

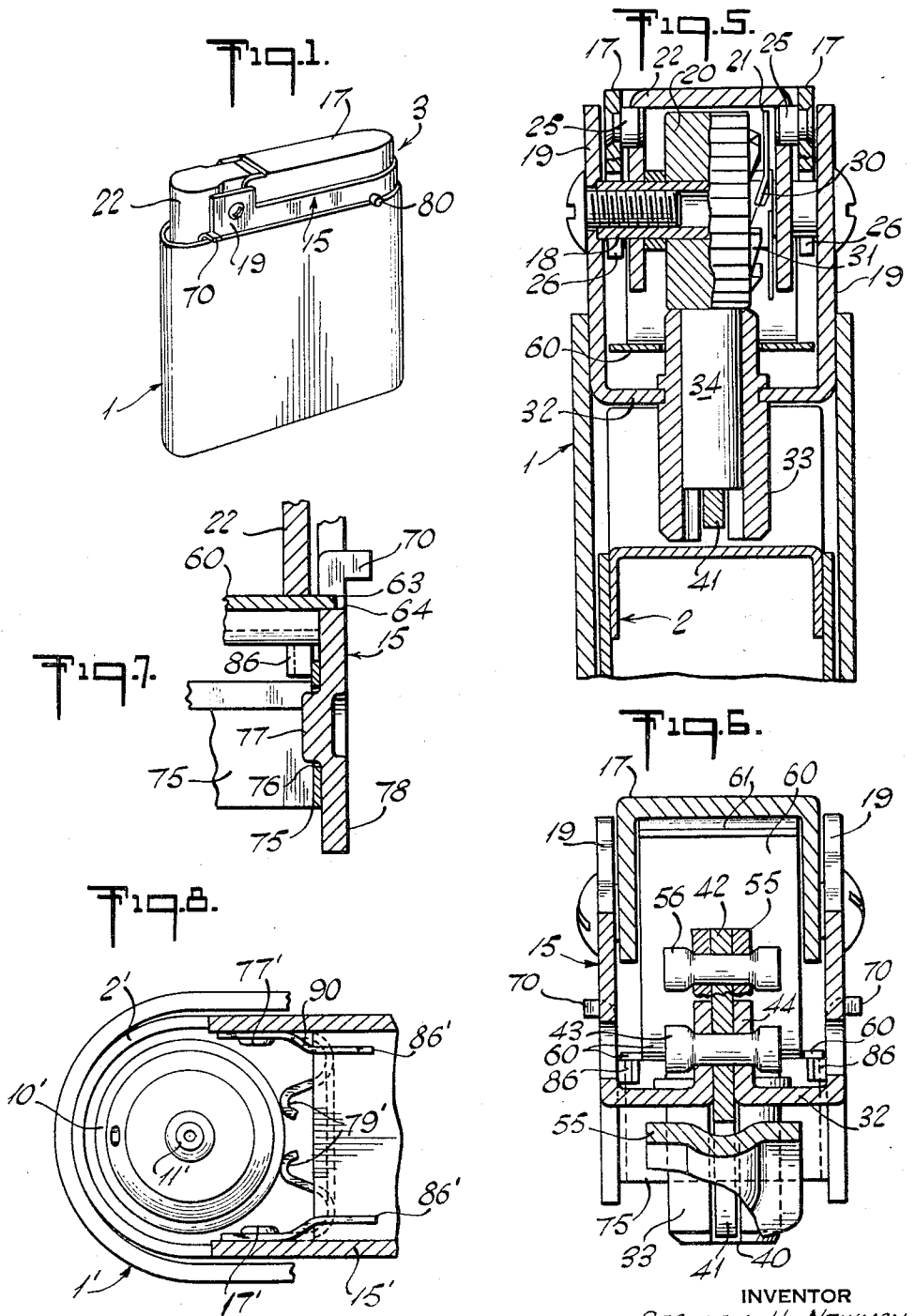
July 5, 1960

S. H. NEWMAN
CIGARETTE LIGHTER

2,943,471

Filed May 31, 1957

3 Sheets-Sheet 1



