Dec. 19, 1939. R. B. BASS 2,183,706

LIGHTER

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Fig. 1.

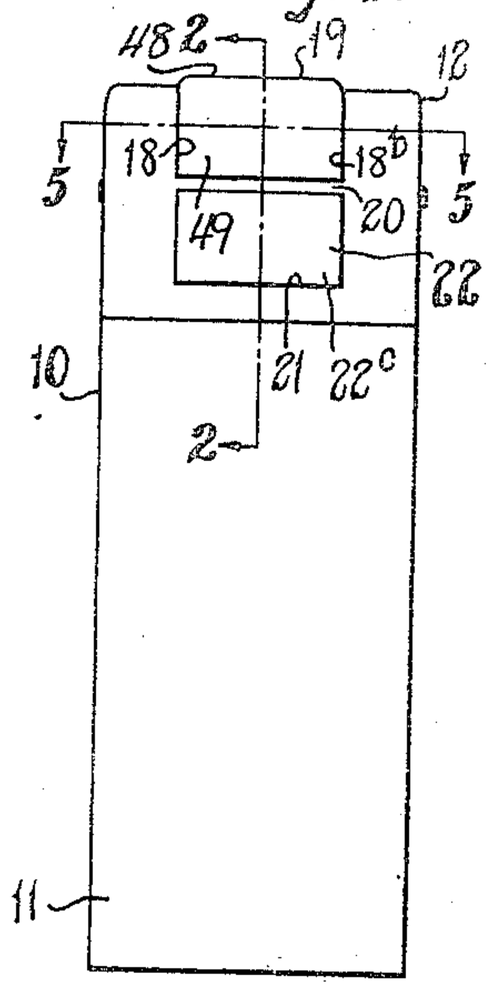


Fig. 2.

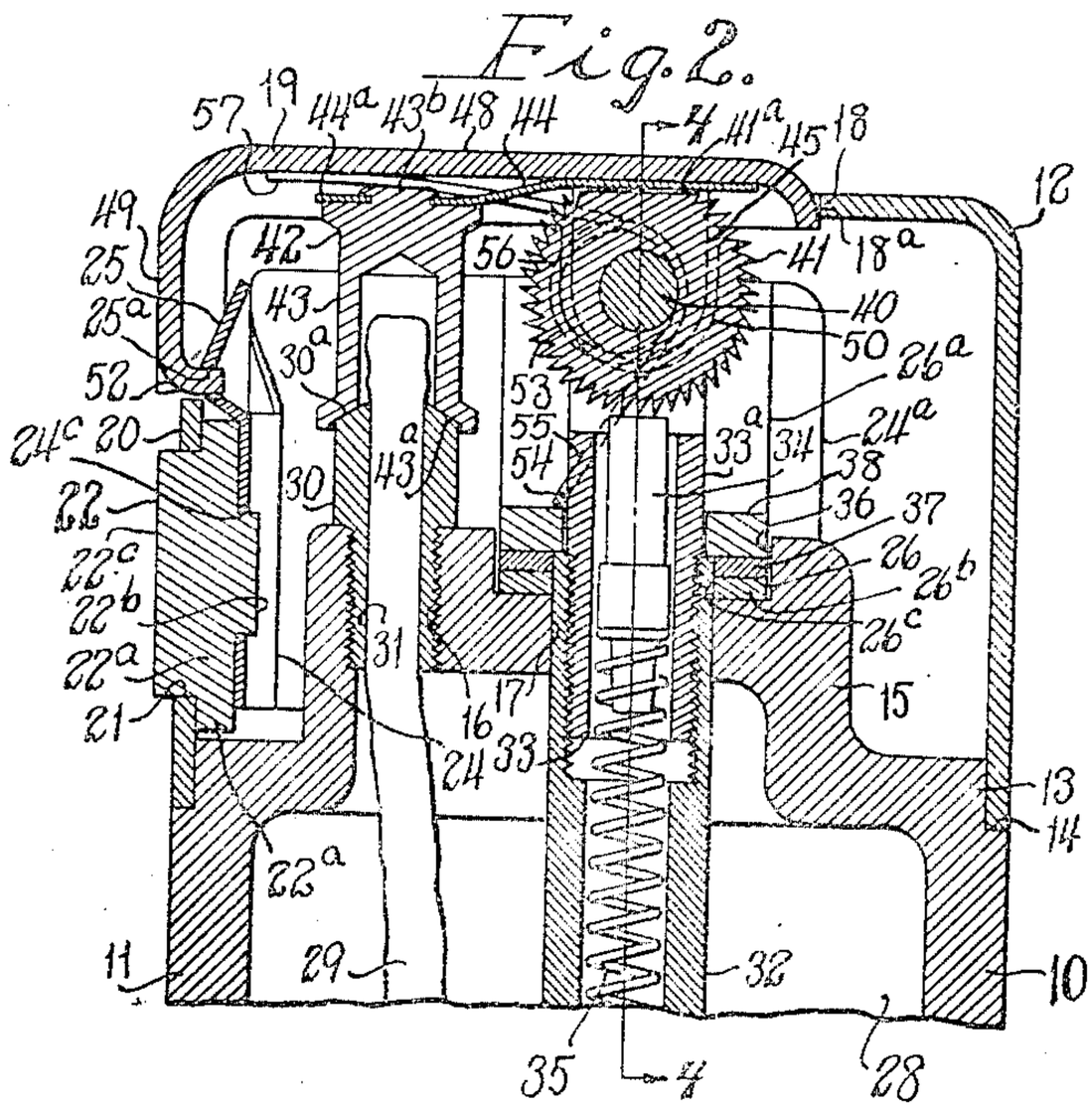


Fig. 3.

