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LIGHTER

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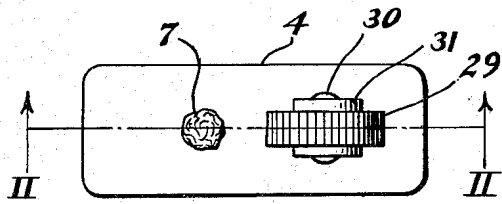


FIG. I

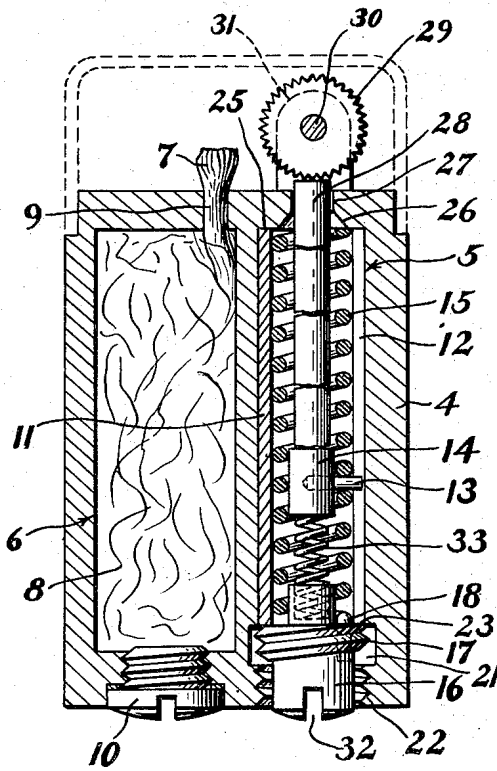


FIG. II

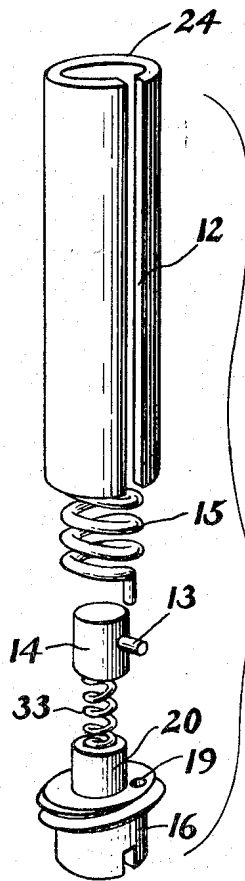


FIG. III

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LIGHTER

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This invention relates to lighters and has particular reference to an improved construction of lighter of the type embodying a sparkwheel and flint arranged to ignite a wick saturated with an inflammable fluid and method of making the same.

Prior art lighters of the above character, as far as is known, only held one flint member in operative position at a time and embodied a relatively long spring for imparting a tension or yielding pressure of said flint member on the sparkwheel. When the full extent of usefulness of the flint member was spent, it immediately necessitated replacement by another flint member, and, in so doing, required the disassembling and reassembling of the flint supporting parts.

Such prior art constructions of lighters required replacement flints to be carried by the user and involved many difficulties such as the loss of such extra flints or the complete failure on the part of the user to carry such flints. Conditions of this nature, in most instances, arose at times when replacement flints were not readily obtainable.

It, therefore, is one of the principal objects of this invention to overcome the above difficulties through the provision of a lighter with a flint supporting feed mechanism whereby a plurality of flints may be placed in said lighter and be successively moved into operative position with respect to the sparkwheel as the previously exposed flint is used up, and method of making the same, whereby the resilient tension on said flints may be regulated to control the yielding pressure engagement of the exposed flint on the sparkwheel.

Another object is to provide an arrangement whereby a plurality of successively usable flints may be guided into operative position with the sparkwheel without requiring the disassembling of the flint supporting mechanism, and with which the spring pressure on the flints successively guided into engagement with the sparkwheel may be regulated in order to insure smooth and efficient function of the sparkwheel and ease of manipulation of the lighter.

Another object is to provide a flint operating mechanism for a lighter of the character described which may be quickly and easily detached for replacement of a plurality or battery of flints.