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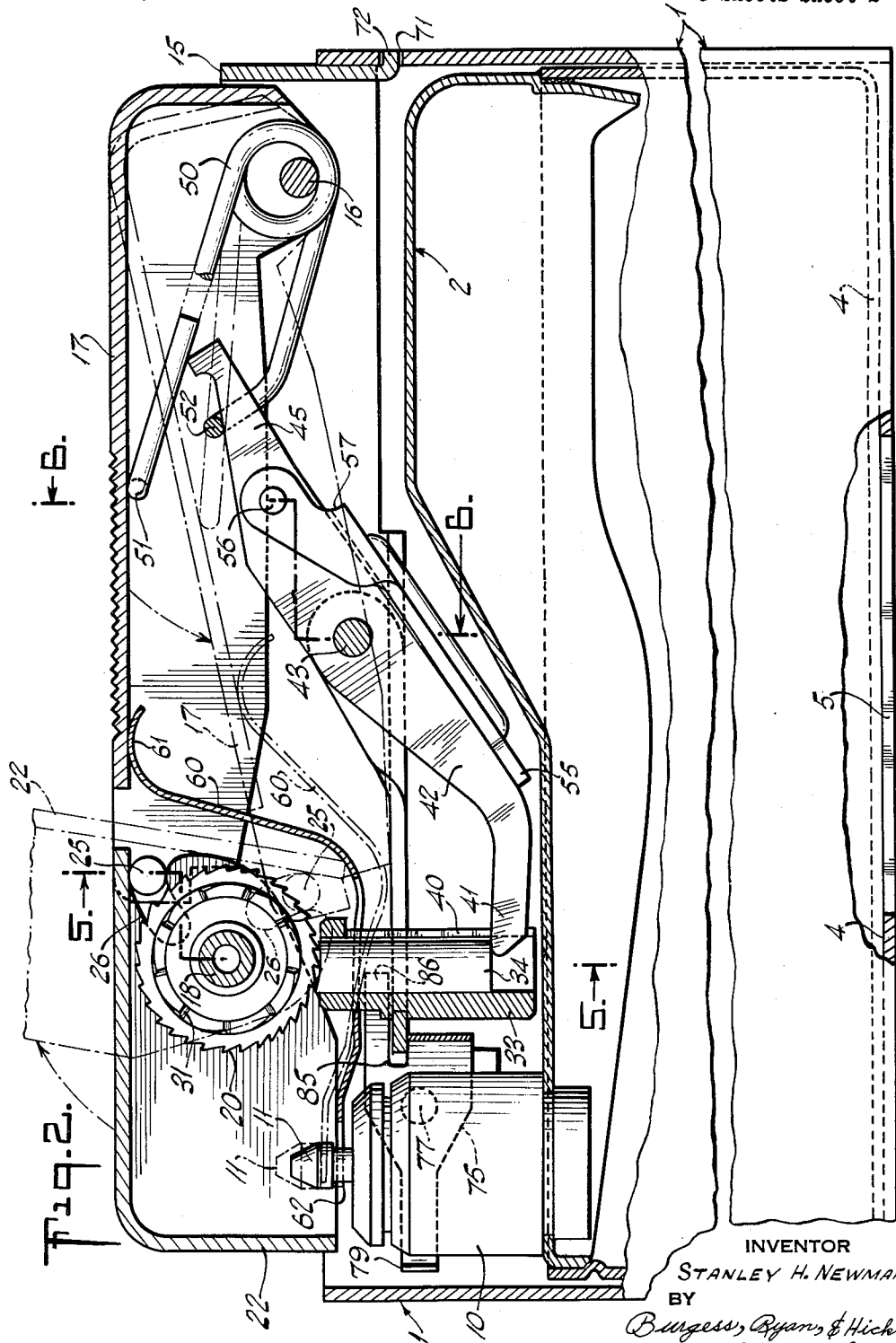
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