March 6, 1951 J. R. BAYSTON 2,544,249

PYROPHORIC CIGAR AND CIGARETTE LIGHTER

Filed Feb. 25, 1948 2 Sheets-Sheet 1

Fig. 1.

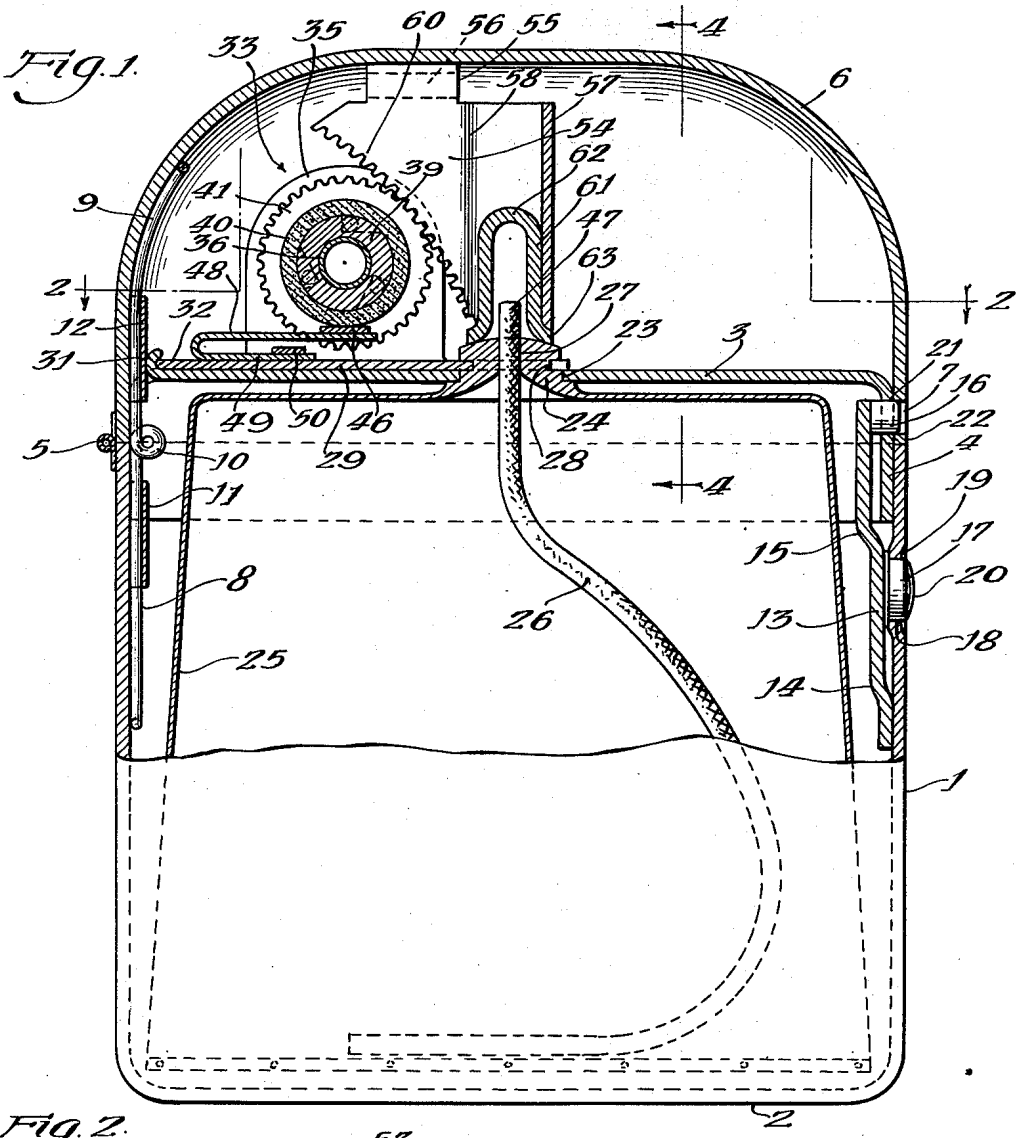


Fig. 2.