Another object is to provide resilient means which performs the dual function of moving a plurality of flint members progressively into operative relation with a sparkwheel and of controlling and regulating the pressure of said flint members on said sparkwheel.

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Another object is to provide a construction of the last mentioned nature, having an additional spring member functioning cooperatively with the main feed spring for regulating the yielding pressure of the flint in engagement with the sparkwheel, when a maximum amount of flint members are in the flint chamber.

Other objects and advantages of the invention will become apparent from the following description taken in connection with the accompanying drawings, and it will be apparent that many changes may be made in the details of construction, arrangement of parts and method shown and described without departing from the spirit of the invention as expressed in the accompanying claims. I, therefore, do not wish to be limited to the exact details of construction, arrangement of parts and method shown and described, as one form only is given by way of illustration of the invention.

Referring to the drawings:

Figure I is a top plan view of a lighter embodying the invention;

Figure II is a longitudinal sectional view taken as on line II—II of Figure I; and

Figure III is a fragmentary perspective view of the flint holding and feeding mechanism, showing the parts in disassembled relation with each other.

Referring more particularly to the drawings, wherein like characters of reference designating like parts throughout the several views, the device embodying the invention comprises a main support 4 having a cylindrical bore 5 therein in which the flint supporting and feed mechanism of the invention is adapted to be positioned. The main support further has a conventional chamber 6 therein in which the wick 7 is adapted to extend. The chamber 6 is provided with the usual fluid retaining filler 8 such as cotton batting or similar means and is provided with the usual communicating opening 9, through which the wick 7 extends. A plug 10 is provided in the lower portion of the chamber which may be removed for placing lighter fluid in said chamber.

The support 4, fluid chamber 6, wick 7, etc. may be of any of the known conventional types, and are shown only for the purpose of illustrating one embodiment of the invention.

The arrangement to which the invention is particularly directed embodies a tubular member 11 having a longitudinal slot 12 therein. The tubular member 11 is frictionally pressed within the cylindrical bore 5 of the main support 4 and the longitudinal slot 12 forms a keyway for a pin 13 carried by a plunger 14. The plunger 14

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is positioned centrally of a coil spring 15 which is rotatably positioned within the tubular member 11. The plunger 14, through the thread connection of the pin 13 with the coils of the spring member 15, is adapted to be moved longitudinally of said spring member through the rotation thereof. The coil spring 15 is secured adjacent its lower end to attachment means 16 having a threaded portion 17, by means of a downwardly extending portion 18 formed on the said coil spring and which is adapted to extend within an opening 19 formed in said attachment member 16, or may be secured to the upwardly extending projection 20, formed integrally with said attachment means 16, as by soldering, welding, or the like.

The cylindrical bore 5, adjacent the lower end thereof, has a circumferential groove 21 communicating therewith and in which the threaded portion 17 of the attachment means 16 is adapted to move after being threaded in an upward direction through the threaded bore 22 formed in the base of the member 4 and in alignment with the cylindrical bore 5. The tubular member 11 is of a controlled length which is such as to position its lower edge 23 in substantially flush relation with the upper wall of the circumferential groove 21 when the upper end 24 thereof is seated against a shoulder 25 formed at the upper end of the cylindrical bore 5. The cylindrical bore 5, adjacent the upper end thereof, communicates with a frusto-conical portion 26 which in turn communicates with an opening 27 through which a flint member 28, which is one of a plurality of such flint members positioned within the confines of the coil spring 15, extends. The flint member 28, extending through said opening 27, is adapted to engage with a sparkwheel 29. The sparkwheel 29 is pivotally attached at 30 to spaced bearing supports 31 in the conventional manner.

The attachment member 16 is provided with a slot 32 which may be engaged by a suitable tool, such as a screw driver, coin or the like, by which the said member 16 and in turn the coil spring 15 may be rotated.

The upwardly protruding integral portion 29 is provided with a central bore in which is positioned a relatively short auxiliary spring member 33, the function of which will be described more in detail hereinafter.

