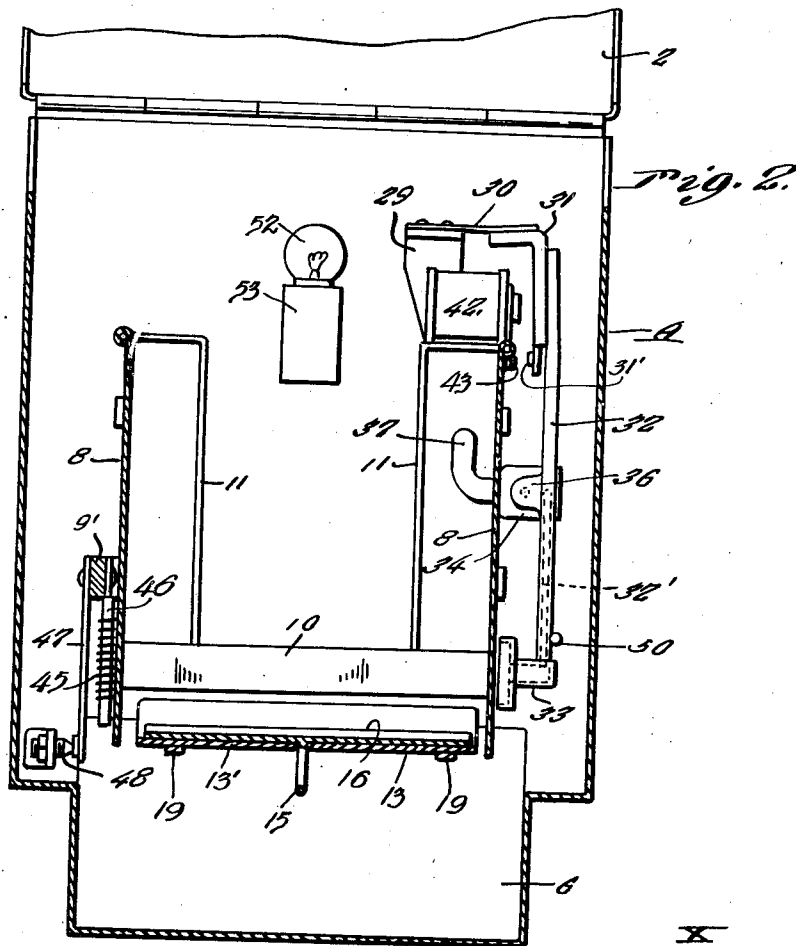
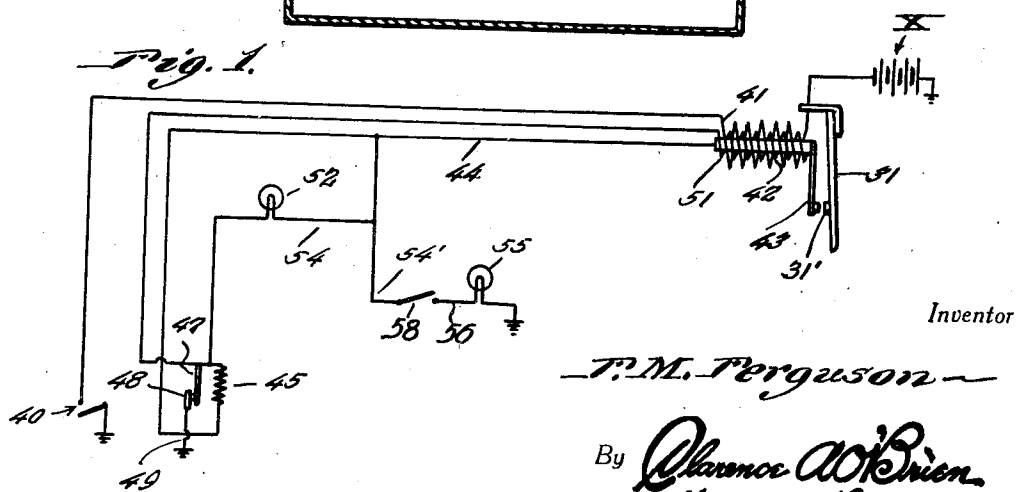


F. M. FERGUSON

AUTOMATIC CIGARETTE LIGHTER

Filed Oct. 4, 1937

3 Sheets-Sheet 1



Inventor

-T. M. Ferguson-

By Clarence W'Brien
Hyman Berman

Attorneys

April 26, 1938.