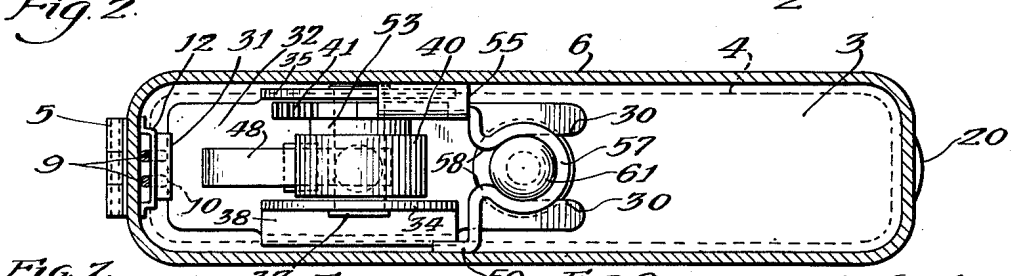


Fig. 7.

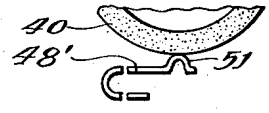


Fig. 8.

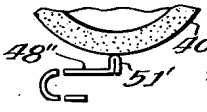
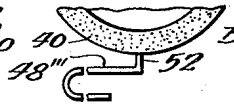


Fig. 9.



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PYROPHORIC CIGAR AND CIGARETTE LIGHTER

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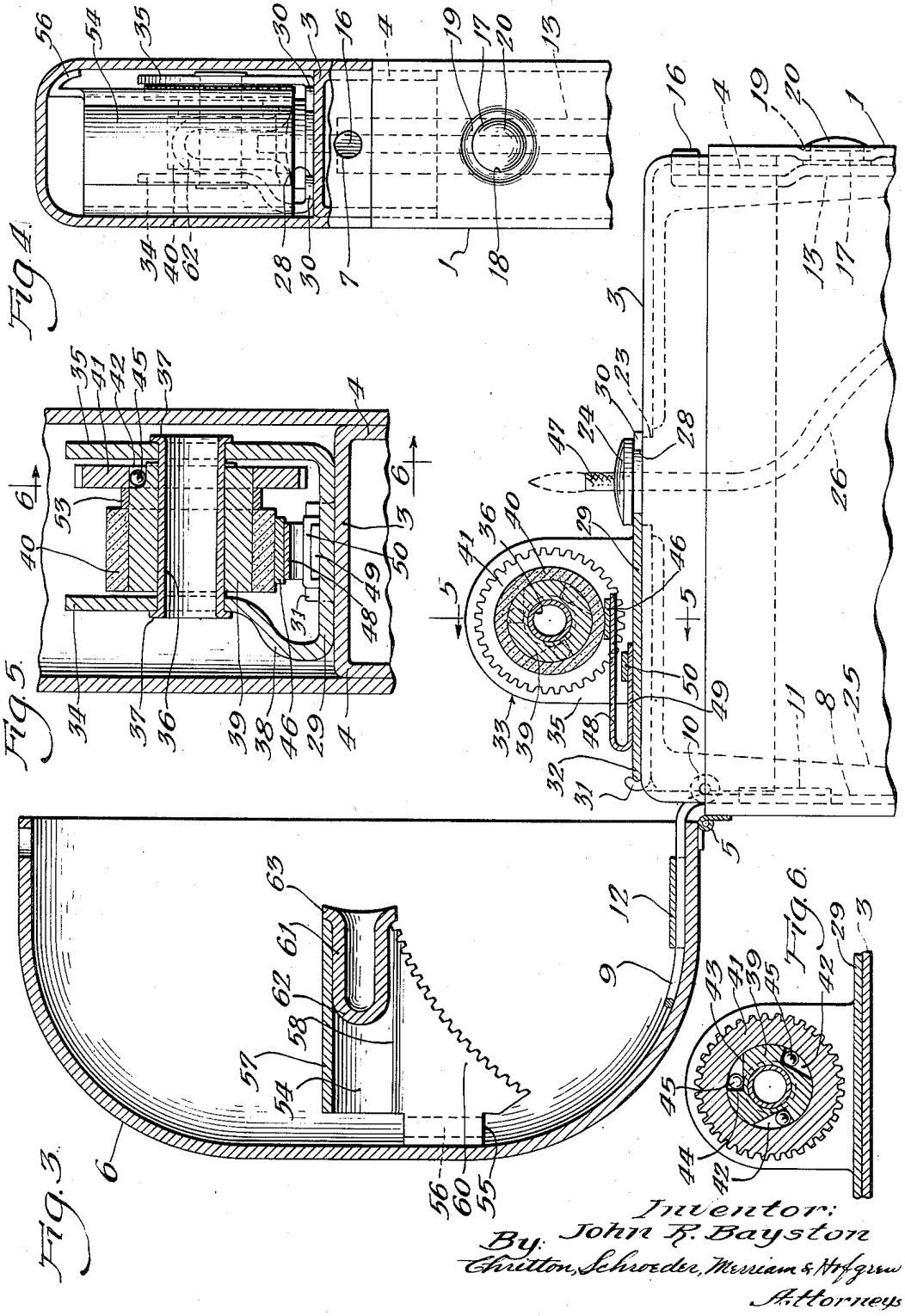

