Jan. 11, 1938. L. V. ARONSON 2,104,965

FLAME PRODUCING MECHANISM

Filed May 23, 1934

Fig. 1.

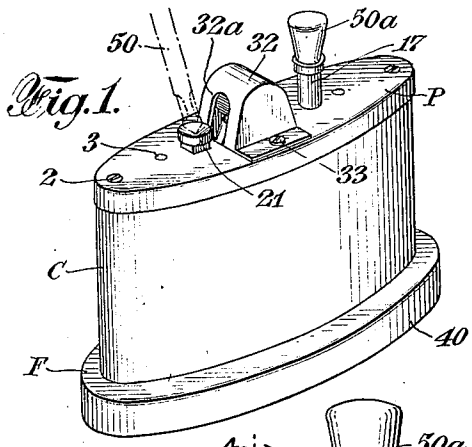


Fig. 7.

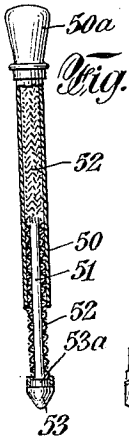


Fig. 2.

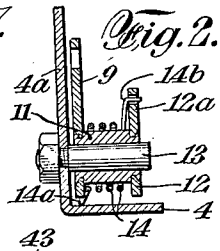




Fig. 8.

Fig. 3.

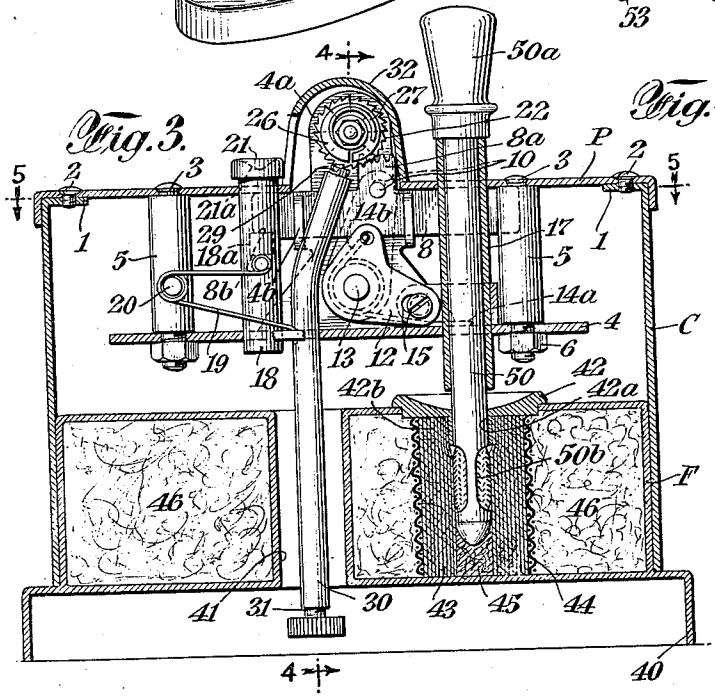


Fig. 4.

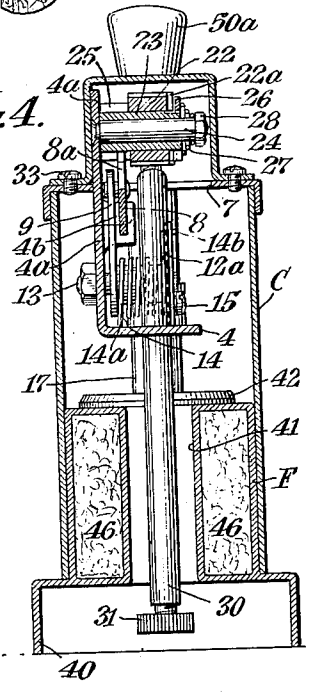


Fig. 5.