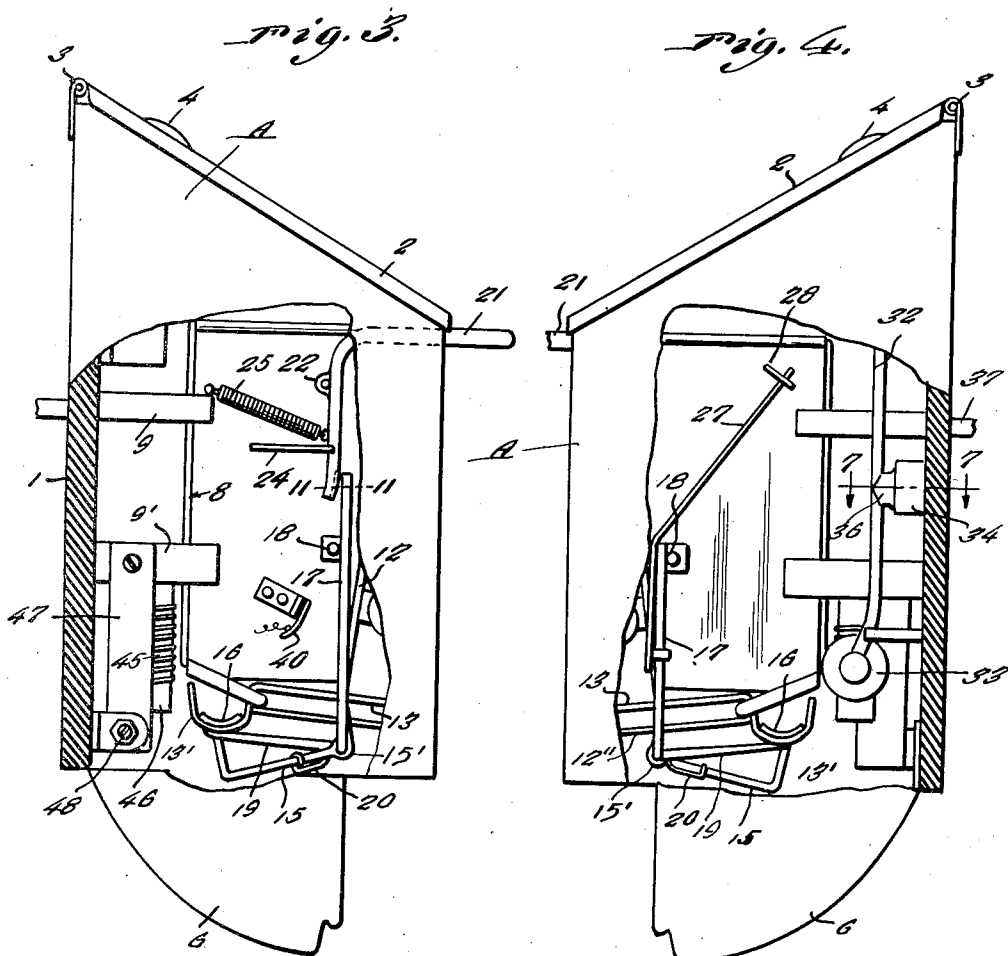
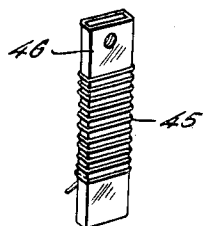
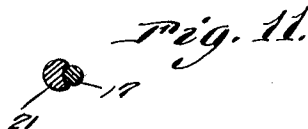
F. M. FERGUSON

2,115,099

AUTOMATIC CIGARETTE LIGHTER

Filed Oct. 4, 1937

3 Sheets-Sheet 2



Inventor

F. M. Ferguson

By *Clarence W'Brien,*
Hyman Berman.