The assembled relation and operative function of the device is substantially as follows:

Keeping in mind the tubular member 11 having the longitudinal slot therein and which is frictionally or resiliently secured within the bore 5 of the main support 4, the coil spring 15 which is operatively connected to the attachment member 16 and its associated parts, functions as a detachable unit. Prior to positioning the coil spring 15 inwardly of the tubular member 11, the plunger 14, having the pin 13 extending outwardly of the side thereof is first threadedly connected with said coil spring 15 to a position compressively engaging with the auxiliary spring 33. A plurality of flint members 28 are positioned in stacked relation with each other internally of the coil spring 15, as shown best in Figure II. The complete assembly which now comprises the attachment means 16, coil spring 15 which is secured with said attachment member 16 by the downward extending member 18 and which may be anchored in position by soldering or welding, plunger 14 which is threadedly connected with in the coil spring 15 by the pin member 13, and

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the plurality of flint members 28 are now inserted inwardly of the tubular member 11 with the pin 13 lying within the longitudinal slot 12. The threaded portion 17 of the attachment member 16 is then threaded upwardly of the threaded bore 22 an amount sufficient to position the threaded portion 17 within the circumferential groove 21, in which position the said attachment means 16 and coil spring 15 are free to rotate while held in said position and against displacement from the circumferential groove by the threads of the bore 22. It is particularly pointed out that the threads 17 on the attachment means 16 are so few in number that they may be positioned internally of the circumferential groove 21, for free rotary movement, after the connection means has been positioned in assembled relation with the main support 4. The auxiliary spring 33, when the flint assembly is first positioned within the tubular member 11, functions to initially exert a yielding upward movement on the plunger 14, which in turn urges the plurality of flint members upwardly an amount sufficient to yieldingly force the exposed flint member 28 into engagement with sparkwheel 29. The amount of pressure exerted by the auxiliary spring 33 may be initially controlled or limited by threading the plunger 14 downwardly against the spring 33, keeping in mind that the spring 33 has a tension which is greater than that initially required to move the flint members upwardly into engagement with the sparkwheel. The purpose of the auxiliary coil spring 33 is to introduce the initial yielding function required to yieldingly hold the exposed flint member 28 into engagement with the sparkwheel 29, when the plunger 14 is at its initially lowermost position and sufficient resiliency of the coil spring 15 cannot be brought into play. As the exposed flint member 28 is being worn away by the sparkwheel, added function of the auxiliary resilient means 33 may be brought into play by slightly adjusting or threading the plunger 14 in an upwardly direction. This permits the auxiliary spring 33 to function cooperatively with the coil spring 15 in yieldingly urging the flint members in an upwardly direction and provides means whereby the upward pressure of the exposed flint member 28 on the sparkwheel may be controlled so that the said sparkwheel may be freely manually rotated without any undue binding.

As the first flint member is spent, and the second or subsequent members are moved upwardly into engagement with the sparkwheel 29, the coil spring 15, which also functions as thread means for moving the plunger 14 upwardly, comes into play to then yieldingly press or hold the flint members into engagement with said sparkwheel. The coil spring 15, subsequent to the initial function of the auxiliary spring 33, now not only functions as thread means for moving the plunger 14 upwardly but also functions to yieldingly hold the exposed flint member 28 in engagement with the sparkwheel and the yielding pressure may be governed by proper adjustment of said coil spring 15 through rotation of the connection means 16 clockwise or anti-clockwise while exerting a pressure on said member 16. It is quite obvious that with the arrangement described herein, a plurality or battery of flint members may be initially positioned within the coil spring 15 and may be successively fed upwardly into engagement with the sparkwheel as each respectively exposed flint member has performed the full extent of its usefulness. When it is de-

sired to remove the assembly from the main support 4, all that is required is to rotate the attachment member 15 anti-clockwise wherein the coil spring 15, tending to return to its initial set, will cause the threaded portion 17 to engage with the threads of the bore 22 and permit the attachment means 16 to be threaded outwardly of said bore and thereby permit the entire assembly to be removed from the tubular member 11. When performing this latter function, no pressure is exerted upon the connecting means 16.