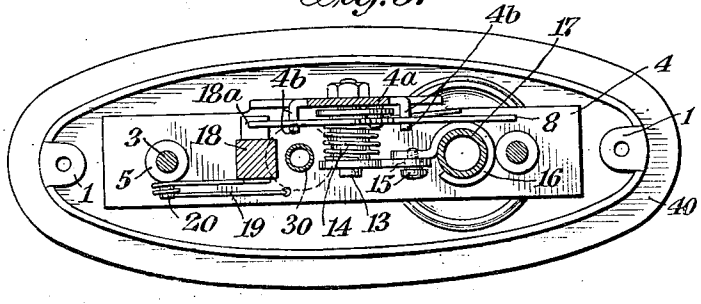
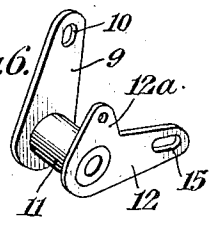


Fig. 6.



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FLAME PRODUCING MECHANISM

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Application May 23, 1934, Serial No. 727,060

4 Claims. (Cl. 67—4.1)

My invention relates to flame-producing mechanism utilizable for any desired purpose such, for example, as for the ignition of cigarettes, cigars, pipes or the like.

My invention, in an important phase thereof, involves the use of a fuel-carrying member for actuating mechanism by which sparks are produced for the ignition of such fuel, said fuel-carrying member being normally associated with the housing for such mechanism.

Various other objects, advantages and characteristics of my invention will become apparent from the following detailed description.

My invention resides in the flame-producing mechanism, combinations and features of the character hereinafter described and claimed.

For an understanding of my invention and for an illustration of one of the many forms thereof, reference is to be had to the accompanying drawing, in which:

Figure 1 is a perspective view of flame-producing mechanism as constructed in accordance with my invention;

Fig. 2 is a vertical sectional view, partly in elevation, of a part of my novel mechanism;

Fig. 3 is a vertical sectional view, partly in elevation, of the mechanism shown in Fig. 1;

Fig. 4 is a transverse, vertical sectional view, partly in elevation, and is taken on the line 4—4 of Fig. 3;

Fig. 5 is a horizontal sectional view, partly in plan, and is taken on the line 5—5 of Fig. 3 looking in the direction of the arrows;

Fig. 6 is a perspective view of a part of my novel mechanism;

Fig. 7 is a vertical sectional view of one form of my novel torch-forming member; and

Fig. 8 is a perspective view of a structure adapted to be disposed interiorly of the fuel casing.

Referring to the drawing, C represents a main casing which may be of oval or other suitable configuration, such casing being formed from sheet metal or other suitable material. In accordance with a preferred form of the invention, the main casing C is open at the bottom so as to telescopically and detachably receive a fuel casing F. The main casing C is adapted, in suitable manner, as by the lugs 1 and screws 2, to have a cover plate P secured thereto.

In the form of the invention shown herein the cover plate P serves as a support for the various parts of mechanism which enter into and form the complete assembly. To this end, said cover plate P may serve as a support for a plurality of depending bolts 3 which carry a horizontal frame plate 4, the latter being anchored on said bolts 3 by the thereby-carried spacing sleeves 5 and nuts 6. The frame plate 4 comprises a vertical section 4a which extends upwardly through an opening 7 formed in the cover plate P.

The aforesaid vertical section 4a of the frame plate 4 comprises a pair of horizontally alined spaced bracket sections 4b forming alined passages which receive and slidably support a member 8 having a vertical section 8a extending upwardly through the aforesaid opening 7 of the cover plate P, said section 8a, on the upper surface thereof, being provided with rack teeth.

The upper end of a lever 9 is connected by a pin-and-slot connection 10 with the aforesaid member 8. The lower end of lever 9 has one end of a sleeve 11 anchored thereto, the other end of said sleeve 11 being anchored to a second lever 12. As shown on the drawing, the sleeve 11 is rotatably mounted on a fixed pin or axle 13 which is horizontally anchored in the aforesaid vertical section 4a of the frame plate 4. A spring 14 is coiled around the sleeve 11, one end 14a of this spring resting upon the frame plate 4, Fig. 3, and the other end 14b of said spring 14 being secured in an opening formed in a projecting section 12a of the aforesaid lever 12. As shown, said last named lever 12 is connected by a pin and slot connection 15 with the shank of a collar 16 which is soldered or otherwise suitably secured to a sleeve 17 mounted for vertical, reciprocatory movement in alined passages formed, respectively, in the frame plate 4 and the cover plate P.