Hyman Berman

Attorneys

April 26, 1938.

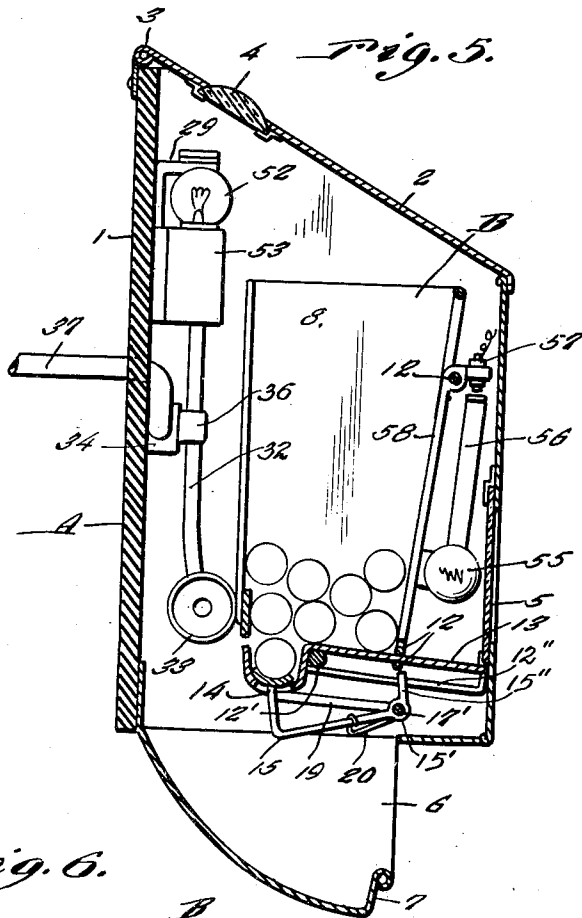
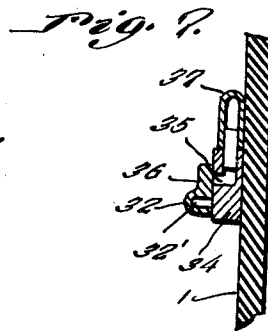
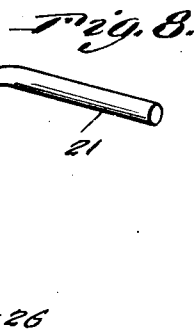
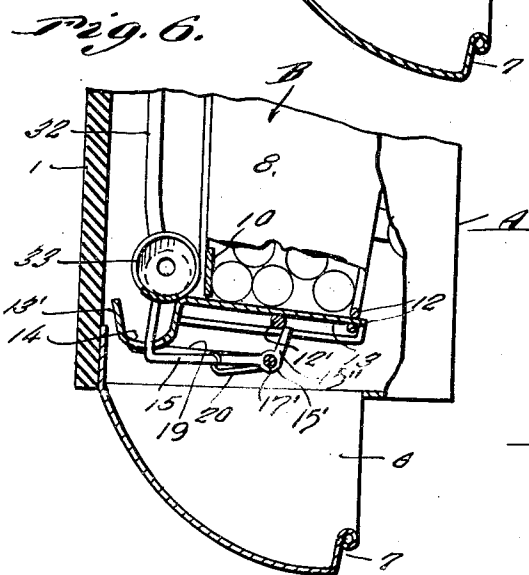
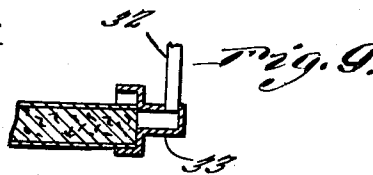
F. M. FERGUSON

2,115,099

AUTOMATIC CIGARETTE LIGHTER

Filed Oct. 4, 1937

3 Sheets-Sheet 3



Inventor

F. M. Ferguson

By *Clarence A. O'Brien*
Hyman Berman

Attorneys

UNITED STATES PATENT OFFICE

2,115,099

AUTOMATIC CIGARETTE LIGHTER

Frank M. Ferguson, Caretta, W. Va., assignor of
one-half to Chapman I. Johnston, Six, W. Va.