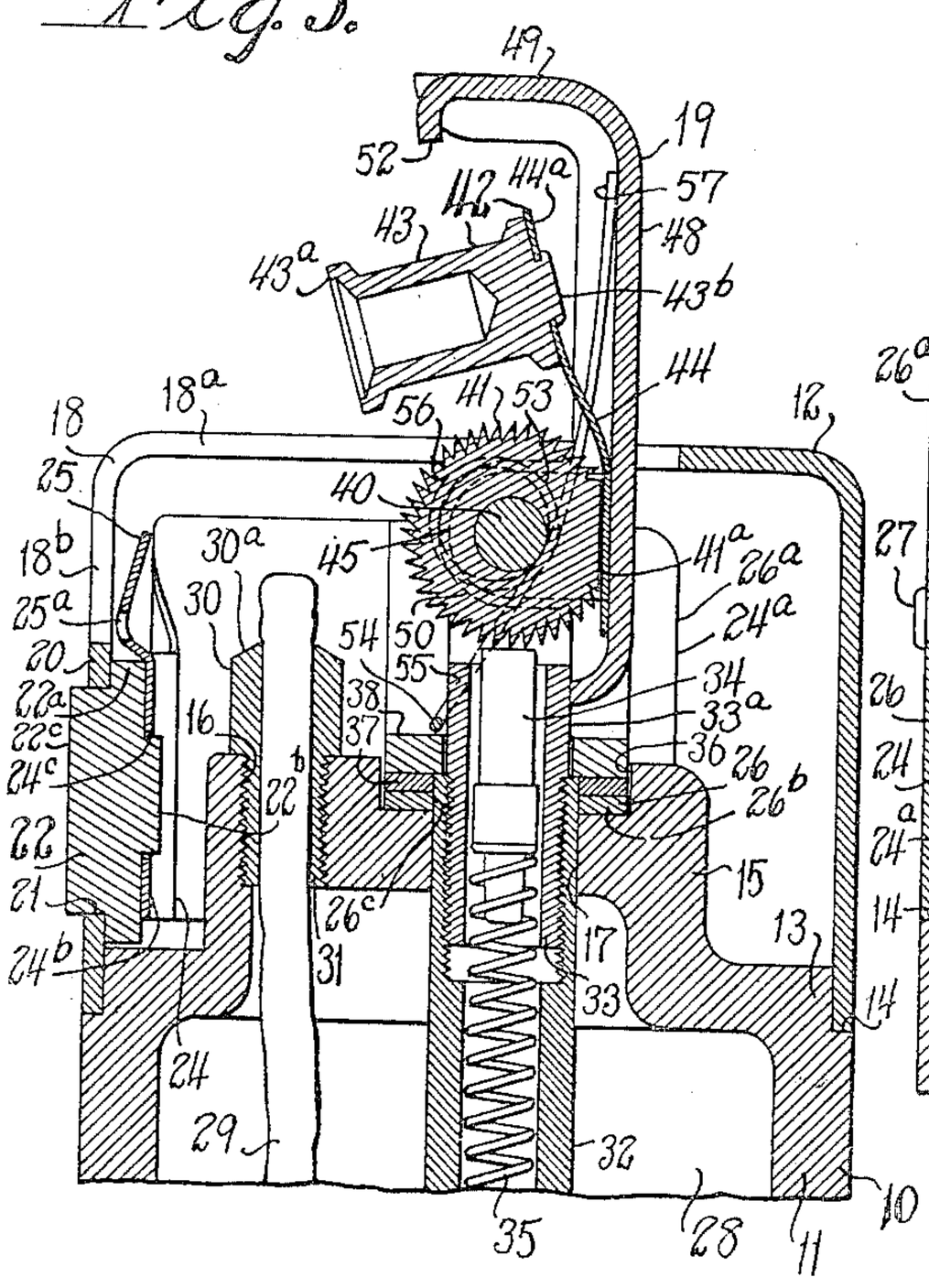
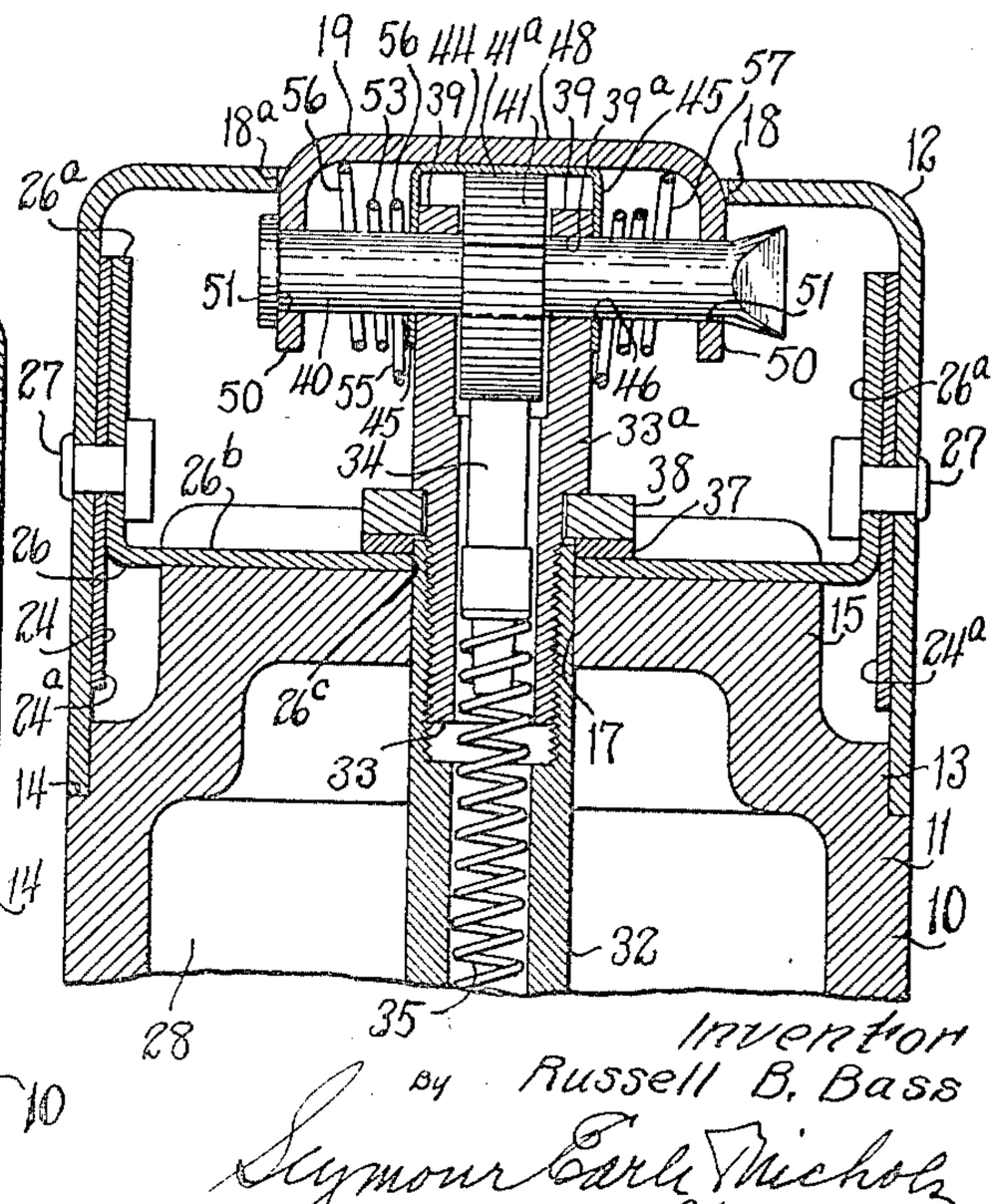