The frame plate 4 and the cover plate P are provided, respectively with other alined passages which slidably receive a member 18 biased in an upward direction by a suitable spring 19 which may be secured on a pin 20 projecting from the adjacent sleeve 5, the ends of said spring engaging the member 18 and the frame plate 4, respectively. The member 18 is provided with a laterally extending section 18a which is adapted to coact with the notch end 8b of the aforesaid slidable member 8. As shown in Figs. 1 and 3, the upper end of the member 18 terminates above the frame plate P and carries a cap member 21 which may be formed with a suitable recess 21a, said cap member 21 being utilizable as hereinafter described.

The aforesaid member 8 is adapted to be moved from right to left and vice versa, Fig. 3, to thereby actuate suitable spark-producing mechanism. In the form of the invention herein illustrated, although not necessarily, this spark-producing

mechanism is of the pyrophoric type and is disposed above the cover plate P. As herein shown, such pyrophoric spark-producing mechanism comprises a wheel 22 having a serrated or roughened peripheral surface. Extending axially through this wheel 22 is a sleeve 23 rotatably mounted on a pin or axle 24 horizontally anchored on the vertical section 4a of the frame plate 4. A pinion 25 is formed integrally with the sleeve 23 and this pinion is disposed in meshing relation with respect to the rack teeth at the upper surface of the vertical section 8a of the member 8. The side of the serrated wheel 22 removed from the pinion 25 is provided with rack teeth 22a with which coacts a ratchet disk 26 mounted on the adjacent end of the sleeve 23, said ratchet disk 26 being biased from right to left, Fig. 4, by a coiled spring 27 which is disposed between said disk 26 and a nut 28 threaded to the outer end of the pin 24. The ratchet disk 26 is freely slidable axially on the projecting end of the sleeve 23 but is otherwise fixed thereto so as to be rotatable therewith.

Coactable with the serrated peripheral surface of the wheel 22 is a pyrophoric element 29, Fig. 3, which is supported in an elongated tube 30 extending downwardly through and anchored to the frame plate 4. A suitable coil spring, not shown, is disposed in the tube 30, this coil spring seating against the upper end of a headed screw 31. By virtue of this arrangement the pyrophoric element 29 is properly biased into engagement with the peripheral surface of the wheel 22.

As shown on the drawing, the spark-producing mechanism above described is disposed between the upper end of the sleeve 17 and the upper end of the member 18. Such mechanism is so positioned and arranged that the sparks produced by clockwise rotatable movement of the wheel 22, Fig. 3, pass along a diverging path which extends above the cap member 21. Preferably, the spark-producing mechanism is enclosed by a cap structure 32 which is secured to the cover plate P by screws 33. As shown, this cap structure 32 is provided with a passage 32a through which sparks are adapted to pass along the path above noted.

The above noted fuel casing F is of oval configuration, in correspondence with the configuration of the main casing C within the lower end of which it is slidably received. As shown, the fuel casing F comprises a lower flanged section 40 adapted to rest upon a suitable surface and thereby support the entire mechanism. As illustrated on the drawing, the fuel casing F is so formed as to define a sleeve-like passage 41 through which the aforesaid tube 30 extends.

Frictionally secured to the upper surface of the fuel casing F is a cap 42 which is provided with a vertical passage 42a disposed in alinement with the vertical passage defined by the aforesaid sleeve 17. The cap 42 comprises a depending sleeve-like section 42b which enters the upper end of a vertical passage defined by a structure 43 formed from a strip of suitable material, such as felt which is spirally wound in the manner indicated in Fig. 8 and retained in such configuration by adhesive secured to the layers of the felt strip. Preferably, a section 44 of open mesh material such as may be fabricated from copper wire is disposed around the structure 43 to more firmly retain it in the shape indicated. Further, as shown in Fig. 3, the lower end of the passage defined by said structure 43 may be closed by a wad 45 of suitable absorbent material.

As illustrated in Fig. 3, the fuel casing F contains a mass of suitable absorbent material 46 such, for example, as cotton. Assuming that this absorbent material 46 together with the structure 43 are disposed in the casing F as shown, the cap 42 may then be secured to the top wall of said casing F with the sleeve section 42b thereof depending into the upper part of the passage defined by the structure 43. In this manner, said structure 43 is held in the position shown in Fig. 3.

