

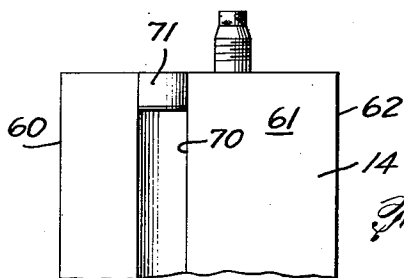
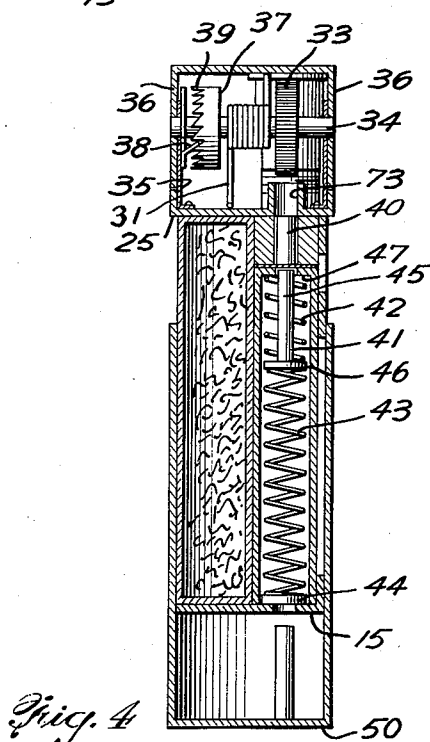
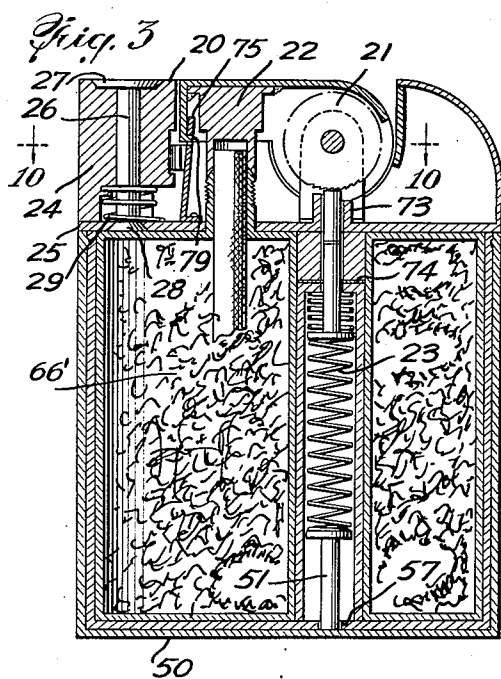
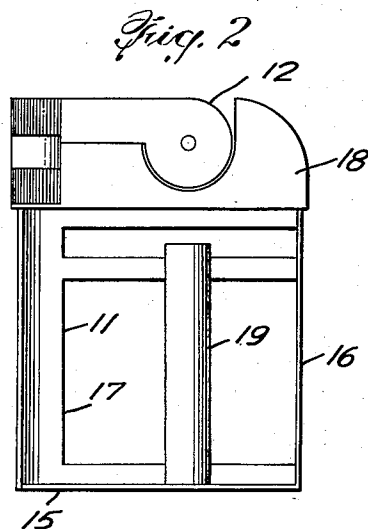
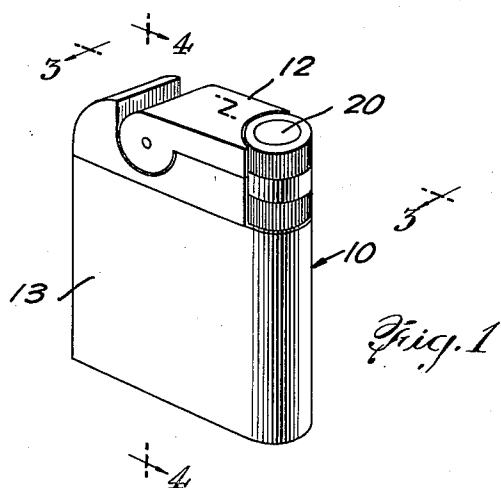
Aug. 26, 1952