Application October 4, 1937, Serial No. 167,277

4 Claims. (Cl. 312—86)

This invention relates to an automatic cigarette lighter, mainly designed for motor vehicles, the general object of the invention being to provide a magazine for holding cigarettes, and means actuated by a hand lever for taking a cigarette from the magazine and moving the cigarette to a point where it will be engaged by a vacuum means which presses the cigarette against a lighter coil to ignite one end of the cigarette, after which the cigarette is dropped into a chute where it can be picked up by the smoker.

Another object of the invention is to provide signal means for indicating when the cigarette is lighted and for indicating when the magazine needs refilling.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a diagrammatic view of the circuits.

Figure 2 is a vertical sectional view through the device, and looking toward the rear thereof.

Figure 3 is a side view with parts broken away.

Figure 4 is a view looking toward the opposite side, with parts broken away.

Figure 5 is a vertical sectional view taken from front to rear.

Figure 6 is a view of the lower portion of Figure 5, but with the parts in a different position.

Figure 7 is a section on line 7—7 of Figure 4.

Figure 8 is a view of the hand lever.

Figure 9 is a sectional view through the vacuum cup and a portion of a cigarette.

Figure 10 is a view of the lighter.

Figure 11 is a sectional view on line 11—11 of Figure 3, but showing the hand lever and the part engaged thereby in contacting relation.

In these drawings, the letter A indicates a housing, the back of which is formed of a plate 1 of non-conducting material and the rest of the housing may be formed of metal or any other suitable material. The upper end of the housing slopes downwardly and forwardly and is covered by a door 2 which is hinged at its rear end to the plate 1, as shown at 3. This door has a hole therein which is covered by a lens 4, preferably of red color, and the front of the housing has an opening therein covered by a transparent mem-

ber 5. A chute 6 depends from the bottom of the housing and has an upstanding flange 7 at its front end for holding a cigarette in the chute, said front end being open so that a person can pick up a cigarette by placing a portion of his hand in the front opening and seizing the cigarette resting against the flange 7.

The hopper or magazine B for the cigarettes is composed of the vertically arranged side plates 8, supported in spaced relation from the rear plate 1 by means of the brackets 9, the rear frame composed of the cross piece 10, and the wires 11, and the front frame composed of the vertical and cross wires 12, two of the cross wires being arranged in parallel relation at the bottom end of the front portion and spaced apart to form guiding means for the bottom plate-like member 13 of the hopper. This member is slidably arranged between said pair of wires and also slides on a large wire or rod 12' which extends across an intermediate part of the bottom of the magazine. Bars 12'' are connected with the under part of the member 13 and have their major portions spaced from the under face of said member and form guideways for guiding the member 13 in its movement on the rod 12'. A channeled part 13' is formed in the rear part of the member 13, and said channeled part has a transverse slot 14 therein for receiving a portion of a lever 15 having its rear end bent upwardly and to which is fastened a lifter member 16 which is of elongated form and has a concaved upper face for receiving a cigarette. A U-shaped member 17 has its limbs pivoted to the outer faces of the side plates 8 of the magazine, as shown at 18, and the bight 17' of this member is connected by the bars 19 with the bottom of the channeled part 13' of the bottom plate 13, so that when this U-shaped member is swung on its pivot, the bottom plate 13 is moved back and forth under the magazine.