In Fig. 3, I have shown as disposed in the sleeve 17 an elongated member 50 formed with an upper handle section 50a. As illustrated in Fig. 7, the member 50 is of tubular construction and has a stem 51 disposed therein, this stem carrying a detachable fabric sleeve 52 formed, for example, from cotton strands woven or knitted to form the fabric. The lower end of the stem 51 terminates in a head 53 having a reduced section 53a adapted to be inserted into and frictionally engage the lower interior surface of said member 50. As clearly shown on the drawing, the lower end of the tubular member 50 is cut away to form one or more passages 50b whereby the underlying section or sections of the fabric sleeve 52 are exposed.

With the form of the invention herein illustrated, the fuel casing F may be removed from the main casing C when it becomes necessary to refuel said casing F, the fuel which is thus utilized being of any suitable type such, for example, as heretofore utilized for supplying pyrophoric lighters. With the present invention, it is desirable that a high test gasoline be utilized for fueling purposes and, accordingly, with the fuel casing F removed from the main casing as described above, a suitable quantity of such gasoline may be introduced into said fuel casing by passing the same through the opening in the cap 42 thereof. This fuel is taken up by the felt structure 43 and the absorbent material 46.

With the various parts of the mechanism positioned as illustrated in Fig. 3, fuel fumes or liquid fuel as such passes from the absorbent material 46, through the open mesh section 44, and then through the felt structure 43, such fuel being then absorbed by the fabric sleeve 52. Due to the fact that the fabric sleeve 52 extends upwardly within the tubular member 50, it results that said fabric sleeve 52 takes up a quantity of fuel and, therefore, in a sense, acts as a fuel reservoir of restricted capacity.

In a sense, the tubular member 50 serves as a stopper for the fuel casing F since a close fit exists between said tubular member 50 and the sleeve section 42b of the cap 42. This sealing action is enhanced, to some extent, by the felt structure 43 since the inner surface thereof should be somewhat smaller in diameter than that of the tubular member 50 whereby said inner surface resiliently engages and grips the lower end of said tubular member 50.

When the herein described mechanism is to be operated, the handle section 50a is grasped by the fingers of one hand and lifted upwardly whereby the tubular member 50 is entirely removed from the sleeve 17. The head 53 at the lower end of the tubular member 50 is then disposed in the depression 21a of the cap member 21. Downward pressure is then applied to said cap member 21 whereby the member 18 is moved downwardly to disengage the lateral section 18a thereof from the notched end 8b of the member 8. The spring 14 is wound at this time and,

accordingly, in response to such disengagement of the parts noted above, the member 8 moves from right to left, Fig. 3, with a snapping action. As hereinbefore described, the member 8 is geared to the serrated wheel 22 through the member 8a, pinion 25, sleeve 23 and ratchet disk 26. Accordingly, the described snapping movement of the member 8 imparts a step rotation to the ratchet disk 26 in a clockwise direction, Fig. 3. When moving in this direction, the ratchet disk 26 clutches the serrated wheel 22 and it results, therefore, that the described snapping action of the member 8 causes a quick impulse of rotative movement to be applied to the serrated wheel 22 in a clockwise direction, Fig. 3.

In response to such rotative movement of the serrated wheel 22, a shower of sparks are produced at the surface of the pyrophoric element 29 and these sparks are projected into engagement with those exposed parts of the fabric sleeve 52 which are at the lower end of the tubular member 50 as the latter rests upon the cap member 21 in the position shown in Fig. 1. The fuel charge carried by the exposed parts of said fabric sleeve 52 is thereby ignited, the tubular member 50 then becoming a torch, in effect. Said tubular member 50 may now be shifted to such position as may be desired to light a cigarette, pipe, candle or other object and it may be passed from hand to hand in so doing.

