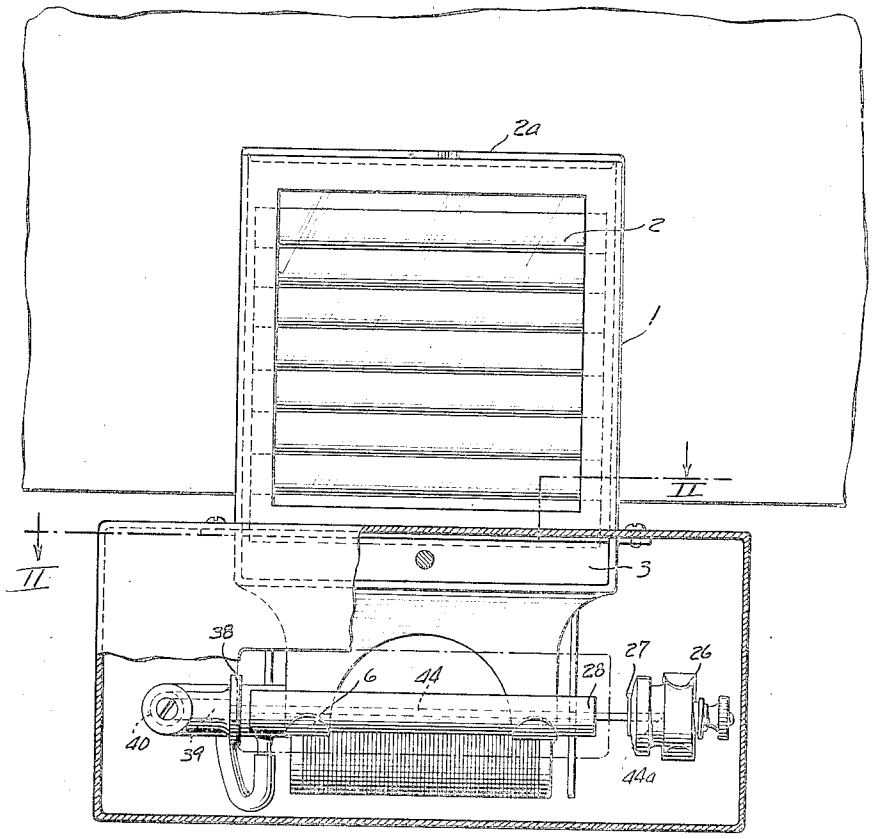


Fig. 1.

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INVENTOR

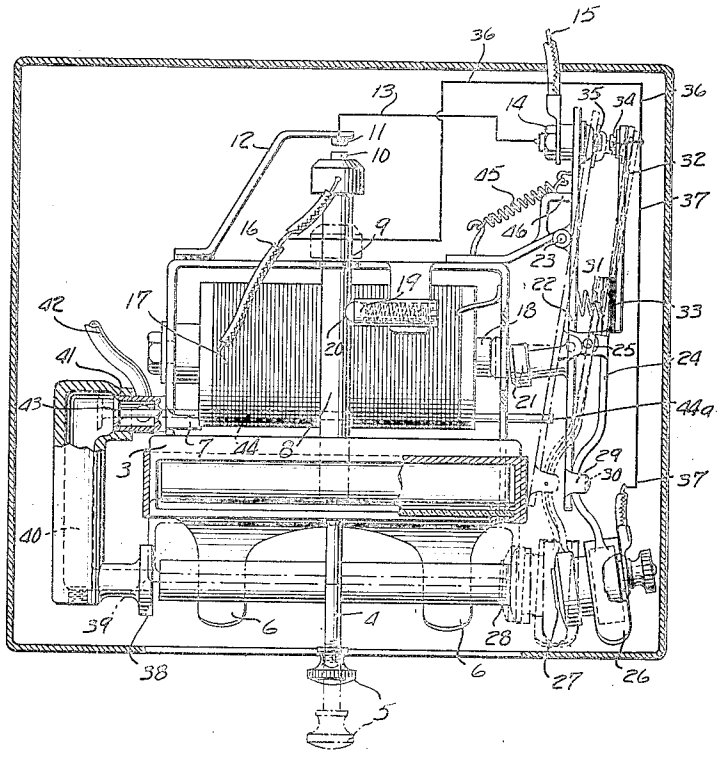
BY
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FIG. II.



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UNITED STATES PATENT OFFICE

1,927,800

AUTOMATIC CIGARETTE LIGHTER

Harry Mann, Monticello, N. Y., assignor to William B. Hurlburt, New York, N. Y.