The frustra conical portion 16 functions to freely guide the successive flint members into alignment with the opening 27 as they are successively moved upwardly.

From the foregoing description, it will be seen that simple, efficient and economical means and method have been provided for supporting and successively feeding a plurality of flint members upwardly into engagement with the sparkwheel of the lighter and that a lighter having a greater longevity of function has been provided wherein the resilient pressure of each of said flint members moved successively into operative position may be definitely controlled.

Having described my invention, I claim:

1. In a device of the character described the combination of a main support having a hollow bore therein and means for resiliently supporting and feeding a plurality of members longitudinally of said bore, said means comprising a tubular member having a longitudinal slot therein and adapted to be positioned and supported in said bore, a coil spring in said tubular member, a plunger in said coil spring having a pin threaded with the coils of said spring and having a portion extending within the longitudinal slot of the tubular member, said main support having the hollow bore therein being formed with an enlarged circumferential groove communicating with the lower end of said bore and having a threaded opening of a smaller diameter than the circumferential groove beneath and communicating with said circumferential groove and said coil spring having attachment means secured to the lower end thereof formed with a threaded section adapted to be threaded in one direction through the threaded opening to a position within said circumferential groove whereby said threaded section may be continuously rotated in said direction and the coil spring secured thereto may be simultaneously rotated and held against displacement from said hollow bore by the threads of the opening communicating with the circumferential groove.

2. In a device of the character described the combination of a main support having a hollow bore therein, an enlarged circumferential groove adjacent the lower end of the bore and a threaded bore section beneath the circumferential groove and communicating therewith, and means for resiliently supporting and feeding a plurality of flint members longitudinally of said bore, said means comprising a tubular member having a slot extending longitudinally thereof, said tubular member being pressed and frictionally held in intimate relation with the inner side walls of said bore longitudinally thereof above the circumferential groove, a coil spring rotatably and compressibly supported in said tubular member, a plunger slidably mounted in said coil spring having a pin on the side thereof threaded with the coils of said spring and having a portion extending within the longitudinal slot of the tubular member for moving said plunger upwardly

or downwardly when the spring is rotated, said plunger being in direct contact with an adjacent flint member to be fed longitudinally of said bore and being resiliently urged in an upward direction by that portion of the coil spring beneath the pin when the plunger is threaded in an upward direction whereby the tension of said resilient member on said plunger may be varied according to the upward movement of said plunger and attachment means connected with the lower end of the coil spring and having a threaded portion adapted to be threaded through the threaded bore section to a position internally of the circumferential groove wherein said attachment means may be continuously rotated in said direction and will cause said attachment means to retain the parts in assembled relation with each other while permitting rotation of the coil spring in said direction and rotation of said attachment means in an opposite direction will permit the said means to be threaded outward to permit the parts to be disassociated with each other.

3. In a device of the character described, the combination of a main support having a hollow bore therein and means for resiliently supporting and feeding a plurality of members longitudinally of said bore, said means comprising a tubular member having a longitudinal slot therein adapted to be positioned and supported in said bore, a coil spring in said tubular member, a plunger in said coil spring having a pin threaded with the coils of said spring and having a portion extending within the longitudinal slot of the tubular member, said main support having a hollow bore therein being formed with a circumferential groove of a diameter larger than the diameter of the bore and communicating with the lower end of said bore and having a threaded opening of a diameter less than the diameter of the circumferential groove located beneath said groove and communicating therewith, said coil spring having attachment means secured to the lower end thereof formed with a threaded section adapted to be threaded in a direction inwardly of the threaded opening to a position within said circumferential groove whereby continued movement in said direction will permit continuous rotation of said attachment means and simultaneous rotation of the coil spring in said direction with the said attachment means being held against displacement of said hollow bore by the threaded portion thereof and the threads of the threaded opening and a relatively short coil spring of a diameter less than the first mentioned coil spring positioned internally thereof and engaging the inner adjacent end surface of the attachment means, said relatively short coil spring being adapted to engage the lower end surface of the pin only when said pin is moved to a position adjacent its lowermost position of use.

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