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 3.

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2,544,249

PYROPHORIC CIGAR AND CIGARETTE LIGHTER

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6 Claims. (Cl. 67—7.1)

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This invention relates to a lighter of the type used for lighting cigarettes, cigars and for other similar purposes, and more particularly to a lighter of improved construction including a sparking mechanism that may be removed as a unit and for which a new sparking mechanism can easily and quickly be substituted for the one removed. The lighter of the present invention also embodies a novel arrangement of bridge construction for closing one end of a casing, and to which bridge a fuel container, cartridge or tube may be detachably mounted, and removably held in place by the detachable sparking mechanism.

In lighters prior to the present invention, the sparking mechanism and abrasive elements have been so mounted upon the casing that when one of these parts becomes defective it has entailed considerable trouble to secure repairs for the same. This has caused many lighters to be discarded when, if they could have been readily and quickly repaired their use would have been satisfactorily continued. In the present invention the sparking mechanism is so mounted upon a closure for the casing that when desired the sparking mechanism may be removed as a unit and when desired a new one, obtainable from a supply store or duplicates on hand, may be quickly and easily applied in operative position. Also in the present construction a fuel tube, cartridge or container, obtainable at drug stores or the like, may be easily attached within the casing and when exhausted have a new one substituted therefor.

Among the objects of my invention are: to provide a novel and improved lighter of the type referred to; to provide a lighter having a sparking mechanism removable as a unit; to provide novel means for detachably mounting a fuel container, tube or cartridge within the casing and easily removable when exhausted; to provide novel means for mounting and holding the cover hood in position on the casing; to provide novel means in the cover hood for automatically operating the sparking mechanism when the cover is being moved to open position; to provide a snuffing cap in the means for operating the sparking mechanism; to provide a sparking mechanism having a rotatable cylindrical flint, and a resiliently mounted abrasive element yieldably urged into scraping contact with the rotatable flint; to provide a novel over-running clutch for positively rotating the flint member in one direction of cover opening and leave the flint member stationary when the cover is being closed; to provide a generally improved lighter construction; and such further

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objects, advantages and capabilities, inherently possessed by my invention, as will later more fully appear.

My invention further resides in the combination, construction and arrangement of parts illustrated in the accompanying drawings, and while I have shown therein a preferred embodiment, I wish it understood that the same is susceptible of modification and change without departing from the spirit of my invention.

In the drawings:

Fig. 1 is a vertical longitudinal section on a median plane of a lighter embodying the present invention, the lower part being shown in elevation.

Fig. 2 is a transverse section on line 2—2 of Fig. 1.

Fig. 3 is a fragmentary section similar to Fig. 1, but showing the upper portion of the casing in elevation and the cover in open position.

Fig. 4 is a vertical section on the line 4—4 of Fig. 1, but showing the lower edge of the cover and the upper portion of the casing in edge elevation.

Fig. 5 is an enlarged fragmentary section on the line 5—5 of Fig. 3.

Fig. 6 is a section, of a reduced size, on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary edge view, partly broken away, of a cylindrical flint member, with a modified form of means for resiliently urging the abrasive member against the flint wheel.

Fig. 8 is a view similar to Fig. 7 but showing a further modification of the arm for urging the abrasive member against the flint wheel.

Fig. 9 is a view similar to Fig. 7 but showing a still further modified form of resilient arm for urging the abrasive member against the flint wheel.