Application April 18, 1929, Serial No. 356,085
Renewed February 9, 1933

8 Claims. (Cl. 219—32)

This invention relates to apparatus which are usually used as automatic cigarette lighters, and as an automatic cigarette lighter it embodies in one unit a container, feed, lighting and automatic release.

Among the particular objects are simplicity of operation, positive lighting without flame, and automatic release when the cigarette has been lighted. Its coordinated functioning is such that it is perfectly safe against the chance of unintentional burning, besides being entirely automatic when once set.

In the preferred form of my automatic lighter, it is particularly suited as an accessory installation for automobiles. In such cases the complete unit is fixed in position and wired to the battery already existing in the car, usually to the part of a circuit including the ammeter, which thereby indicates that the lighter is functioning.

While heretofore some automatic lighters have been made with spirits that are ignited, and in turn burn the end of the cigarette more or less, and electric heating wires have been used to light cigarettes in conjunction with a separately operated feed and purely mechanical means of control,—as will be seen from the more detailed description hereinafter set forth. My invention is a coordinated automatic device with distinctive safety features which make it foolproof and insure a uniform operation.

Among the important features is the magnetic control which insures the functioning and automatic operations in their proper sequence, and also with great simplicity. No danger can result from inattention or oversight.

In all, the complete apparatus is susceptible of being manufactured in compact form with a character of parts and workmanship lending themselves to very low-cost manufacture.

In the particular form hereinafter described and shown in the drawings the lighter is adapted for use on an automobile. However, it may be embodied in a case such as suitable for store use, or for house or office use, by providing suitable means for slight suction, such as a small electric motor or a pulsating magnet, the current for which is automatically switched in by the starting of the apparatus by one voluntary operation,—when a lighted cigarette is desired.

Also, instead of one voluntarily actuated push-rod lever or button, the starting of the apparatus may be effected by the dropping of a coin or token, which is arranged to actuate the starting mechanism as in vending machines, in which form it dispenses cigarettes and lights each one as it dispenses it, with the automatic features preventing any burning up of the cigarette beyond a good light.

While my invention may be embodied in various designs, one form is shown in the accompanying drawings illustrating the various features of the device and details of the mechanism,—in which:

Fig. I is a front elevation with part of the casing broken away.

Fig. II is a horizontal section on the line 2—2 of Fig. I.

The casing 1 is a suitable magazine for holding a desired number of cigarettes and may have a glass front 2, and a suitable lid 2^a for filling and protection. This casing is open at the bottom and registers with a rectangular frame 3 which is shiftable horizontally by means of the pusher 4, so that a cigarette may drop from the magazine into the frame and pulling the knob 5 drops the cigarette into the supporting fingers 6—6, thus positioning the cigarette for the automatic lighting.

The pusher-rod 4 is then pressed in, replacing the frame 3 under the magazine, but the frame is also permitted to move still further in as a sixteenth or eighth of an inch, limited by suitable stops, such as 7, for the following purpose. On the back of the frame 3 an additional rod 8 extends through a suitable bushing or guide 9, and has at its extremity an electric contact point 10 juxtaposed to another contact 11 supported on a spring member 12 insulated from the frame. This second contact 11 has a wiring connection 13, which through binder post 14 and lead wire 15 establishes electric connection with the source of current, such as the battery in an automobile. The contact 10 on the rod 8 is connected with wire 16 to one end of a magnet coil 17 having a core 18. A ball-detent 19 is spring-pressed into a notch 20 in rod 8 in such a position that pressure on the knob 5 permits the forcing of contact 10 into contact with point 11, but when pressure is relieved on the knob 5 the ball-lock restores rod 8 to a position where the frame 3 registers under the magazine,—and separates contact points 10 and 11.

At one end of the magnet an armature 21 is so supported that when the magnet 17 is energized the armature is pulled into contact with the core 18 by the swinging of the armature and blade 22 on which it is supported, about the pivot 23 carried on a fixed support of the framing.

This armature and blade 22 have mounted thereon a second bar or blade 24 on a pivot 25, so

that bar 24 can, as a whole, pivot slightly with respect to the armature blade or bar member 22. The bar 24 has at one end a casing 26 adapted to hold an electric heating coil 27, with its heating end positioned opposite one end 28 of the cigarette to be lighted. The movement around pivot 23 and the secondary pivot 25 permits the heating coil 27 to move into contact and be pressed gently against the end of the cigarette 28,—so as to provide for the lighting as hereinafter described, provide for stopping the heating coil after proper ignition, and then retraction of the heating coil and its casing and arm 24 to inoperative lighting position.