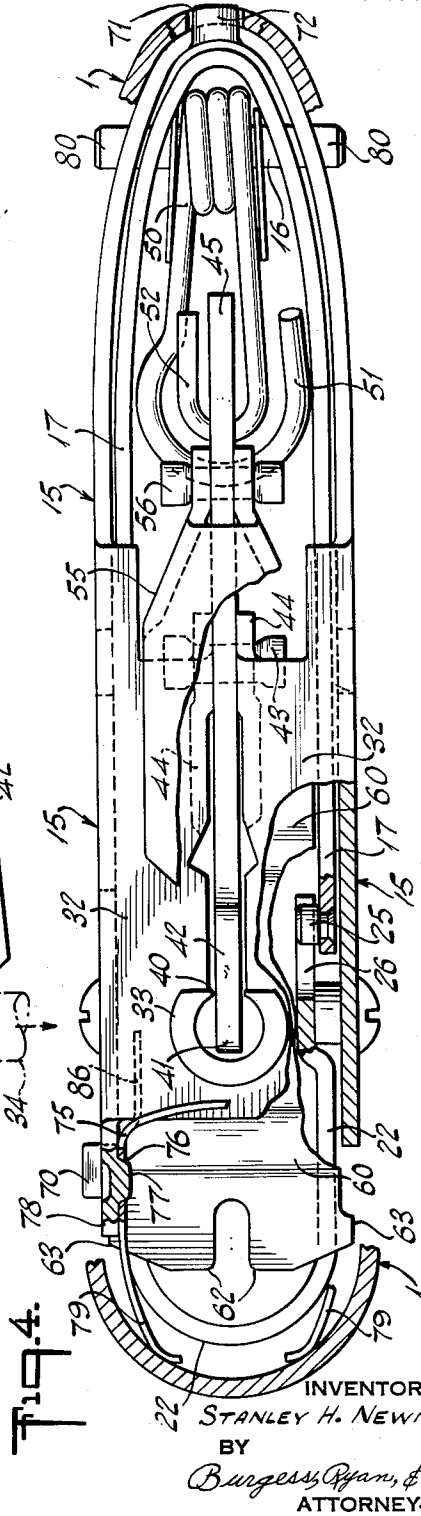
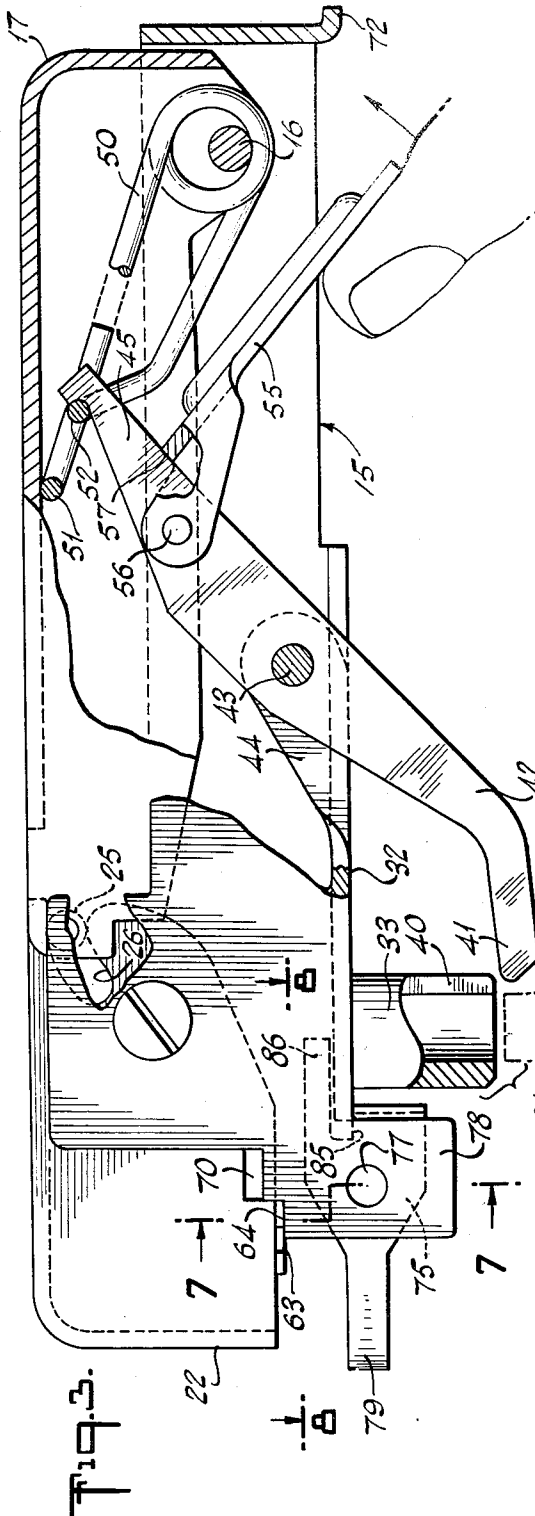
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CIGARETTE LIGHTER