In the form of my invention, shown for illustrative purposes in the drawings, my improved lighter comprises a main casing 1 closed at the bottom 2 and having its normally open upper end closed by a bridge member 3 the marginal flanges 4 of which are slidably inserted into the inside of the upper edges of the casing to be frictionally but removably held in position therein. Swingably mounted upon the case 1 by a hinge member 5 is a cover hood 6 of hollow construction and having its front edge, adjacent the lower edge of the front lip formed with an opening 7. The cover hood 6 is normally urged to move into open position by means of a spring having a lower portion 8 and an upper portion 9 integrally connected together by any suitable number of loops 10. This spring member 8—10

is so formed that when it has moved to unrestrained position, or substantially thereto, it will occupy the position shown in Fig. 3. When the cover is closed this spring will occupy the position shown in Fig. 1, at this time being under tension because of the straining movements of loops 10 during the closing of the cover. Bottom portion 8 of the spring may be inserted downwardly into the casing behind the keeper 11, and the upper portion 9 of the spring may be positioned upwardly within the cover and held in place behind the keeper 12. This spring may be of any detailed construction desired such as spring wire, a flat spring, or the like.

Fixed at its lower end to the inside surface of the casing 1 is a resilient arm 13 slightly bent inwardly at 14 and 15, and having fixed at its upper end an outwardly extending projection or detent 16. Fixed intermediate of the length of arm 15 is a push button 17 slidable in a hole 18 formed in an adjacent portion of the casing 1. The material of the casing around the opening 18 is formed with a depression 19, and the outer end of the button 17 is curved at 20 so that the button will not extend any great distance outwardly, and will thus prevent accidental opening of the cover. Also formed in the flange 4 of the bridge member 3 is an opening 21 through which the projection or detent 16 also slidably extends. Hole 7 of the cover and hole 21 of the bridge flange are is registry when the cover is closed, and at this time the detent or projection 18 extends through hole 21 and a slight distance into opening 7 under urge of the resilient arm 13. When it is desired to open the cover all that is necessary is to push a slight distance inwardly on button 20 and the cover will, under the action of spring 8—10 immediately spring into open position. When it is desired to remove the bridge member 3 from the upper end of the casing the button 20 may be pushed a farther extent inwardly to free the projection 16 from hole 21 in the bridge flange after which the bridge 3 may be pulled upwardly out of the upper end of the casing. When the cover is closed the integral strip of metal 22 below opening 7 will form a stop for the outer edge of projection 16.

Bridge member 3 in its central portion is formed with an opening 23 within which is removably positioned the neck 24 of a fuel container, tube, or cartridge 25 adapted to contain any desired kind of fuel, liquid or paste, and within which tube or container is positioned a wick 26 extending from the bottom of the tube or container upwardly and a short distance outwardly through the central hole 27 formed in neck 24. Neck 24 is formed around its outside with a circumferential groove 28, the lower horizontal edge of which groove is in substantial alignment with the upper surface of bridge member 3.

An exhausted fuel tube or container may be easily removed from the casing by removing the bridge 3 from the casing in the manner described above, and then removing the sparking mechanism base plate 29 from engagement with neck 24. As seen in Fig. 2 the right hand end of base plate 29 is formed with a slot 30 of a depth to enable this slotted end to be pushed to the right over the neck 24 so that the edges of said slot are seated in the circumferential groove 28 of the neck. Bridge 3 at the left hand end as viewed in Fig. 1 is formed with an upturned cut-out portion 31 slightly curved inwardly a sufficient distance to receive the rear end 32 of plate 29 after the edges of slot 30 have been pushed into position over the neck and the rear end of this plate pushed downwardly to be seated within the slightly re-entrant surface of projection 31. This securely locks the neck of the tube or container, and the tube or container, in position within the casing until exhausted after which it may be removed and a new one substituted in the manner described above.

Plate 29 forms the bottom or base of a sparking mechanism unit designated generally at 33 and comprising a pair of laterally spaced apart upstanding side walls 34 and 35 integrally connected at their lower ends to the base plate 29. This forms a supporting bracket between and through which extends a hollow rivet or other suitable supporting member 36 which is riveted over at its ends as shown at 37 so as to be fixed in position between the bracket walls 34 and 35. The lower edge portion of side wall 34 of the supporting bracket is outwardly bulged at 38 to afford a wider base for stability. Rotatably mounted upon the outside surface of the cylindrical hollow rivet 36 is a sleeve member 39 having fixedly mounted upon the exterior of one of its ends the cylindrical sleeve 40 formed of any suitable flint material well known in the lighter industry. As is well known this flint material when vigorously rubbed with an abrasive material will create a shower of sparks. Also mounted on sleeve member 39 in slightly longitudinally spaced relation to flint member 40 is a toothed gear wheel 41 which is mounted upon sleeve member 39 with an over-running clutch connection which in one direction of rotation clutches the sleeve member 39 to rotate the same and the flint sleeve 40, and in the other direction of rotation runs free of said sleeve member 39.

