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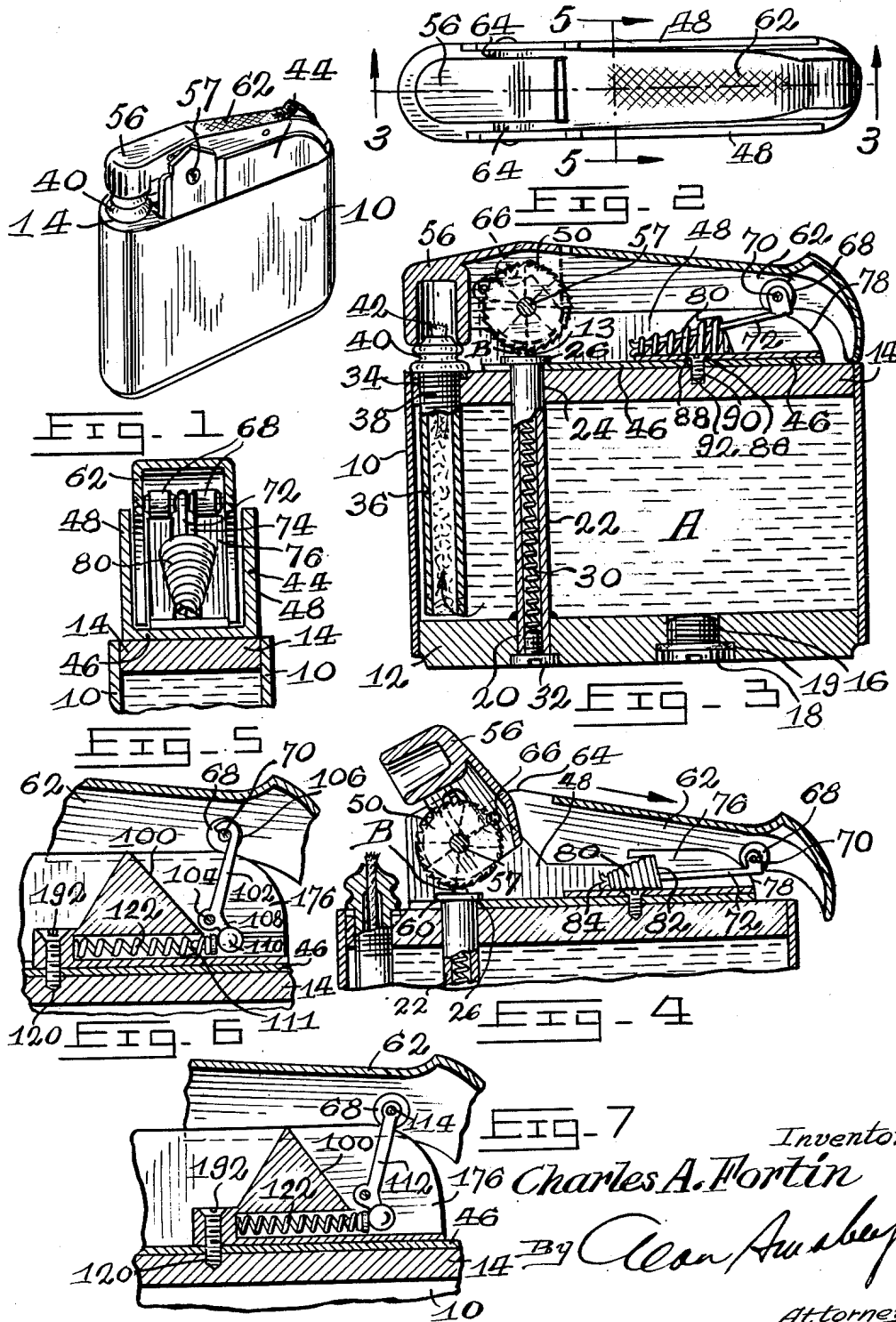
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2,594,631