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Filed May 31, 1957, Ser. No. 662,783

Claims priority, application France June 29, 1956

2 Claims. (Cl. 67-7.1)

This invention relates to cigarette lighters and has for its object to simplify manufacturing and assembly operations and at the time provide a construction of improved reliability.

For the purposes of illustration the various features are shown incorporated in a so-called gas lighter, that is, a lighter using a compressed gas fuel such as butane. While not limited thereto, the invention will be recognized later as being of special utility in connection with pocket and other lighters of that type.

The invention will be readily understood from the following description of the accompanying drawings, in which:

Fig. 1 is a perspective view of an assembled pocket lighter incorporating the invention;

Fig. 2 is a broken, central vertical section, on an enlarged scale, of the lighter of Fig. 1;

Fig. 3 is a side view of the head unit of the lighter, with parts broken out for clearness of illustration;

Fig. 4 is a bottom plan view of the head unit;

Fig. 5 is a transverse vertical section on the line 5-5 of Fig. 2;

Fig. 6 is a transverse fragmentary section on the line 6-6 of Fig. 2;

Fig. 7 is an enlarged detail; and

Fig. 8 is a top plan view of a modification.

In this preferred embodiment the lighter consists of three readily assembled components: a case 1, a fuel tank or container 2 and a head unit 3.

The case has an open top through which the more or less snugly fitting fuel tank can be inserted and the bottom wall 4 of the case has a restricted opening or slot 5 to receive a tool (a coin, for example) for readily ejecting the fuel tank which telescopes into the case far enough below the top to leave room for the attachment of the head unit.

The illustrated fuel tank is a throw-away unit; that is, when the fuel supply is exhausted, it is discarded and a new tank inserted. The tank incorporates a burner-valve assembly including a valve body 10 and a burner jet 11. The construction of the valve interior forms no part of the present invention and for present purposes it need only be understood that the headed upper end of the burner jet serves also as a gas release valve, raising the head relatively to the body serving to permit the escape of gas from the tank at the jet, where it is ignited by any appropriate means, such as the spark mechanism below described. In this form the tank can be assumed to contain butane gas under pressure.

The head or cover unit, which is bodily removable, not only constitutes a closure for the upper end of the case but incorporates the entire igniter mechanism, including an actuator for the gas valve. In other words, by the simple act of inserting the head, the valve actuator is properly associated with the valve on the gas tank and the lighter made ready for immediate use. Before describing the head unit in detail it may be noted further that the mechanism includes a finger piece adapted to be manually depressed to effect, coincidentally, the raising of a snuffer, the rotation of a spark wheel and the lifting of the gas valve.

The head unit, which is elongated in conformity with the shape (in plan) of the case, consists primarily of a

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body shell 15 having a cross shaft 16 disposed adjacent what will be termed the rear end of the unit. A finger piece 17 which comprises the actuator for the lighter is pivoted on this shaft and on a second cross shaft 18, which extends between the upstanding ears 19 of the body shell adjacent the forward end of the head unit, are rotatably mounted a spark wheel 20, a one-way drive plate 21 for rotating the spark wheel and a snuffer 22 for rotating the drive plate, the snuffer being rotated by the finger piece.

The free forward end of the finger piece carries two studs 25 which engage in slots 26 in the side walls of the snuffer so that, when the finger piece is pressed downwardly and rotated about shaft 16, the snuffer is caused to rotate about its shaft 18 into its Fig. 2 dotted line position. This movement of the snuffer can be applied in any conventional or suitable manner to effect the rotation of the spark wheel. For purposes of illustration, there is shown a drive plate 21 which may be secured to or otherwise suitably coupled for rotation with the snuffer, the drive plate incorporating a spring pawl 30 for one-way driving engagement with teeth 31 formed on the adjacent side face of the spark wheel.