For the functioning, the armature blade 22 has two ears 29 overlapping the adjacent edge of the lighter bar or blade 24 with lips 30 which limit the separation of the two bars at that point. Near the secondary pivot 25 a spring 31 is arranged to force the two bars apart on one side of the pivot 25, thus normally displacing relatively the blade 32 attached to, but insulated at 33 from bar 24, so that a contact point 34 on the blade 32 is kept normally out of contact with the contact point 35 supported on the end of the bar 22. Contact 35 is connected at binding post 14 and to the lead 15 connected with the battery.

The contact point 34 is also in suitable manner connected by wiring 36 to the wire 16, which in turn connects with and serves to energize the magnet. Also the contact 34 has the electrical connection through suitable wiring 37 to the heating coil 27, and in turn 27 has a ground connection through its casing 26 and bar 24 to the main framing.

At the end of the cigarette to be lighted, opposite to the lighting end, a stop or small plate 38 positions the cigarette,—but also has in its centre a hole 39 which serves to provide a draft by suction through the cigarette for cooperation with the heating coil, to light the other end. This suction is provided by the hole 39 leading to pipe 40 which connects with the union 41 that in turn has a tube 42 connecting in any suitable manner with a source of slight suction directly or indirectly from the intake manifold of an automobile. In practice this vacuum tube 42 can be connected with a windshield wiper suction pipe. At the junction of pipe 40 and the union 41 a valve 43 has a stem 44 extending close to the armature bar 22 when in inoperative position, but this end 44^a of the valve rod is so arranged that when the magnet is energized and bar 22 pulled around the pivot 23, it strikes the valve stem end 44^a and forces the valve 43 to open,—thus causing the suction to function and draw air through the hole 39 and through the cigarette,—so long as the armature is held against the core of the magnet.

The entire double bar or blade mechanism while drawn in one direction by the armature, is normally drawn in the other direction by spring 45, which is of suitable tension to quickly release the armature the moment the energizing current is broken, and cause the bar 22 to assume normal position against the stop 46.

The pivot-and-bar system is shown in its inoperative position in full, and in dash-dot lines it shows the lighter coil against the cigarette end, starting the lighting function,—and the ignition or heating is furthermore shown dotted in a third position, which represents a further slight movement of the heater that is occasioned by the burning away and crumpling very slightly the end of the cigarette so soon as it has been well lighted.

Thus it will be seen that the lighter contacts with the cigarette, is heated and starts the lighting operation, and the mere effect of the slight turning of the end of the cigarette provides a further slight movement which automatically cuts out the current and retrieves the lighter clear of the cigarette end and stops the suction. In this manner lighting is entirely automatically effected and the cigarette is prevented from excessive burning, but the lighting functioning continues until a good light has been obtained, sufficient to permit a slight crumpling of the end of the cigarette to automatically stop the operation.

Having described the various parts for the functioning of the automatic lighter in the form illustrated, the operation will be understood as follows:

Pushing in the bar 4 to the full extent closes the contacts 10—11, thereby battery current passes to the magnet coil which pulls the armature 21 against the core 18. The movement of bar 22 striking the valve stem 44 instantly provides suction through the hole 39.

The lighter coming in contact with the cigarette end 28 is stopped from moving as far as bar 22 moves, and thereby causes the bar 24 to pivot slightly at 25, and thereby force the closing of contacts 34—35. With this operation the circuit is closed from battery to the heating coil through wiring 37, and the heater starts to function.

At this time the rod 4 may be released and assume a normal position with the spring pressed ball-latch 20, bringing contacts 10 and 11 apart,—because the closing of the contacts 34—35 establishes through wiring 36 a circuit connection to the armature direct, and this is maintained thereby holding the armature in contact with the core until the heating coil snaps back after lighting. This heating coil as it gradually compresses the burning end of the cigarette 28 moves into the dotted position, causing bar 24 to pivot at 25 and thereby separate the contacts 34—35 which instantly deenergizes the coil, and the spring 45 pulls the lever member system around the pivot 23, to its normal position shown in full lines, with all current cut off and ready to be again set into operation by the single operation of pressing the bar 4.

While in the form shown the rod 4 directly actuates the contacts for closing the circuit to begin the automatic operation, it will be understood that any movement of the frame 3, in similar manner, may actuate contact-closing members in any desired arrangement. Likewise the latch 19 may be of any different form suitable to meet the conditions.