The lever 15 is pivoted to the bight 17' by an eye 15' formed on the lever and through which the bight passes. The pivoted end of the lever has an upstanding part 15'' thereon which will engage the wire or rod 12' upon rearward movement of the parts and this will cause the lever 15 to swing upwardly, carrying the member 16 upwardly out of the channeled part, after the channeled part passes rearwardly of the magazine, as shown in Figure 6. A spring 20 normally holds the lever 15 in lowered position with the member 16 in the bottom of the channeled part 13'. An angle-shaped hand lever 21 (see Figure 8), is pivoted, as at 22 (see Figure 3), to the

outer face of one of the side plates 8 and has a part passing through a slot, part of which is formed in the door 2 and another part in the front of the housing. This lever is normally held against a stop 24 fastened to said side plate, by a spring 25, and the lower end of said lever is formed with a groove 26 for receiving the upper end of one of the limbs of the U-shaped member 17, as shown in Figure 11. This end of the said limb extends upwardly beyond the pivotal point so that when the handle or projecting end of the lever 21 is pressed upwardly, the grooved end will engage said projecting end of the limb and cause the U-shaped member to swing rearwardly, which will, of course, move the bottom plate 13 rearwardly, and as one of the cigarettes in the magazine is located in the channeled member, said cigarette is moved to the rear of the magazine and then the lever 15 is raised by its ends 15' engaging the bar 12', so that the member 16 lifts the cigarette to the position shown in Figure 6. After the parts have moved to a certain extent, or to the position shown in Figure 6, the lower end of the lever 21 rides off of the end of the limb of the U-shaped member and then a spring 27 will return the parts to their normal position. This spring is shown in Figure 4 and is of strip form and has one end connected to the opposite limb of the U-shaped member and its other end is suitably connected to a side plate of the magazine, as shown at 28. After the hand lever 21 is released, the spring 25 will return it to a position in rear of the upper end of the limb of the U-shaped member, as shown in Figure 3, the rounded construction of the parts permitting said parts to pass each other and the stop 24 is recessed to properly position the lower end of the lever 21 in rear of the upper end of the limb of the U-shaped member 17.

A bracket 29 is supported on the upper part of the rear plate 1 and a spring of leaf form and shown at 30 is connected with the bracket. An angle-shaped armature forming member 31 has one limb connected with the spring and a rod 32 has its upper end connected with the other arm of the member 31, the lower portion of the rod being of tubular form to provide the bore 32' and a vacuum cup 33 is connected with the lower end of the rod, as shown more particularly in Figure 9. This cup extends horizontally and is located adjacent one end of a cigarette when the cigarette has been lifted by the member 16 to the position shown in Figure 6. A hollow member 34 is attached to the plate 1 and said member has its interior in communication with a port 35 opening out through its front face, and this port is normally closed by a slide 36 on the rod 32, and the upper end of the bore 32' of the rod opens out through the rear face of the rod, as shown in Figure 7, and these parts are so arranged that as the rod 32 swings to the left in Figure 2, the upper end of the bore 32' will come into register with the port 35 and thus the bore will be in communication with the hollow member, which is connected by a tube 37 with suitable vacuum producing means, such as the inlet of the engine of a motor vehicle, if the device is used on such a vehicle.

When the U-shaped member 17 is swung by the hand lever 21, in its final movement it will engage an insulated contact 40 and thus ground the coil 41 of a double magnet 42 which is electrically connected to a battery X, as shown in Figure 1. When the coil 41 of the magnet is energized in this manner, the armature 31 will