Fig. 4.



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LIGHTER

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Fig. 5.

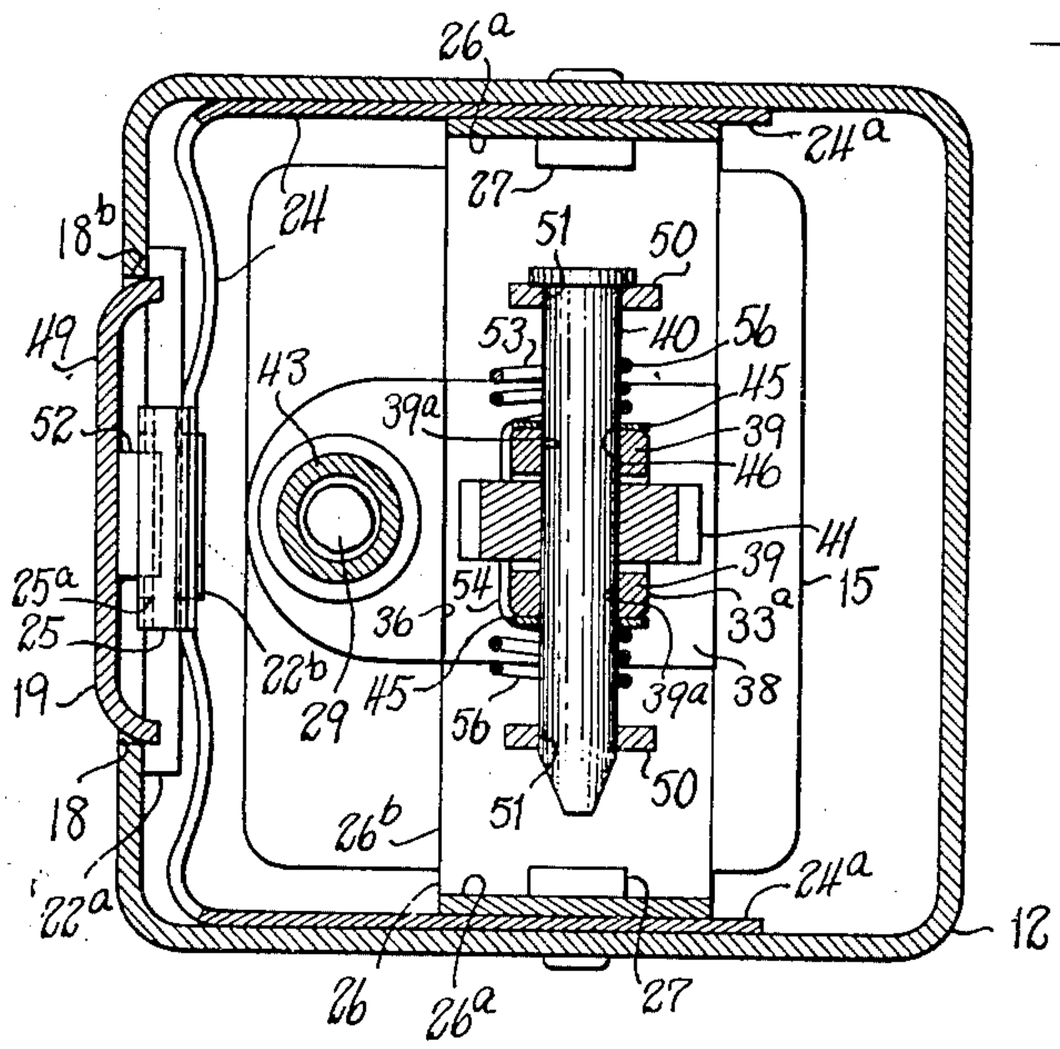


Fig. 6.