J. SIMON ET AL
CIGARETTE LIGHTER

2,608,080

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4 Sheets-Sheet 1



INVENTORS
Justin Simon
Richard S. Temko

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Fig. 6

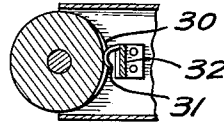
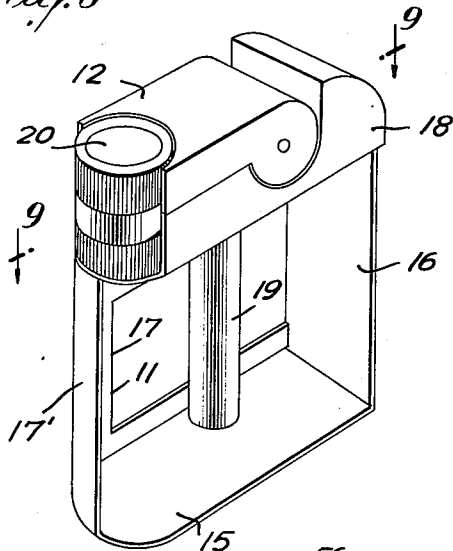


Fig. 10

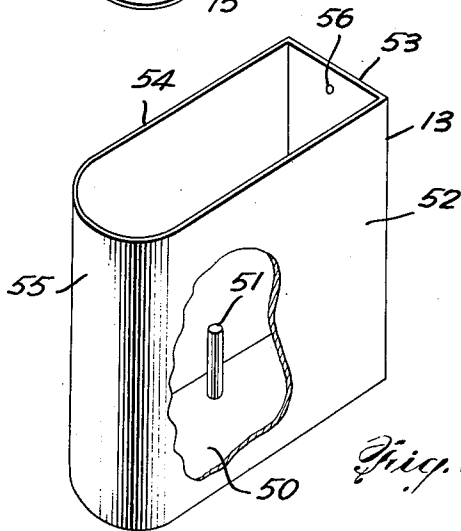


Fig. 8

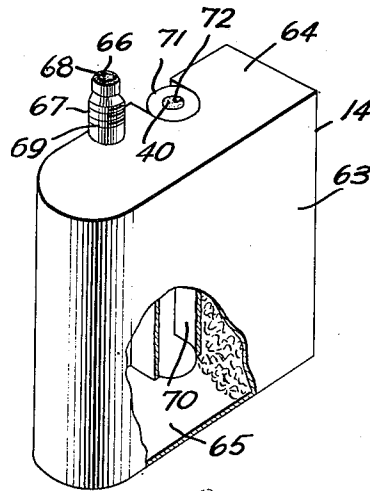


Fig. 7

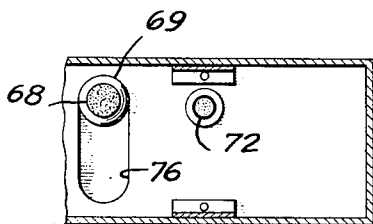


Fig. 9

INVENTORS
Justin Simon
Richard S. Temko

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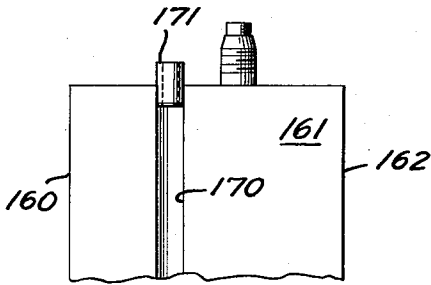