LIGHTER

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2 SHEETS—SHEET 1



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2 SHEETS—SHEET 2

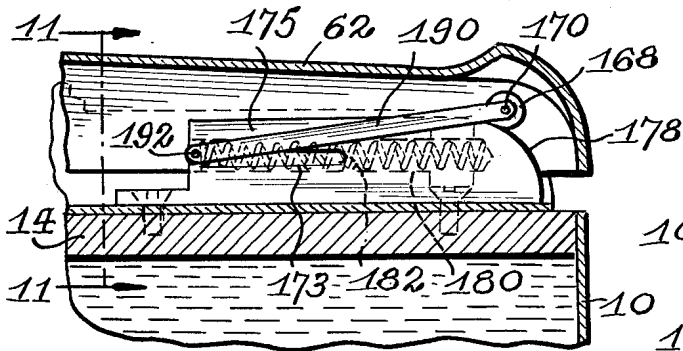


Fig. 8

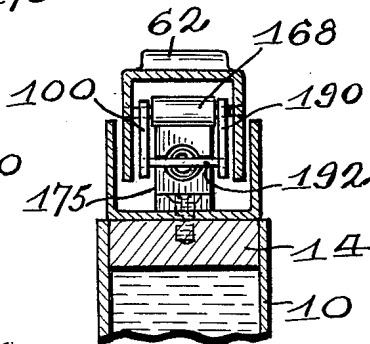


Fig. 10

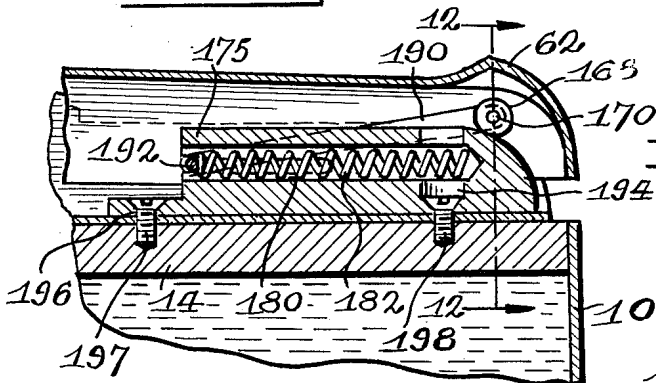


Fig. 9

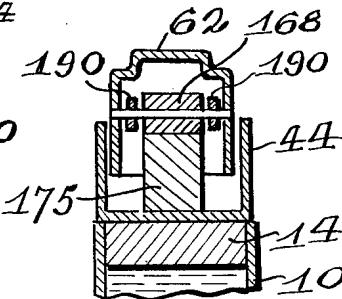


Fig. 11

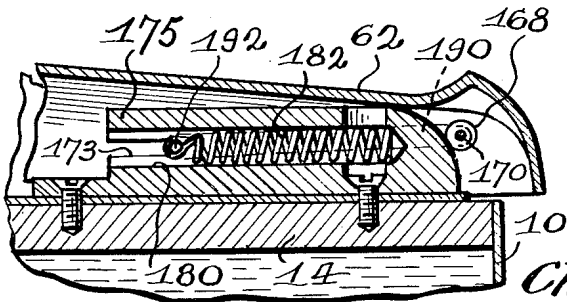


Fig. 12

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UNITED STATES PATENT OFFICE

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LIGHTER

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1 Claim. (Cl. 67—7.1)

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Introduction

This invention relates to automatic pyrophoric lighters for cigarettes or cigars.

There have been many designs proposed for lighters of this type and many patents granted. Many of these lighters are most serviceable, but they possess certain disadvantages in the mechanism, making them difficult to manufacture and in some cases difficult to operate.

One of the more common disadvantages of prior designs is that they are difficult to operate. One type depends on straight downward pressure of the thumb. In this type, the thumb pressure acts directly against the spring pressure. The more you press the greater the resistance of the spring. This means that the lighting movement instead of being accelerated towards the end of the stroke is slowed up by the increasing resistance of the spring.

Other lighters have a diagonal movement which is more horizontal than vertical. In this type, the return spring for the actuating lever is highly subject to breaking or else if the spring is not strong enough it will not return the lever to closed position.

Applicant's development

The applicant has now developed a lighter which avoids the disadvantages of both types, but possesses their advantages.