While I have shown the automatic cutoff effected by the movement of the lighting coil pad 27, it will be understood that in some designs the lighting pad may be stationary and the abutment 38 through which suction is created, can be arranged to move slightly with the crumpling of the opposite end of the cigarette, and such slight movement of the suction end of the apparatus will in such case be mounted with suitable contact members actuated by that slight movement,—to effect the automatic cutout. That is, instead of the cigarette being stationary and the lighting pad moving, the abutment may move slightly and force the cigarette against the stationary lighting pad; in any case, the slight movement caused by the burning of the cigarette end is used to automatically actuate the cutout of the apparatus and prevent undue burning of the cigarette even

though no attention is given to the lighting operation.

I have also found that the metal supports or fingers 6—6 are preferably made to provide a minimum of surface contact with the cigarette, as by serrating the sheet metal of the fingers, in order to prevent the accumulation of dampness on the cigarette and assure the best functioning of the lighting.

While one form of suction valve is described and illustrated, any other suitable valve, as, for instance, a small piston valve can be actuated in one direction or positively actuated in both directions to assure perfect functioning.

These and various other modifications may be made in my lighter, and in certain forms some and not all of the automatic features may be used to provide a lighter most effective for some particular use.

What I claim and desire to secure by Letters Patent is:

1. An automatic cigarette lighter combined with a magazine to hold a plurality of cigarettes including means for voluntary release from the magazine of a single cigarette therefrom to a positioning holder, a positioning holder, lighting means automatically actuated upon the release of the single cigarette to adjust the cigarette with respect to a lighting pad and start a lighting current, and means for automatically shutting off the current when the cigarette has been lit and is slightly shortened by crumpling of the tobacco or burning away of the paper at the end including a cutout switch and means for actuating the same by a predetermined movement of the lighting pad.

2. An automatic cigarette lighter including an electric heating pad, a cigarette and means to hold the same in a predetermined position for lighting, means for automatically pressing the pad in contact with the cigarette, means for automatically and simultaneously creating suction at the opposite end of said cigarette, and means for automatically cutting off the heating current and suction by a predetermined movement of the heating pad resulting when the cigarette has shortened by slight crumpling of the lighted end and under pressure of the heating pad.

3. A cigarette lighter comprising a holder for a cigarette, means adjacent one end of said holder to automatically make effective suction through a cigarette positioned in said holder and a lighting pad actuated by automatic means to press it against the other end of said cigarette, and means for automatically withdrawing the heating pad after a slight movement of the pad due to the crumpling of the burned end of the cigarette when lit.

4. An automatic cigarette lighter comprising voluntary holding and positioning means for a cigarette, integrally incorporated automatically functioning lighting mechanism including a lighting pad automatically positioned for lighting the positioned cigarette, and automatic means for withdrawing said pad out of contact with the cigarette actuated by predetermined movement of said pad resulting after a slight burning and compression of the material at the lighted end of the cigarette.

5. In an automatic cigarette lighter, an ignition circuit for lighting a cigarette supported in the lighter, including a lighting pad in said circuit, a single means for positioning a cigarette and switching in the ignition circuit, automatic magnet means for maintaining said lighting pad thereafter in contact with one end of the cigarette to be lit, and means for automatically stopping the heating of the lighting pad actuated by a predetermined movement of said pad resulting when a small portion of the end of the cigarette has been burned.

6. An electric cigarette lighter having an electric circuit including means for automatically closing the circuit or cutting it off, comprising an igniting pad, a magnet coil, an armature actuated thereby interconnected with said igniting pad to move the igniting pad into a slightly pressed contact automatically with the end of an automatically positioned cigarette, and automatic means to break the circuit effected by further preestablished movement of the igniting pad to automatically retract the pad out of contact with the contained cigarette.

7. A cigarette lighter including a lighting circuit and a cigarette, means to hold said cigarette in a predetermined position and automatic means comprising a lighting pad, means to hold the cigarette with said lighting pad in pressed contact at one end, an abutment at the other end of the cigarette including means for effecting suction, and automatic means for cutting out the lighting circuit actuated by a slight relative movement of the lighting pad with respect to the support due to crumpling of one end of the cigarette upon being ignited.

8. An automatic cigarette lighter having a magazine for a plurality of cigarettes, a holder for a single cigarette below the same with means for automatically lighting the same and automatically cutting out the lighting, comprising voluntary means for releasing a single cigarette to drop into a position for lighting, and means automatically started by the movement of the member actuated with the voluntary release of each cigarette including an automatically closing ignition circuit, and automatic means for making suction effective simultaneously with the lighting, an ignition pad with support for pressing the same against one end of the cigarette, and automatic means for retracting the lighting pad, stopping the suction at the cigarette and cutting out the ignition current.

HARRY MANN.