The body shell 15 of the head unit has interned flanges 32 and projecting through and brazed to these flanges is a flint holder or tube 33. As will be seen, a flint 34 in the tube is positioned with its upper end abutting the lower surface of the spark wheel. As will now be described, means are provided for progressively increasing the frictional engagement of the flint with the spark wheel coincidentally with the rotation of the sparking wheel, which arrangement contributes to the reliable striking of a good spark in the direction of the burner (or gas jet in this instance). This is accomplished by providing suitable spring means disposed with one end engaging and opposing downward movement of the finger-piece and its other end disposed in sustaining relationship to the flint.

The flint tube is slotted, as at 40, to receive the forward end 41 of a flint holding lever 42 which is pivoted on a stud 43 carried by the ears 44 of the body shell flanges 32. As will be apparent, upward movement of the end 41 of the flint holding lever urges the flint into engagement with the spark wheel. The rear or other end 45 of lever 42 extends back towards the pivot shaft 16 of the finger piece and on that shaft is supported a so-called pigtail or torsion spring 50. One free end 51 of the spring engages the under side of the finger piece and the other free end 52 is hooked over the rear end 45 of the flint holding lever. At will be understood, spring 50 has a set such that its free ends tend to spread apart, so that the rear end of lever 42 is constantly biased downwardly and its forward end upwardly. It will thus be apparent that depression of the finger piece (that is, movement of it in the direction to rotate the spark wheel) increases the spring tension which is transmitted, through the other end of the spring and lever 42, to thrust the flint more firmly against the spark wheel. In addition, of course, the spring serves to restore the finger piece to its normal, inactive position. This dual-purpose single spring represents both an economy and a simplification of assembly.

Means are provided for compressing spring 50 and freeing the forward end of lever 42 from the flint tube to facilitate insertion of a new flint when that is required. In this preferred form, such means comprises a manual flint release lever 55 which is pivotally mounted at 56 on the flint holding lever. The pivot end of release lever 55 has bent ears 56 formed to embrace and frictionally engage the sides of flint holding lever 42. Normally, the release lever is folded to engage and lie along the holding lever (as shown in Fig. 2). When it is desired to replace

a flint, release lever 55 is swung about its own pivot (counter-clockwise as viewed in Fig. 2) until the end portion 57 engages the holding lever. Then, by the application of pressure to the release lever, the holding lever is caused to rotate, against the action of spring 50, to swing the flint supporting end 41 of the holding lever downwardly and out of the flint tube slot, thereby clearing the way for the stub end of the old flint to be dropped out and a new flint inserted.

In this preferred form and as mentioned above, the removable head unit incorporates an actuator for the gas valve, so that the single operation of depressing the finger piece releases the gas, raises the snuffer and strikes the spark to ignite the gas issuing from the burner jet.

This valve actuator is shown as consisting of a single piece 60 of suitably shaped spring steel extending lengthwise of the body shell, with an intermediate hole dimensioned to permit the spring to be passed down over the flint tube. Its elevated rear end 61 engages the under side of the finger piece and its forward end 62, which is forked to slide beneath the headed upper end of the combined burner jet and valve, projects forwardly of the head unit beneath the snuffer. The spring is given a set such that its forward end is biased upwardly but the upward thrust of end 51 of spring 50 against the finger piece (transmitted by studs 25 to and effecting a downward movement of the snuffer) is sufficient to overcome the bias of spring 60, so that its forward end is normally held down by the snuffer. The forward edge portions or ears 63 of spring 60 seat on the top edge surfaces 64 of the body shell, such surfaces thus serving as seats for the spring 60 and as stops to limit the downward movement of the snuffer.

When the finger piece is depressed and the snuffer thereby raised, the bias of spring 60 is free to raise its forward end in the direction to open the fuel valve. This action of the forward end of spring 60 is reinforced by the downward movement of the rear end of the spring by the provision of a support, in the nature of a fulcrum, carried by the body shell and located to engage the underside of an intermediate portion of the spring or actuator 60, as described below.