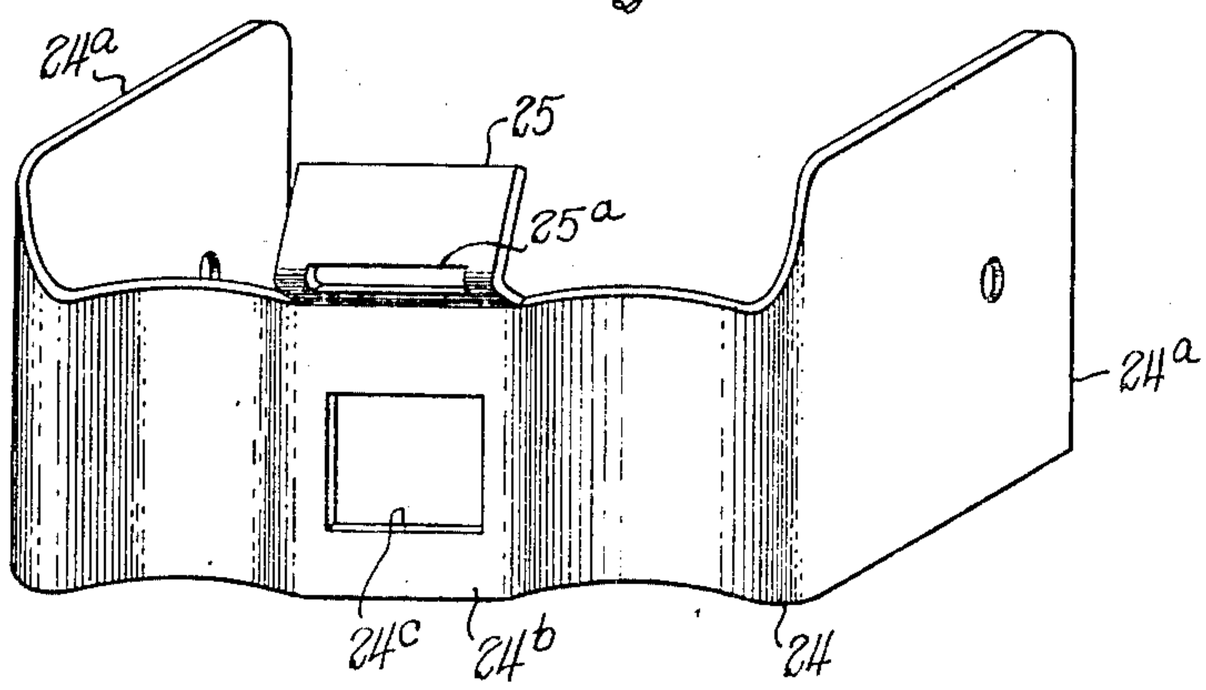


Fig. 8.

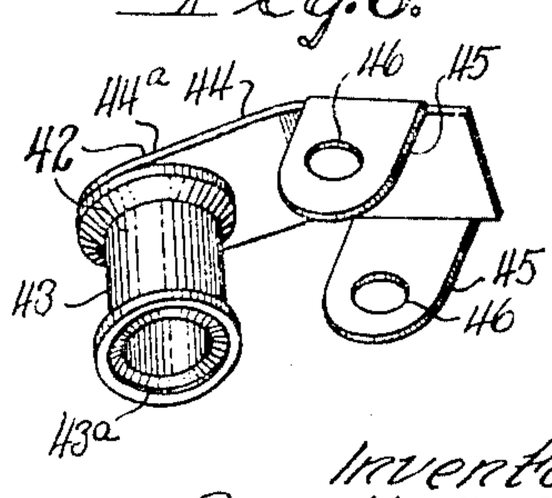
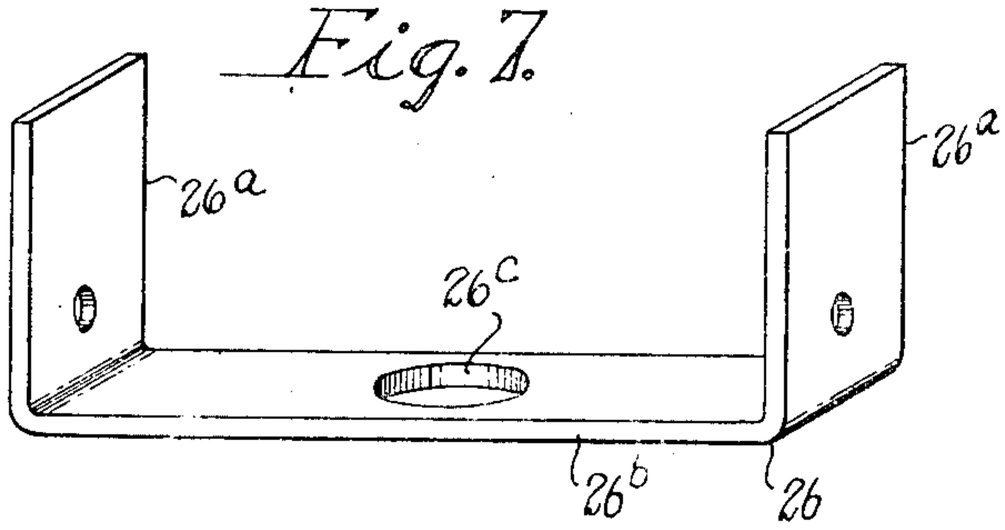


Fig. 7.



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Patented Dec. 19, 1939

2,183,706

UNITED STATES PATENT OFFICE

2,183,706

LIGHTER

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Application May 11, 1938, Serial No. 207,212

6 Claims. (Cl. 67—7.1)

This invention relates to an improved lighter used for lighting cigarettes and cigars, and is particularly directed to improvements in a lighter of the automatic type, in which, upon release of a closure-member, the closure-member is caused to swing by means of a tensioned element, and in swinging causes the operation of flame-producing mechanism.

One of the objects of the present invention is to provide a lighter in which the parts are arranged in close relationship and operate in a small substantially-confined space, whereby the operation of the flame-producing means is improved and the likelihood of inadvertent extinguishing of flame is lessened.

Another object of this invention is to provide a lighter, as described, with a separate snuffer-unit, which when operated by the opening swinging movement of a closure-member will be moved to a position providing ample flame space, but closely adjacent to the wick in position to quickly carry out its extinguishing function.