This over-running clutch construction will be understood in Figs. 1, 5, and 6, in which the sleeve member 39 is formed at its right hand end as viewed in Fig. 5 with circumferentially spaced apart notches or cut away portions 42 which as seen in Fig. 6 are triangular in cross section so as to provide a long side 43 and a short side 44. Mounted in each of these cut away portions is a ball 45 of a size such that when the gear 41 rotates in a counterclockwise direction as viewed in Figs. 1 and 6 each of the balls 45 will be forced to roll along the side 43 of the cut-away portion which side together with the inner circumference of the central opening in the gear forms a space decreasing in height. This causes the balls 45 to grip the gear 41 to the sleeve member 39 to carry these parts together when the gear rotates during opening of the cover 6. This rotation of sleeve member 39 carries with it the flint sleeve 40 and causes the latter to rub against the abrasive member 46 and creates a shower of sparks directed toward the upper end 47 of the wick 26. This wick being saturated with fuel will immediately ignite for lighting purposes.

The abrasive member 46 is fixed in any desired manner adjacent the free end of the resilient U-shaped arm 48, the lower portion 49 of which is bent under the upper portion and at its end is frictionally forced into the pocket underneath the upstanding strap 50, which strap may be U-shaped and welded or otherwise fixed at the bottom of its side legs to the upper surface of the base plate 29, or may be stamped out from said base plate, or otherwise formed as desired. From this it is seen that the U-shaped resilient arm 48 may be removed from the base plate by pulling the lower portion 49

out of the pocket under strap 50 for repairs, or a new one inserted if desired. In Fig. 7 this U-shaped arm is shown at 48' as being formed at its free end with an upwardly bent portion 51 to scrape against the circumference of the flint sleeve for sparking purposes. In Fig. 8 this U-shaped resilient arm is shown at 48'' as having a similar projection 51' except that instead of this projection being open, the two sides thereof are forced together so that its upper edge will scrape against the flint sleeve. In Fig. 9 this U-shaped member is shown at 48''' as formed at its free end with an upstanding flange 52 to scrape against the flint sleeve. As seen in Fig. 5 a spacing collar 53 is positioned between the flint sleeve 40 and the gear 41 to properly space these elements a desired distance apart. Also in Fig. 5 it will be seen that the open end of the slots or openings 42 are closely adjacent the inner surface of the bracket side wall 35 so as to prevent these balls from falling out of these slots or openings, and confine them in operative position.

As seen in Figs. 1, 3 and 4 there is rigidly fixed in the cover or hood 6 a driving element 54 having an upstanding portion 55 curved laterally and downwardly at 56 and welded or otherwise fixedly secured to the upper inner surface of the cover 6. This driving element 54 is formed at its front portion with a circumferentially curved portion 57 to form an upstanding tubular portion spaced apart at the rear edges 58. One of these spaced apart portions 58 as viewed in Fig. 2 extends laterally and at its end is bent into a flange 59 which is welded or otherwise secured to the inner side surface of the cover 6. The opposite edge portion 58 is extended laterally in the opposite direction and then rearwardly to form the toothed sector or quadrant 60, the teeth of which, when the cover is closed, engage with the teeth of the gear 41. The toothed portion of the quadrant 60 is formed on the arc of a circle about the axis of the hinge 5 as a center so that when the cover 6 is swung to open position the teeth of quadrant 60 will, through engagement with the teeth of gear 41 cause rotation of the flint sleeve to produce sparks for lighting the wick when the cover is being swung to open position. As seen in Fig. 3, the toothed quadrant 60 has moved a substantial distance away from the gear 41 when the cover is completely open. When however the cover is again swung to closed position the teeth of quadrant 60 will again engage the gear 41 but due to the overrunning clutch, described above, there will be no rotation of the flint sleeve, and no sparks produced during the closing of the cover.