The head or mechanism unit is so organized and dimensioned and the components of it so arranged as to permit the unit to be slid and telescoped into the upper end of the case; and readily releasable means are provided for interlocking the head unit to and rendering it detachable from the case.

The head unit is of a length somewhat less than the width of the case and stop means are provided for limiting the movement of the forward end of the head unit into the case to a depth appropriate to position the valve actuator correctly in relation to the valve. As illustrated, these stop means comprise the ears or lugs 70 outwardly bent from the body shell and dimensioned to seat on the top edges of the case.

By reason of this construction, it will be seen that the forward end of the head unit may be inserted in the case to the depth permitted by the ears 70 and then slid toward the valve to engage the actuator beneath the valve head. Then the rear end of the unit may be lowered into the case.

The rear end wall of the case is provided with an opening 71 to receive a latch piece 72 projecting from the rear end of the head unit body shell 15 and spring means are provided for maintaining the latch piece engaged with the case opening. In the form illustrated in Figs. 1-7 these means comprise a U-shaped spring steel piece 75 having side holes 76 to locate it on the bosses 77 which are struck inwardly from the depending body shell portions 78. The element 75 has projecting spring fingers 79 the forward curved ends of which are adapted to engage the case wall. It will be seen that, as the head unit is slid forwardly to engage the actuator beneath the valve head, as above described, the spring fingers will yield and then, after the rear end of the unit has been lowered into the

case, the spring fingers will urge the head unit rearwardly to engage the latch piece and maintain it engaged with the case opening. The projecting ends 80 of the cross shaft 16 serve to limit the telescoping movement of the rear end of the head unit into the case to a depth appropriate to position the latch piece opposite the case opening. To remove the head unit, it is simply necessary to push the rear end forwardly (compressing the front end springs and disengaging the latch) and then upwardly, whereupon it can be slid backwards to disengage the valve actuator from beneath the valve head.

In this particular form, the spring element 75 is notched at 85 to engage the forward ends of the body shell flanges and is provided with projections 86 which provide the intermediate fulcrum support (mentioned above) for the valve lifter spring and about which it is flexed when its rear end is depressed by the finger piece (see Fig. 2).

Fig. 8 illustrates a modified spring arrangement for urging the head rearwardly as and for the purposes above described. In this arrangement there is a somewhat similar spring piece 90 likewise apertured to engage it with corresponding bosses 77' and has corresponding projections 86'. In this instance, however, the spring fingers 79' are disposed to engage the body of the gas valve rather than the case itself. These spring means will be seen to serve the same purposes as those above described but, in addition, they urge the fuel tank toward the forward end of the case so that, should there be any play between the case and tank, the latter will be held against rattling in the case.

This application is a continuation-in-part of application Serial No. 649,510, filed March 29, 1957, now abandoned.

In the light of the foregoing exemplification of the principles of the invention, the following is claimed:

1. A cigarette lighter comprising the combination with an open top case of a mechanism head unit dimensioned to telescope into the open top of the case and incorporating a snuffer adjacent its forward end and a valve lifter having a forked end disposed beneath the snuffer, a fuel supply in the case having an upstanding lifter type valve at said forward end of the case, stop means for limiting the entry of the forward end of the head unit into the case to a depth to position the valve lifter for engagement with the valve when the said forward end of the head unit is inserted into the case to said depth and slid endwise in the direction of its forward end, and latch means for interlocking the head unit and case.

2. In a cigarette lighter of the kind including a compressed gas fuel tank having an upstanding valve jet adapted to be raised relatively to the tank to discharge gas therefrom and a snuffer pivotally mounted above the valve jet for downward movement to cover and upward movement to expose the valve jet, the improvement which comprises: a leaf spring valve jet lifter engaged with the valve jet and biased to raise the same, a snuffer spring biased to move the snuffer downward, the leaf spring being located beneath the snuffer for engagement thereby to flex and hold the valve lifter down in response to said downward movement of the snuffer under the influence of the said snuffer spring.

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