A further object of the invention is to provide a lighter, as described, which is operable to provide an improved seating arrangement of a wick-cap on a wick-tube to avoid evaporation and drying-out of the wick, and to thereby improve the operation of the apparatus.

A still further object of the invention is to provide a lighter in which by novel construction and arrangement of parts, a substantially-simplified and compact structure is secured, and economies of manufacture are effected.

With the above and other objects in view, as will appear to those skilled in the art from the present disclosure, this invention includes all features in the said disclosure which are novel over the prior art.

In the accompanying drawings, in which certain modes of carrying out the present invention are shown for illustrative purposes:

Fig. 1 is a front elevation of a lighter of the table type, the lighter being illustrated in closed position;

Fig. 2 is a broken vertical sectional view of the upper part of the lighter, taken on the line 2—2 of Fig. 1;

Fig. 3 is a similar view showing the parts in the positions which they assume when the closure-member is in its open position;

Fig. 4 is a broken vertical sectional view, taken on line 4—4 of Fig. 2;

Fig. 5 is a transverse sectional view taken on the line 5—5 of Fig. 1;

Fig. 6 is a perspective view of the U-shaped securing-member;

Fig. 7 is a similar view of the U-shaped hood-attaching member; and

Fig. 8 is a perspective view of the snuffer-unit.

The improvements in lighter construction to which this invention relates may be applied to a lighter of the table type or of the pocket class, as will be clear from the drawings and as will become more apparent as the description proceeds.

In a device of the character described, which is designed for personal use, it is desirable that the number of parts be few; that the construction be devoid of complicated arrangements and as free as possible of exposed parts. With regard to functional features, it is desirable that the number of operations required to produce flame be of minimum number and that the extinguishing operation be prompt and effective to avoid undue consumption of fuel; and that the snuffer employed to extinguish the flame be seated in such manner as to effectively seal the wick and prevent evaporation of fuel and drying of the wick.

It may be stated to be the two-fold purpose of the present invention to provide a lighter improved as to both its structural and its functional characteristics with respect to the features described above.

Turning now to the drawings, in the embodiment of the invention selected for illustration, the lighter is shown as preferably of vertically-elongated, rectangular form, with rounded edge portions. The lighter comprises a casing-structure generally designated by the reference character 10, which includes a body-portion 11, which may be conveniently die-cast, and a hood 12, which may be drawn from sheet-metal. At the junction between the body-portion 11 and its neck 13 there is formed an exterior, upwardly-facing shoulder 14, and the said neck terminates in a head 15. This head 15 is of substantially less cross-sectional area than the cross-sectional area of the body-portion 11, proper. As shown, the head 15 is provided with an interiorly-threaded opening 16 for the reception of a wick-tube, and with an opening 17 arranged to receive a support-tube for a flint-holding sleeve.

The hood 12 of the casing-structure 10 is seated on the said shoulder 14 of the body-portion 11, and the head 15 and the mechanism carried thereon is enclosed and protected by the said hood 12. The top-wall and the upper portion of the front-wall of the hood 12 are formed to

provide a cap-receiving opening 18, having a portion 18*a* in the top-wall and a portion 18*b* in the front wall of the said hood 12 (see Fig. 3).

The portions 18*a* and 18*b* of the said opening 18 are covered and uncovered by a finger-like closure-member 19, and button-operated securing-means are provided which are operable to releasably secure the said closure-member in a position covering the said opening 18 in the hood 12. As shown, there is provided in the lower front-wall of the said hood, below a cross-strip 20, a button-receiving opening 21 in which a push button generally designated by the reference character 22, is movably arranged. As is particularly well shown in Fig. 2, the push button 22 is formed with a base 22*a* having its front surface normally engaging the inner surface of the front-wall of the hood 12 around the button-receiving opening 21 therein. Extending rearwardly from the base 22*a* is a boss 22*b* and an operating button-head 22*c* projects forwardly from the base 22*a* and extends through the said button-receiving opening 21.

A thin U-shaped securing-member, designated as a whole by the reference character 24 and composed of spring material, is arranged in the hood 12 for flexure by the manual operation of the said push button 22. The U-shaped securing-member 24, as shown in Fig. 6, includes opposite arms 24*a* and an intermediate portion 24*b*. The said intermediate portion 24*b* may be of any desired configuration, and, for example, it may be as shown of wave-like form, to insure the desired degree of flexibility. The intermediate portion 24*b* of the securing-member 24 is provided with an opening 24*c* into which the rearwardly-extending boss 22*b* of the push button 22 passes. At its upper edge, the intermediate portion 24*b* is formed with a central, upwardly-extending detent-ear 25 which is provided with an opening 25*a* to releasably receive a detent-tongue formed on the closure-member 19. As shown particularly well in Fig. 5, the securing-member 24 is arranged in the hood 12 with its respective arms 24*a* lying along the opposite side-walls of the said hood and its wave-like intermediate portion 24*b* extending behind the front wall of and across the hood 12 and receiving in its opening 24*c*, the rearwardly-extending boss 22*b* of the push button 22.

In the form of the invention illustrated, a simple and effective attaching arrangement is provided for securing the hood 12 to the casing-structure 10. As is shown in Fig. 7, the means comprise a relatively-rigid U-shaped hood-attaching member 26 having upright arms 26*a*—26*a* and an intermediate portion 26*b*, the latter being provided with a central opening 26*c* through which a support-tube for a flint-holding sleeve about to be described, can pass. The said intermediate portion 26*b* of the hood-attaching member 26 rests on and is cemented or otherwise secured to the top surface of the head 15 of the casing-structure 10. The upright arms 26*a*—26*a* respectively lie against the opposite arms 24*a*—24*a* of the securing-member 24 and fastening-means such as rivets 27—27 pass through the side-walls of the hood 12, through the arms 24*a*—24*a* of the said securing-member 24 and through the said upright arms 26*a*—26*a* of the hood-attaching member 26, to thereby hold the securing-member 24 in place in the hood 12 and to secure the said hood to the head 15 of the casing-structure 10.