Fixed within the tubular portion 57 of the driving member 54 is a snuffing tube 61 the upper portion of which is closed at 62 and the lower portion of which is formed with an outwardly flared skirt 63 which when the cover is closed snugly fits over the curved upper surface of the neck 24 to snuff out the flame of the wick. As seen in Fig. 3 this snuffing cap 61 is moved away from the wick at the start of the opening movement of the cover so as to leave the wick exposed for ignition by the sparks.

The fuel tube or cartridge 25, as well as the sparking mechanism 33 as a unit, may each or both be obtainable at drug stores or other places of sale, and may be quickly and easily applied to the lighter of the present invention when such renewals are required.

Having described my invention, I claim:

1. A lighter, comprising, a main casing, a cover hood swingably mounted on said casing, a bridge in one end of said casing, said bridge having a flat top and a central opening adapted to removably receive the neck of a fuel tube, a flat base plate longitudinally slidable in face to face contact with said bridge and having in its forward end a slot adapted to slide forwardly over said tube neck when the latter is in said opening, said bridge having a projection to prevent rearward movement of the base plate when the slot is over the neck, sparking mechanism on said base plate including a rotary flint member and an abrasive element resiliently urged against the flint member, and means in said hood to rotate the flint member when the hood is swung open, said fuel tube neck having a circumferential groove to receive the edge walls of said slot.

2. A lighter as claimed in claim 1, in which said means includes a toothed quadrant member fixed in said hood, and a snuffing cap fixedly mounted in said quadrant member, the teeth of said quadrant engaging complemental teeth on the rotary flint member as the hood approaches closed position and being removed a substantial distance away from said complemental teeth when said hood is fully open.

3. In a lighter, a casing, a bridge, a base plate removably mounted on the bridge, sparking mechanism carried by the base plate and including a rotatable flint member and a resilient arm removably attached at one end to the base plate and adjacent its free end having means to frictionally engage the rotatable flint member, said bridge having an intermediate opening, a fuel tube neck protruding through said opening, means at one end of the plate for connecting it to said neck, a detent projection on the bridge at the other end of the plate, whereby said other end may be raised above said projection and the plate moved longitudinally on the bridge to free said connection with the neck and remove the sparking mechanism and plate as a unit from the bridge.

4. In combination in a lighter, a casing, a bridge detachably secured in one end of the casing and having a central opening, a fuel tube in said casing and having a grooved neck removably positioned in said opening, a plate slidably mounted on said bridge and having a slotted end straddling the tube neck with an edge of the slot seated in the groove of the neck whereby the tube may be removed by sliding the plate to release the neck, and sparking mechanism mounted on said plate to be removed from the bridge with the plate as a unit when the plate is removed from said neck by a sliding movement of the plate.

5. In combination in a lighter, a casing, a bridge having a marginal flange removably seated in one end of the casing, a cover swingably mounted on said casing, said cover and bridge flange having apertures that register when the cover is closed, a resilient arm secured at one end to the inside of the casing and having on its free end a projection adapted to snap into said registering apertures, a button fixed to an intermediate portion of the length of said arm and being slidable in an opening in the casing, the outer face of the casing around said last mentioned opening being depressed to enable the use of a short button to prevent accidental releasing of the cover and to enable said pro-

jection to be moved inwardly clear of the aperture in the flange for removal of the bridge from the casing, and sparking means on said bridge.

6. In a lighter, a casing having an open end, a bridge having a flat top formed with an intermediate opening and a marginal flange removably inserted in the open end of the casing, a fuel tank having a neck adapted to extend through said opening, said flat top having an upstanding projection adjacent one end, a base plate having at one end an edge portion adapted to seat under a shoulder formed in said neck, sparking mechanism mounted on said base plate and including a rotatable cylindrical flint member and a resilient arm having an abrasive element, said base plate being longitudinally slidable on the top of the bridge, whereby the base plate may be slid longitudinally of the bridge to bring one end portion of the base plate under the shoulder of said neck and its opposite end pushed downwardly behind said projection to firmly hold the sparking mechanism and plate in position, and when desired the end of the

base plate behind the projection can be lifted thereabove and the base plate slid rearwardly from the neck to remove the base plate and sparking mechanism from the bridge as a unit.

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