be attracted thereby so that the member 32 will be swung over into a position where the cup will engage an end of a cigarette, as shown in Figure 9, and the cup will be placed in communication with the vacuum producing means. At the same time a contact 31' on the armature will engage the contact 43 connected with the core of the magnet and as the armature is carried by a part of the metallic frame which is electrically connected with the battery, current will flow from these parts through the conductor 44 to the igniter coil 45 which is carried by the tubular member 46 of non-conducting material supported from the bracket 9' extending from the frame 1. This coil 45 is placed adjacent the opposite end of the cigarette from that engaged by the vacuum cup and when the member 32, with the cup, is swung to the left in Figure 2, the cigarette will be pushed against the coil 45 and as a suction is acting on the opposite end of the cigarette, said cigarette will be quickly ignited. A thermostatic strip 47 is supported by the bracket 9' and lies adjacent the coil 45 so that it will be affected by the heat from the coil, which draws the strip away from the adjustable contact 48 which is grounded, as shown at 49. Thus after the coil 45 becomes heated to a certain degree, the heat will cause the strip 47 to move away from the contact 48 and thus the circuit will be broken and the parts will return to their normal position. A stop pin 50 limits outward movement of the rod 32 by the spring 32; and it will be seen that after the member 17 engages the contact 40, the hand lever 21 will have its lower end ride off of the upper end of one of the limbs of the member 17, so that the spring 27 will return said member 17 to normal position with the trough or channeled part 13' of the plate 13 in receiving position under the magazine and, of course, this return movement breaks the circuit to the coil 41, but as the armature has been drawn to the left in Figure 1, which closes the circuit to the igniter coil 45, as well as to the second coil 51 of the magnet, the circuit to the coil 45 remains unbroken until it is broken by the thermostatic strip 47 moving away from the contact 48.

After the cigarette has been lighted and the circuits are broken, the cigarette will drop into the chute 6, where it can be picked up.

A lamp 52 is supported in a socket 53 on the plate 1 under the window 4 and this lamp is connected by the conductors 54 with the circuit of the coil 45, so as to indicate that the cigarette is being lighted.

A lamp 55 is located in the casing in rear of the window 5 and has a conductor 56 connected therewith, which forms one member of a switch, the other member 57 being carried by a bent end of a rod 58 pivoted at its upper end on one of the bars 12, with said rod extending into the magazine. The part which carries the portion 57 of the switch is heavier than the other portion so that the major portion of the rod tends to swing into the magazine, but is held against this movement as long as there are cigarettes in the magazine. However, when the magazine is empty or almost so, the rod 58 will swing into the magazine, thus closing the switch parts 56 and 57, so as to complete the circuit to the lamp 55, which will indicate that other cigarettes should be placed in the magazine. As shown in Figure 1, the lamp 55 is grounded and connected to the conductor 44 by the conductor 54'.

From the foregoing it will be seen that when one wishes a cigarette, he pushes upwardly the

projecting end of the lever 21, which causes the lever to swing the U-shaped member 17 so as to operate the bottom member 13, which takes a cigarette from the bottom of the magazine to a position in rear of said magazine and then the cigarette is lifted into horizontal alignment with the vacuum cup and the igniter coil 45 by the member 16 being raised by the lever 15 having its part 15' engaging the cross bar 12'. This movement causes a portion of the U-shaped member 17 to engage the contact 40, thus closing the circuit to the magnet 42, which attracts the armature 31 and swings the member 32 to the left so that the vacuum cup will engage one end of the cigarette and push the other end against the igniter coil 45. Then suction occurs in the cup, which draws air through the cigarette and causes the end in contact with the igniter coil to ignite. Then the member 17 moves back into its original position while the other coil of the magnet acts to hold the armature and the member 32 in operative position with the current passing through the igniter coil 45. This continues until the heat from the coil causes the member 47 to move away from the contact 43, which breaks the circuit to all the parts and permits said parts to return to their original position, the lighted cigarette dropping into the chute 6 where it can be picked up by the operator of the device or any other person. The lamp 52 is ignited when the coil 45 lights the cigarette, and when the magazine becomes empty or almost so, the lamp 55 is ignited, upon operation of the parts, so as to indicate that the magazine should be refilled with cigarettes.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. A device of the class described comprising a casing, a magazine for cigarettes in the casing, an arm supported for swinging movement in the casing and having a bore in a part thereof, a chamber forming member in the casing and connected with a vacuum producing means and said chamber forming member having a port therein, a projection on the arm normally covering the port and the arm having a port therein in communication with the bore and communicating with the first port when the arm is swung from its normal position, means for holding the arm in said normal position, a vacuum cup carried by the arm and in communication with the bore of the arm, an igniter coil supported in the casing in alignment with the cup, manually operated means for moving a cigarette from the magazine and placing it between the cup and coil, magnetic means including a circuit for moving the arm to position the cup against one end of the cigarette to force the other end against the coil and such movement of the arm connecting the cup with the vacuum producing means, means for closing the circuit of the magnetic means by the operation of the manually operated means, a second circuit including the coil and magnetic means and means for breaking the second circuit by the heat from the igniter coil.