Coming now to the flame-producing mechanism, the interior of the body-portion 11 of the said casing-structure provides a fuel-compartment 28 into which fuel of any suitable nature may be introduced, and the fuel-compartment can contain a quantity of absorbent material. Arranged in the fuel-compartment 28 is a wick 29 and for receiving the upper end of the said wick there is provided a wick-tube 30 which is beveled at its upper surface 30*a* to provide a seat for a wick-cap. At its inner end the wick-tube 30 terminates in a tubular, exteriorly-threaded shank 31, threaded into the threaded opening 16 in the head 15. The upper end of the wick 29 passes from the fuel-compartment 28 through the tubular shank 31, through the wick-tube 30 proper and projects above the latter into the shielding-chamber provided by the hood 12.

Extending throughout the length of the body-portion 11 and projecting through the opening 17 in the head 15 is a support-tube 32 which carries a flint-holding sleeve 33. The upper portion of the support-tube 32 is interiorly-threaded and the said flint-holding sleeve 33, exteriorly-threaded along the major portion of its length, is threaded into the said support-tube and is supported thereby. The flint-holding sleeve 33 carries a flint-rod 34, formed of pyrophoric material and the upper coils of a feed-spring 35, which is arranged in the said support-tube 32 enters the said flint-holding sleeve, engages with the flint-rod 34 and urges the said flint-rod upwardly.

Above the support-tube 32 the flint-holding sleeve 33 is formed to provide a shouldered and bifurcated portion 33*a* and in a recess 36 formed in the head 15 around the upper end of the opening 17, a gasket 37 and a washer 38 are fitted. The gasket 37 is suitably secured, as by cementing, to the intermediate portion 26*b* of the hood-attaching member 26 and the washer 38 is arranged, as shown in Fig. 4, with its upper surface engaged by the downwardly-facing shouldered portion of the flint-holding sleeve 33, and its lower surface resting on the gasket 37.

The bifurcated or forked upper portion 33*a* of the said flint-holding sleeve 33 provides arms 39—39, each of which is formed with an opening 39*a*. A pin 40, headed at one end and flattened at its opposite end, passes through the openings 39*a* and projects beyond the outer faces of the said arms 39—39. Rotatably mounted on the pin 40 and confined between the arms 39—39 is a sparking-wheel 41. The wheel 41 has teeth formed in the major portion of its peripheral surface and is provided with a flat face portion 41*a*, and the wheel is so arranged that its teeth scrape the flint-rod 34 to cause sparks to be produced for igniting fuel in the wick 29.

A feature distinguishing the invention and one which enables a number of the advantages of the present disclosure to be secured, is the provision of a separate snuffer-unit for the lighter.

By reference to Fig. 8 in particular, it will be seen, that the separate snuffer-unit, designated as a whole by the reference character 42, includes a cup-shaped wick-cap 43 and a flexible cap-supporting arm 44. At its lower open end, the said wick-cap 43 is formed with an annular lip 43*a*, which has its inner face beveled to provide a complementary seating face for the seat 30*a* of the wick-tube 30. At its opposite end the wick-cap or snuffer 43 is formed with an integral rivet 43*b* which passes through the forward free end 44*a* of the cap-supporting arm 44 and is headed down thereon to securely fasten

the wick-cap **43** to the said cap-supporting arm. The forward portion **44***a* is curved with respect to the rear portion of the cap-supporting arm, and the latter is formed to provide mounting-ears or projections **45—45**. The mounting-ears **45** extend at opposite sides of and at a right-angle to the body-portion of the said cap-supporting arm **44**, and each of the said mounting-ears is perforated at **46** to receive the pin **40**. As illustrated, the rear portion of the cap-supporting arm **44** is arranged to bridge the arms **39—39** of the flint-holding sleeve **33** and the mounting-ears **45—45** are arranged on the pin **40**, one at the outside of and adjacent each of the said arms **39—39**. The rear portion of the cap-supporting arm **44** fits between the flat face portion **41***a* of the wheel **41**, and the inner surface of the top wall of the closure-member **19** and by reason of this arrangement the said closure-member **19**, the snuffer-unit **42** and the wheel **41** are securely coupled for oscillating movement together. The curved forward portion **44***a* carrying the wick-cap **43** extends at an angular direction away from the said closure-member **19**, and flexing or bending of the said forward portion of the cap-supporting arm during movements of the closure-member now to be described, causes relative movement between the closure-member **19** and the wick-cap **43** of the snuffer-unit **42**.

The closure-member **19** includes a relatively-long top wall **48** for closing the top portion **18***a* of the opening **18** in the hood **12**, and a relatively-short front wall **49** extending at a right angle to the said top wall **48** and serving to close the front portion **18***b* of the opening **18** in the said hood. At the rear end of the top wall **48** of the said closure-member, mounting-arms **50—50** are provided, each of which is perforated at **51**. The pin **40** passes through the openings in the mounting-arms **50—50**, which are arranged on the said pin at the outside of the arms **39—39** and are spaced laterally outwardly with respect to the said arms **39**. The lower edge of the front wall **49** is provided with a detent-tongue **52** for entering the opening **25***a* in the detent-ear **25** of the securing-member **24** to releasably secure the said closure-member **19** to the hood in a position closing the opening **18** therein.