When the lighting operation has been completed, the tubular member 50 is reinserted in the sleeve 17 and, when thus reinserted, the flame at the lower end thereof is extinguished. In response to continued downward movement of the tubular member 50, the lower end thereof first enters the cap member 42 and then is seated in the vertical passage defined by the felt structure 43 to thereby seal the fuel casing F. After the lower end of the tubular member 50 has thus been reseated in the fuel casing F, fuel from such casing is absorbed or taken up by the fabric sleeve 52 to thereby replenish the supply of fuel which said fabric sleeve 52 is normally intended to contain.

After the tubular member 50 has been reinserted in the sleeve 17 and before the lower end thereof becomes entirely seated in the fuel casing F as described above, the lower surface of the handle section 50a engages the upper end of the sleeve 17. When engagement between these parts has thus been effected and in response to continued downward application of pressure, it results that the sleeve 17 is moved downwardly and, in so moving, carries the collar 16 therewith. As a result, the levers 12 and 9 are rocked in a clockwise direction, Fig. 3, to wind the spring 14 and shift the member 8 from left to right, Fig. 3, this movement of the member 8 continuing until the notched section 8b thereof clears the lateral section 18a of the member 18. When this happens, the member 18 moves to its upper position under the control of the spring 19 to thereby disengageably latch the member 8 in the position shown in Fig. 3. During such movement of the member 8, the ratchet disk 26 idles with respect to the serrated wheel 22 which, accordingly, remains stationary.

After the operation described above has been completed, all of the parts of the mechanism are positioned as illustrated in Fig. 3 and such mechanism is in condition for subsequent operation in the manner hereinbefore described.

It is to be understood that the mechanism hereinbefore specifically described is merely illustrative of the many embodiments which the invention may take. Thus, for example, in lieu of the described spark-producing mechanism, it shall be understood that other equivalent arrangements for obtaining uni-directional movement of a serrated wheel may be utilized. Furthermore, it is to be understood that fuel may be supplied to the fuel casing F in any convenient manner otherwise than as herein described. It shall also be understood that the sealing arrangement for the lower end of the torch member 50 may assume any one of a variety of forms in accordance with the broad purview of the invention.

While the invention has been described with respect to a certain particular preferred example which gives satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. In combination, a casing, pyrophoric spark-producing means, a horizontal member connected to said spark-producing means, said horizontal member being mounted for reciprocatory movement while remaining in a horizontal position, spring means for operating said reciprocatory member, means for storing energy in said spring means, a vertical member slidably disposed adjacent said reciprocatory member, and means forming a disengageable connection between said vertical and reciprocatory members, said energy-storing means comprising a vertical member slidably disposed within said casing and said energy-storing means further comprising a lever having one arm connected to said reciprocatory member and another arm connected to said second named vertical member.

2. In combination, a casing, pyrophoric spark-producing means, a horizontal member connected to said spark-producing means, said horizontal member being mounted for reciprocatory movement while remaining in a horizontal position, spring means for operating said reciprocatory member, means comprising a vertical slidably disposed member for storing energy in said spring means, a second vertical member slidably disposed adjacent said reciprocatory member, means forming a disengageable connection between said reciprocatory and said second named vertical member, a horizontal frame member disposed interiorly of said casing, said frame member forming bearings for said vertical members, and a fuel casing detachably disposed in said first named casing.

3. In combination, a casing, pyrophoric spark-producing means, a horizontal member connected to said spark-producing means, said horizontal member being mounted for reciprocatory movement while remaining in a horizontal position, spring means for operating said reciprocatory member, means for storing energy in said spring means, a vertical member slidably disposed adjacent said reciprocatory member, and means forming a disengageable connection between said vertical and reciprocatory members, said energy-storing means comprising a vertical member slidably disposed within said casing and said energy-storing means further comprising a lever having one arm connected to said reciprocatory member and another arm connected to said second named vertical member, said reciprocatory

member and said lever being the sole operating means between said vertical members.

4. In combination, a casing, pyrophoric spark-producing means, a horizontal member connected to said spark-producing means, said horizontal member being mounted for reciprocatory movement while remaining in a horizontal position, spring means for operating said reciprocatory member, a vertical sleeve slidable vertically in said casing, means comprising a manually actuatable torch for operating said vertical sleeve to store energy in said spring means, a second vertical member slidably disposed adjacent said reciprocatory member, and means forming a disengageable connection between said second vertical member and said reciprocatory member.

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