Fig. 11

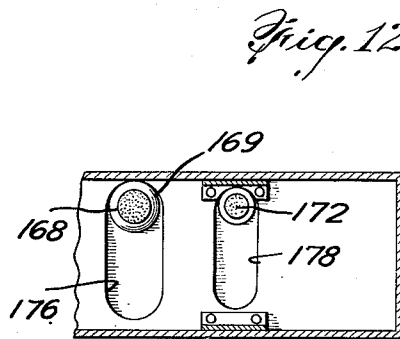


Fig. 12

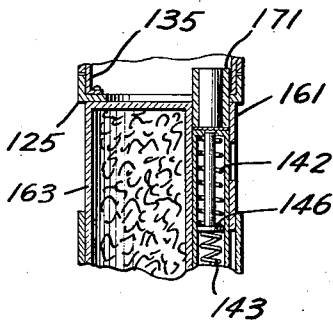


Fig. 13

John Simon INVENTORS
Richard S. Temko

Aug. 26, 1952

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Fig. 14

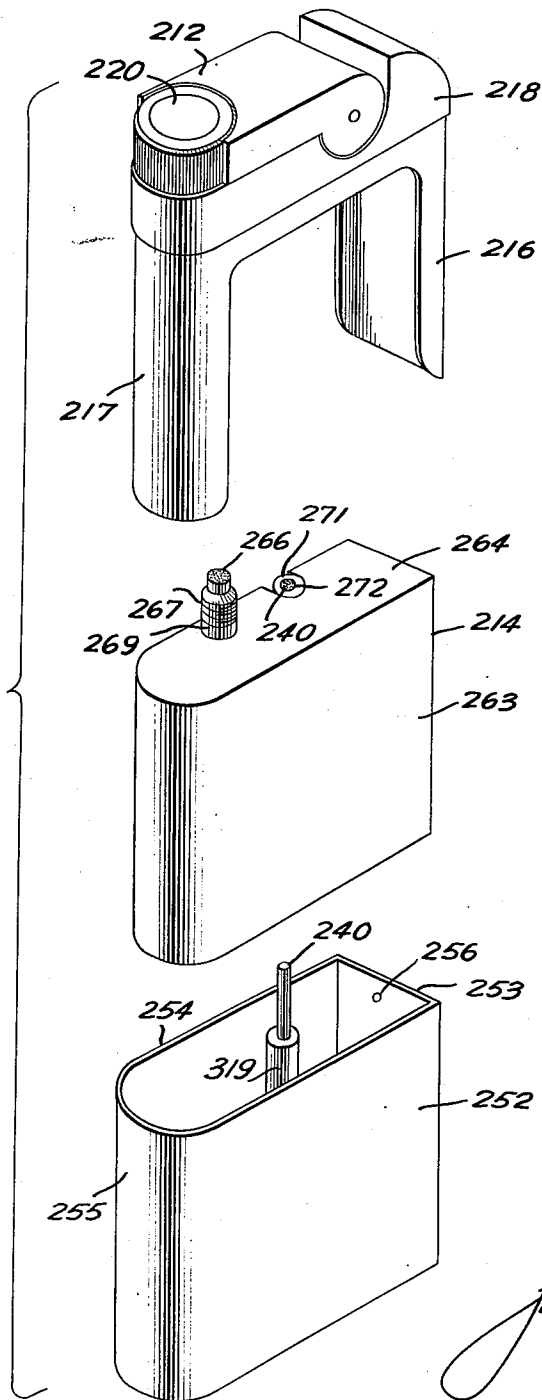
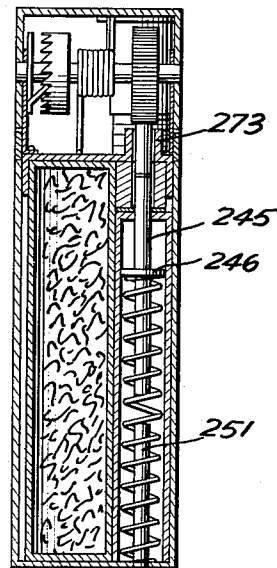


Fig. 15



INVENTORS

Justin Simon
Richard S. Temko

UNITED STATES PATENT OFFICE

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CIGARETTE LIGHTER

Justin Simon, Woodmere, and Richard S. Temko,
New York, N. Y.

Application October 5, 1949, Serial No. 119,682

2 Claims. (Cl. 67-7.1)

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This invention relates generally to cigarette lighters, and more particularly to a cigarette lighter in which the fuel, flint, and wick are replaced as a unit in the form of a disposable cartridge when these consumable elements are used up.