Cooperating with the closure-member **19** is a tension-element, which in the arrangement shown is a substantially U-shaped torsion-spring **53**. The central portion **54** of the spring **53** is arranged about the flint-holding sleeve **33** and rests against the washer **38**. The branches **55—55** of the spring **53** pass at opposite sides of the said flint-holding sleeve and intermediate its length, each of the branches **55** is coiled at **56** about the pin **40** between one of the mounting-arms **50** of the closure-member **19** and one of the mounting-ears **45** of the snuffer-unit **42**. The free ends **56—56** of the spring **53** rest against the under surface of the top wall **48** of the closure-member **19**. As will be understood, when the detent-ear **25** of securing-member **24** is moved by the push button **22** to release the detent-tongue **52** of the closure-member **19**, the tensioned spring **53** will act to move the closure-member **19** and cause the said closure-member to be rotated about the pin **40**.

Normaly, the lighter is closed as shown in Fig. 1, and the parts are positioned as shown in Figs. 2 and 4. At such time, the detent-tongue **52** of the closure-member **19** is engaged in the opening **25***a* in the detent-ear **25** of the securing-member **24**. The opening **18** in the hood **12** is closed, and the spring **53** is under tension. The wick-cap **43** of the snuffer-unit **42** covers the projecting upper end of the wick **29** and the beveled lip **43***a* of the said wick-cap is resiliently seated on the beveled seat **30***a* of the wick-tube **30**, to effectively seal the said wick-tube. In the closed position, as shown, the top of the wick-cap or snuffer **43** lies closely adjacent to the under surface of the long top wall **48** of the closure-member **19**.

Upon pressing the push button **22**, the yielding intermediate portion **24***b* of the securing-member **24** will release the detent-tongue **52** of the closure-member **19** and the tensioned spring **53** will act on the said closure-member to cause it to swing to uncover the opening **18** in the hood **12**. By reason of the couple provided between the top wall **48** of the said closure-member **19**, the rear end portion of the wick-cap supporting-arm **44**, and the flat portion **41***a* of the wheel **41**, the closure-member **19** in its swinging movement, wi'l cause the snuffer-unit **42**, which, in turn, will cause the sparking-wheel **41** to be revolved to scrape the flint-rod **34** and produce sparks for igniting fuel in the wick **29**.

As the opening movement is taking place, the free end portion **44***a* of the cap-supporting arm **44** resumes a more curved form. In this manner some relative movement occurs between the wick-cap **43** of snuffer-unit **42** and the top wall **48** of the closure-member **19**. The wick-cap **43** moves to the position indicated in Fig. 3 in which it is so located at a distance sufficiently removed from the wick **29** to provide ample flame space, but is relatively-widely spaced from the top wall **48** of the closure-member **19**, in the direction of the said wick **29**. In this position the wick-cap **43** is arranged to quickly initiate the snuffing operation and avoid unnecessary consumption of fuel.

To close the device, the closure-member **19**, which is especially adapted to one-finger manipulation, may be snapped forwardly and downwardly. The snuffer-unit **42**, which, as has been described, has its cap-supporting arm **44** coupled between the top wall **48** of the closure-member **19** and the flat portion **41***a* of the wheel **41** is likewise caused to turn to bring its wick-cap **43** into position over the wick **29**.

Near the completion of the closing movement of the closure-member, as above described, the wick-cap **43** of the snuffer-unit **42** engages the seat **30***a* of the wick-tube **30** and is yieldingly held in sealing engagement therewith by the flexible arm **44**, despite slight variations or inequalities in the structure. As the detent-tongue **52** of the closure-member **19** is brought into registration with the opening **25***a* of the detent-ear **25** to enter the said opening, the curved forward portion **44***a* of the cap-supporting arm **44** is caused to undergo some straightening and the top wall of the closure-member **19** is moved into a position closely adjacent the top of the wick-cap **43** of the snuffer-unit. By this arrangement the flexible cap-supporting arm **44** enables the wick-cap to accommodate itself to slight assembly variations, and the wick-cap is caused to be resiliently seated with its lip **43***a* in gas-tight relation to the seat **30***a* of the wick-tube **30**, thus effectively sealing the said wick-tube and minimizing the evaporation of fuel and drying of the said wick. As will be understood, the closure-member **19** in its closing movement also acted to cause the torsion-spring **53** to be placed under tension, and when the detent-tongue **52** of the closure-member **19** enters the opening **25***a* in the detent-ear **25** of

the securing-member 24, the closure-member will be releasably held in place, against the tension of the said spring 53, and closing the opening 18 in the hood 12.

It will be observed that the flame-producing mechanism and the snuffer-unit are mounted on the relatively-small head 15 within the area defined by the opening 18 in the hood 12. This provides a desirable close grouped relationship of the parts. It is also clear that the parts comprising the lighter make for easy and economical manufacture and assembly. This is particularly so with respect to the simple and effective mounting and coupling arrangement in which the rear end of the flexible cap-supporting arm 44 is confined between the top wall 48 of the closure-member 19 and the flat surface 41*a* on the sparking-wheel 41.

The invention may be carried out in other specific ways than those herein set forth without departing from the spirit and essential characteristics of the invention, and the present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive, and all changes coming within the meaning and equivalency range of the appended claims are intended to be embraced therein.

I claim:

1. A lighter including in combination: a lighter-body carrying a projecting wick, a pyrophoric-member, and a sparking-wheel; a snuffer-cap for the wick; a closure-member for the lighter-body; and separate spring-means substantially-individual to and exerting tension respectively on the closure-member and snuffer-cap, and comprising a spring engaging and urging the closure-member to open, and a flexible-arm having a free forward supporting-portion carrying said snuffer-cap and bent and spaced from said closure-member, and also having a rear coupling-portion engaging with said closure-member and said sparking-wheel and providing a coupling-connection therewith; the latter acting in opening of the closure-member to cause said arm and sparking-wheel to move therewith to expose said wick for ignition of fuel therein, and also acting in closing of the closure-member to cause the return of said arm and tensioning of its free supporting-portion, the said supporting-portion exerting its tension on the snuffer-cap carried thereby to urge the same downwardly and provide a vapor-seal about the said wick.