Accordingly, the present invention is a pyrophoric lighter having in combination with a fuel reservoir, a wick extending from the reservoir, an abrasive wheel rotatably mounted above the reservoir, and a pyrophoric member resiliently maintained in contact with the abrasive wheel, a pivotally mounted actuating lever adapted to rotate the abrasive wheel, and means whereby the actuating lever is guided downwardly and rearwardly upon depression and is resiliently returned to its original position in a forward and upward movement.

More specifically, a preferred construction of a lighter in accordance with the invention includes a hollow casing having a base portion and a top portion so as to constitute a fuel reservoir with the lighting mechanism mounted on top of the casing. This lighting mechanism includes a wick tube and a flint tube that extend within the casing body with the wick and flint protruding from the top portion. A substantially U-shaped bridge member is removably mounted on the top portion that includes a base portion and upstanding side walls extending from the base portion and an abrasive wheel and a snuffer

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cap are rotatably mounted on a common horizontal shaft between the upstanding side walls, the abrasive wheel being mounted so as to contact the flint extending from the casing.

The actuating lever of the lighter is of a substantially U-shaped form in general cross section and includes a pair of extended side portions at the front end that are pivotally connected at each side to the snuffer cap, this pivotal connection being positioned above and forward of the axis of the abrasive wheel. A pair of spaced apart roller bearings are mounted on a shaft extending horizontally across the actuating lever adjacent the other end, and a cam block mounted on the base of the U-shaped bridge member is adapted to guide the roller bearings in a downward and rearward motion upon depression of the actuating lever. The cam block is divided centrally by a slot and a connecting rod pivotally mounted between the actuating lever roller bearings extends through this slot and is connected to a spring mounted in a recess in the rear of the cam block. With this arrangement the spring is compressed by the downward and rearward movement of the actuating lever so as to bear against the rear of the block and upon release of the lever is adapted to act against the connecting rod so as to raise the roller bearings forwardly and upwardly over the cam surfaces of the block so as to return the actuating lever to its original position. In an alternative arrangement of the actuating lever return means, the connecting lever between the roller bearings and spring is pivotally mounted on the cam block and a spring is inserted in a recess provided in the cam block so that an extended portion of the connecting lever bears against the spring and compresses it within the block when the actuating lever is depressed.

As a further alternative form of construction the double roller bearings are replaced by a single roller and the cam block is formed so as to have a substantially centrally disposed recess adapted to house a coil spring with the cam block slotted along both sides axially of the recess. The connection between the roller bearing and the spring is made by providing a pair of connecting lever arms that extend along the sides of the cam block. These lever arms are pivotally connected, one at each side to the roller bearing, the other end of the lever arms being connected by a pin extending across and adapted to slidably ride in the cam block slots so as to engage the end of the spring and compress it

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within the block when the actuating lever is depressed.

Detailed description

Having thus generally described the nature of the invention, particular reference will now be made to the accompanying drawings illustrating a preferred embodiment, and in which:

Figure 1 is a perspective view of a lighter constructed according to the invention.

Figure 2 is a top plan view of the lighter shown in Figure 1.

Figure 3 is a vertical cross section along the line 3—3 of Figure 2.

Figure 4 is a cross section view similar to that of Figure 3, showing the lever in intermediate position.

Figure 5 is a sectional view of Figure 2 along the line 5—5.

Figure 6 is a detail view of a portion of the lighter in section corresponding to Figure 3 and illustrating an alternative arrangement of the lever return linkage mechanism.

Figure 7 is a detail of a portion of the lighter in section corresponding to Figure 3 and illustrating a further alternative arrangement of the return linkage mechanism.

Figure 8 is an enlarged detail view of a portion of a lighter partially in section and corresponding to Figure 3 illustrating an alternative arrangement of roller bearing and lever return linkage mechanism in the uppermost or normal position.

Figure 9 is a detail view corresponding to Figure 8 illustrating the mechanism in intermediate operating position.

Figure 10 is a detail view corresponding to Figure 8 illustrating the mechanism at the end of the downward and rearward operating stroke.

Figure 11 is a sectional view along the line 11—11 of Figure 8.

Figure 12 is a sectional view along the line 12—12 of Figure 9.