2. A device of the class described comprising a casing, a magazine for cigarettes in the casing, a hand lever having a part extending from the

casing, means operated by the lever for moving a cigarette from the magazine to a position to one side of the magazine, a vacuum cup, a movable support in the casing for the cup, an igniter coil supported in the casing in alignment with the cup, the cigarette moving means positioning the cigarette between the cup and the coil, magnetic means including a circuit closed by the operation of the aforesaid means, for moving the cup against one end of the cigarette to push the other end against the coil, a second circuit including the coil and magnetic means closed by such movement of the suction cup, means for placing said cup in communication with vacuum producing means when it is moved by the magnetic means, means for moving the first means to normal position to release a cigarette after the magnetic circuit has been closed, means for breaking the second circuit by the heat from the coil, spring means for returning the suction cup to normal position to release the cigarette, and a member below the casing for receiving the cigarette.

3. In a device of the class described, a casing, a magazine for cigarettes in the casing, a slidable bottom piece for the magazine having a channeled part for receiving one cigarette from the magazine, a member for shifting the bottom member rearwardly, a hand lever for operating said member, means for raising the cigarette at the end of the rearward movement of the bottom member, a vacuum cup, a movable support for the cup, an igniter coil supported in the casing in alignment with the cup and the lifting means positioning a cigarette between the cup and said coil, magnetic means, including a circuit closed by the rearward movement of the bottom operating member for moving the cup into engagement with one end of the cigarette to force its other end against the igniter coil, means for connecting the cup to a vacuum producing device at the end of such movement, spring means for holding the cup against such movement, a second circuit including the coil and magnetic means, means for closing such circuit as the suction cup swings to operative position, and means for breaking said circuit by the heat from the igniter coil.

4. In a device of the class described, a casing, a magazine for cigarettes in the casing, a slidable bottom piece for the magazine having a channel part for receiving one cigarette from the magazine, a lever member pivoted to the magazine and connected with the bottom piece for actuating said bottom piece, a hand lever pivoted in the casing and having a part projecting therefrom and a second part for engaging a portion of the lever member to cause said lever member to move the bottom piece rearwardly, after which the hand lever frees itself from the lever member, means for raising the cigarette at the end of the rearward movement of the bottom piece, a vacuum cup, a movable support for the same, an igniter coil supported in the casing in alignment with the cup, said cup and coil being located in rear of the magazine and the lifting means positioning a cigarette between the cup and coil, magnetic means including a circuit closed by the rearward movement of the lever member for moving the cup supporting means for moving the cup into engagement with one end of the cigarette to press its other end against the coil, said cup supporting member having a bore therein in communication with the cup, means for connecting said bore to a vacuum pro-

5 ducing device as the cup engages the end of the cigarette, spring means for holding the cup supporting member with the cup spaced from the end of the cigarette, a second circuit for the ignition coil said second circuit including the magnetic means, means for closing said second circuit by the movement of the cup supporting

member to position the cup against the end of the cigarette, means for breaking said second circuit by the heat from the ignition coil and means at the bottom of the casing for receiving the cigarette after it has been released by the suction cup. 5

FRANK M. FERGUSON.