2. A lighter including in combination: a lighter-body carrying a projecting wick, a pyrophoric-member, and a sparking-wheel having a toothed-portion and a flat connecting-portion; a snuffer-cap for the wick; a closure-member normally urged to open and having a connecting-portion spaced from the connecting-portion of said sparking-wheel; and a flexible-arm having a free forward supporting-portion carrying said snuffer-cap and bent and spaced from said closure-member, and also having a rear coupling-portion fitted between and engaging the respective connecting-portions of the closure-member and sparking-wheel and providing a coupling-connection therewith; the latter acting in opening of the closure-member to cause said arm and sparking-wheel to move therewith to expose said wick for ignition of fuel therein, and also acting in closing of the closure-member to cause the return of said arm and tensioning of its free supporting-portion, the said supporting-portion exerting its tension on the snuffer-cap carried thereby to urge the same downwardly and provide a vapor-seal about the said wick.

3. A lighter including in combination: a lighter-body carrying a projecting wick, a pyrophoric-member, and a sparking-wheel having a toothed-portion and a flat connecting-portion; a snuffer-cap for the wick; a closure-member normally urged to open and having a connecting-portion spaced from the connecting-portion of said sparking-wheel; and separate spring-means substantially-individual to and exerting tension respectively on the closure-member and snuffer-cap and comprising a spring engaging and urging said closure-member to open, and a flexible-arm having a free forward supporting-portion carrying said snuffer-cap and bent and spaced from said closure-member, and also having a rear coupling-portion fitted between and engaging the respective connecting-portions of the closure-member and sparking-wheel and providing a coupling-connection therewith; the latter acting in opening of the closure-member to cause said arm and sparking-wheel to move therewith to expose said wick for ignition of fuel therein, and also acting in closing of the closure-member to cause the return of said arm and tensioning of its free supporting-portion, the said supporting-portion exerting its tension on the snuffer-cap carried thereby to urge the same downwardly and provide a vapor-seal about the said wick.

4. A lighter including in combination: a lighter-body; a wick projecting therefrom; a supporting-member having a tubular-portion extending above the lighter-body and carrying a pyrophoric-member therein, and also having an integral bifurcated-portion at the upper end thereof carrying a bearing-pin; a sparking-wheel mounted on said bearing-pin between said bifurcations and above said pyrophoric-member; a snuffer-cap for said wick; a closure-member for the lighter-body having side-portions each provided with an opening for said bearing-pin, the bearing-pin passing therethrough exteriorly of the bifurcations of said supporting-member, and said closure-member being normally urged about said bearing-pin to open the same; and a flexible-arm having a free forward supporting-portion carrying said snuffer-cap and bent and spaced from said closure-member, and also having a rear coupling-portion engaging with said closure-member and said sparking-wheel and providing a coupling-connection therewith; the latter acting in opening of the closure-member to cause said arm and sparking-wheel to move therewith to expose said wick for ignition of fuel therein, and also acting in closing of the closure-member to cause the return of said arm and tensioning of its free supporting-portion, the said supporting-portion exerting its tension on the snuffer-cap carried thereby to urge the same downwardly and provide a vapor-seal about the said wick.

5. A lighter including in combination: a lighter-body; a wick projecting therefrom; a supporting-member having a tubular-portion extending above the lighter-body and carrying a pyrophoric-member therein, and also having an integral bifurcated-portion at the upper end thereof carrying a bearing-pin; a sparking-wheel mounted on said bearing-pin between said bifurcations and above said pyrophoric-member; a snuffer-cap for said wick; a closure-member for the lighter-body having side-portions each provided with an opening for said bearing-pin, the bearing-pin passing therethrough exteriorly of the bifurcations of said supporting-member; and

separate spring-means substantially-individual to and exerting tension respectively on the closure-member and snuffer-cap, and comprising a spring engaging and urging the closure-member to open, and a flexible-arm having a free forward supporting-portion carrying said snuffer-cap and bent and spaced from said closure-member, and also having a rear coupling-portion engaging with said closure-member and said sparking-wheel and providing a coupling-connection therewith; the latter acting in opening of the closure-member to cause said arm and sparking-wheel to move therewith to expose said wick for ignition of fuel therein, and also acting in closing of the closure-member to cause the return of said arm and tensioning of its free supporting-portion, the said supporting-portion exerting its tension on the snuffer-cap carried thereby to urge the same downwardly and provide a vapor-seal about the said wick.

6. A lighter including in combination: a lighter-body; a wick projecting therefrom; a supporting-member having a tubular-portion extending above the lighter-body and carrying a pyrophoric-member therein, and also having an integral bifurcated-portion at the upper end thereof carrying a bearing-pin; a sparking-wheel mounted on said bearing-pin between said bifurcations and above said pyrophoric-member and having a toothed-portion and a flat connecting-portion; a snuffer-cap for said wick; a closure-member for the lighter-body having side-portions each provided with an opening for said bearing-pin, the said bearing-pin passing therethrough exteriorly of the bifurcations of said supporting-member, and the said closure-member also having a connecting-portion spaced from the connecting-portion of said sparking-wheel; and separate spring-means substantially-individual to and exerting tension respectively on the closure-member and snuffer-cap, and comprising a torsion-spring engaging and urging said closure-member about the bearing-pin to open, said spring-means also including a flexible-arm having a free forward supporting-portion carrying said snuffer-cap and bent and spaced from said closure-member, and also having a rear coupling-portion fitted between and engaging the respective connecting-portions of said closure-member and said sparking-wheel and providing a coupling-connection therewith; the latter acting in opening of the closure-member to cause said arm and sparking-wheel to move therewith to expose said wick for ignition of fuel therein, and also acting in closing of the closure-member to cause the return of said arm and tensioning of its free supporting-portion, the said supporting-portion exerting its tension on the snuffer-cap carried thereby to urge the same downwardly and provide a vapor-seal about the said wick.

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