Referring more particularly to the drawings illustrating a preferred construction of a lighter in accordance with the invention, the main body of the lighter is made up of a casing 10 having a base 12 and a top portion 14 press fitted into the ends of the casing 10 as shown so as to provide a reservoir A adapted to contain lighter fluid. The base 12 is bored and tapped to provide a threaded counterbored opening 16 and a threaded closure screw 18 having a suitable washer 19 is provided so as to provide a means of filling the reservoir A. The base 12 is also bored to provide a second opening 20 and a flint tube 22 having one end press fitted in this opening, extends through the reservoir A to a corresponding opening 24 provided in top portion 14. The end of the tube 22 extends slightly beyond the surface of the top portion 14 and is capped by an outstanding flange 26 through which the flint B protrudes when the lighter is in operative condition. The lower end of the flint tube 22 is threaded internally and a spring 30 and threaded screw 32 are provided so as to maintain the flint B in operative position.

The top portion 14 also includes a tapped opening 34 and a wick tube 36 having a threaded end 38 is engaged in this opening with the body of the tube 36 extending into the reservoir A. The threaded portion 38 of the tube 36 is slightly larger in diameter than the main body of the tube so that the wick tube can be easily inserted or removed from the casing 10 as required for servicing. The portion of the tube 36 extending

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above the top portion 14 is formed to provide a wick holder 40 from which the end of the wick protrudes as indicated at 42.

The operative portion of the lighter is mounted on a substantially U-shaped bridge portion 44 that includes a base portion 46 and flanges 48 which extend upwardly at each side from the base portion 46. Preferably, the flanges 48 are formed so as to accommodate the usual arrangement of an abrasive spark wheel 50, a ratchet spring, and a snuffer cap 56 these being operatively mounted on a shaft 57 rotatably mounted in the flanges 48 so that arcuate movement of the cap rotates the wheel 50. This portion of the lighter is common and is well known in the art.

The base 46 of the bridge portion 44 illustrated is provided with a centrally disposed U-shaped slot 60 which, when the bridge 44 is mounted on the top portion 14, is adapted to slidably fit under the flange 26 of the flint tube 22. If desired the side walls of the tube 22 can be slotted at each side so as to engage the base portion 46 at each side of the slot 60.

An actuating lever 62, having a substantially U-shaped form in general cross section, is mounted between the flanges 48 of the bridge 44 and includes extended end portions 64 which are pivotally connected at each side to the snuffer cap 56 as indicated at 66. A pair of spaced apart roller bearings 68 are rotatably mounted adjacent the rear end of the lever 62 on a shaft 70 which extends across the lever. Between the rollers 68 and connected pivotally to the shaft 70 is a rod which passes through a slot 74 formed in a cam block 76.

The cam block 76 is formed so as to provide the curved cam surfaces 78 adapted to guide the travel of the rollers 68 with the slot 74 centrally disposed so as to allow the rod 72 to pass between both sides of the block. The end of the rod 72 remote from the shaft 70 is connected to a cone shaped coil spring 80 which bears against a recess 82 provided in the inner surface of the block 76. In the embodiment illustrated the end of the rod 72 is split and bifurcated as indicated at 84 to retain the rod 72 in engagement with the spring. Alternatively the end of the rod 72 could be screw threaded and provided with a spring retaining nut.

An opening 86 is provided in the base portion of the block 76 and a corresponding opening 88 is provided in the base 46 of the bridge 44. These openings are adapted to register with a tapped opening 90 in the top portion 14 when the U-shaped slot 60 is slidably engaged with the end of flint tube 22 and a screw 92 is inserted through these openings so as to retain the block 76 and the bridge portion 44 to the head 20. This arrangement makes the removal of the entire top portion of the lighter a simple matter. By merely removing the screw 92 and sliding the bridge 44 back so as to clear the slot 60 from engagement with the end of the wick tube 22 the whole top including the snuffer cap 56, the lever 62, and the actuating mechanism including the cam block 76 can be lifted from the main body of the lighter.

An alternative construction of the cam block 76 and lever return spring means is shown in Figure 6. In this embodiment the cam block 176 is not slotted clear through but is recessed as indicated at 180 to provide clearance for the movement of a connecting rod 102 pivotally connected to the block as indicated at 104. The upper end of the rod 102 is provided with a hook portion

196 adapted to engage the shaft 70 centrally of the rollers 68, and the lower end includes an offset extension 108 terminating in a bulbous end 110. In this form of the device the cam block 170 is bored to provide the recess 111 and a spring 122 is mounted within this recess so as to act against the end 110 of the rod. In this construction a screw 192 passes through the block 176, and the base 46 of the bridge 44 and is threadably engaged in the top portion 14 as indicated at 120. Figure 7 illustrates an alternative connecting rod 112 in which the rod end 114 is formed so as to provide an opening through which the shaft 70 passes to form a pivoted connection, this connection being made centrally of the rollers 68 as in the previous constructions.

With particular reference to Figures 8 through 12 of the drawings, a further alternative form of construction is illustrated in which the roller bearings 68 are replaced by a single roller bearing 168 mounted for rotation on a shaft 170 extending across the actuating lever 62. The cam block 175 used in this form of the device includes a curved cam surface 178 adapted to guide the travel of the roller bearing 168 and a substantially centrally disposed recess 180 adapted to accommodate a coil spring 182. The cam block 175 also includes slots 173 extending along each side axially of the recess 180 and a pair of connecting lever arms 190 disposed at each side of the block 175 are pivotally connected at one end adjacent the roller bearing 168 with the other ends retained in spaced apart relationship by a pin 192 adapted to extend across and slidably ride in the cam block slots 173 so as to engage the end of the spring 182.

With this arrangement the downward and rearward travel of the roller bearing 168, as caused by the depression of the actuating lever 62, is transmitted through the lever arms 190 sliding the pin 192 along the cam block slots 173 and compressing the spring 182 within the cam block. The cam block 175 is provided with openings 194 and 196 so that it may be removably secured to the bridge portion 44 and top portion 14 of the lighter casing by means of screws 197, 198 in the same manner as previously described.

Operation

In use the lighter is operated by pressing the lever 62 downwards causing it to retract in a rearward and downward direction, the cam surfaces of the cam block acting as a track on which the rollers 68, or 168 ride, and so guide the lever 62 in its downward and rearward path. As the end portions 64 of the lever 62 are pivotally connected to the pivotally mounted snuffer cap 56, the cap 56 is lifted in an arcuate movement causing rotation of the flint wheel 50 against the flint B causing the sparks which light the wick. Upon release of the lever 62 it is returned to its

original position by means of the spring 80 or in the alternative arrangements, the spring 112 or 182 so that the snuffer cap 56 descends over the wick extinguishing the lighter.

As will be understood by the preceding explanation and the accompanying drawings, a lighter constructed in accordance with the present invention provides an actuating movement that is positively guided in a downward and rearward movement calculated to give a full stroke to the flint wheel with the minimum of operating pressure, and further provides a structure in which the lever return spring is under levered compression rather than direct compression as is common in prior art lighters of this nature.

I claim:

In a pyrophoric lighter, a casing constituting a fuel reservoir, a U-shaped bridge member mounted on said casing including a base portion and upstanding side flanges extending from said base portion, an abrasive wheel mounted for rotation in a horizontal axle between said upstanding flanges, a snuffer cap pivotally mounted on said abrasive wheel axle, means operatively connecting said snuffer cap with said abrasive wheel, an actuating lever pivotally connected to said snuffer cap above and forward of said abrasive wheel axle, a roller bearing mounted for rotation on a shaft extending across said actuating lever adjacent the end remote from said snuffer cap, a cam block having a roller guiding surface and an internal recess mounted on said U-shaped bridge member base, said cam block being provided with elongated slots extending axially at each side of said cam block recess, a coil spring seated in said cam block recess, and a pair of spaced apart elongated links extending along each side of said cam block, each of said links being pivotally connected at one end to said roller bearing shaft, a pin mounted between the other ends of said elongated links remote from said roller bearing shaft said pin slidably fitting in said cam block slots and extending across said cam block recess so as to engage the outer end of said coil spring seated therein.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,492,471	Farmer	Dec. 27, 1949

FOREIGN PATENTS

Number	Country	Date
583,773	Great Britain	Dec. 30, 1946
616,079	Great Britain	Jan. 17, 1949
731,788	France	May 31, 1932