Reference is made to our co-pending application Serial No. 688,068, now matured to Patent No. 2,541,111, this application being a continuation-in-part of that application.

In view of prior improvements in the art to which the present invention relates, lighters have become relatively fool-proof in operation, but are open to the disadvantage that any one of the consumable elements therein, namely, the wick, flint, and fuel may give out at a time when least expected. In accordance with the present invention the consumable elements are correlated so that the fuel becomes entirely consumed at substantially the same time or slightly before the flint is consumed. The wick is so set that the exposed portion thereof is adequate for the entire burning period permitted by the quantity of fuel in the cartridge.

It is, therefore, among the principal objects of the present invention to provide a novel and useful cigarette lighter construction in which when the fuel, wick, or flint has been consumed, it is a relatively simple operation to remove a cartridge containing all three of these elements to discard the same and to replace it with a new cartridge.

Another object herein lies in the provision of a device of the class described, which is substantially leak-proof both while being stored prior to use and during use.

Another object herein lies in the provision of a cartridge and cigarette lighter casing construction in which the consumed cartridge may be quickly and conveniently replaced with a new one by the user without tools, or special skill.

These objects and other incidental ends and advantages will more fully appear in the progress of this disclosure and be pointed out in the appended claims.

In the drawings similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a view in perspective of a first embodiment of the invention.

Figure 2 is a view in elevation of the first embodiment, the casing element of which has been removed to show details of inner structure.

Figure 3 is an enlarged vertical sectional view of the device as seen from the plane 3-3 on Fig-

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ure 1. In this view the device is shown with a removable cartridge in operative position.

Figure 4 is an enlarged transverse vertical sectional view as seen from the plane 4-4 on Figure 1. In this view the casing element is in a partially closed position thereof showing a stage of the loading procedure.

Figure 5 is a fragmentary enlarged elevational view of a replaceable cartridge showing the flint carrier.

Figure 6 is an enlarged view in perspective in which the casing element of the device has been removed to show details of structure.

Figure 7 is an enlarged view in perspective of the removable cartridge element, partly broken away to show details of internal construction.

Figure 8 is an enlarged view in perspective of the casing element of the device, partly broken away to show the activating pin mounted thereon.

Figure 9 is an enlarged fragmentary horizontal sectional view, as seen from the plane 9-9 on Figure 6.

Figure 10 is a fragmentary horizontal sectional view corresponding to the lefthand portion of Figure 9.

Figure 11 is an enlarged fragmentary elevational view of a cartridge element for use with a second embodiment of the invention.

Figure 12 is an enlarged fragmentary sectional view of the second embodiment, corresponding generally to Figure 9.

Figure 13 is an enlarged fragmentary sectional view of the second embodiment corresponding generally to Figure 4.

Figure 14 is an enlarged exploded view of a third embodiment of the invention, including a replaceable cartridge element.

Figure 15 is an enlarged vertical transverse sectional view, corresponding generally to Figure 4.

Turning now to the first embodiment, in accordance with the invention, the device generally indicated by reference character 10, includes broadly a cartridge retaining element 11, having thereon an ignition means 12, a casing element 13, and a replaceable cartridge element 14.

The cartridge retaining element 11, comprises a bottom wall 15, and vertical walls 16, 17 and 17'. These are suitably secured at the upper portion thereof to a housing 18 which encloses the ignition means 12. A tubular member 19, generally circular in cross section encloses the flint actuating element 23, as will be more clearly seen later.

The ignition means 12 may be of any suitable construction, as for example that shown on Figures 3 and 4. It includes a releasing element 20, striking element 21, the latter of which incorporates a snuffer member 22, and flint actuating element 23.

The releasing element 20, as may be best seen on Figure 3, comprises a pivotal trigger member 24 suitably secured to the lower wall 25 of the housing 18, by a shaft 26 having enlarged portions at the extremities 27 and 28. A small torsion spring 29, resiliently connects the trigger member 24 with the lower wall 25, and normally urges the member 24 in a counterclockwise direction as seen from Figure 1. A crescent shaped groove 30 (Figure 10) is provided in member 24 in which the contact portion 31 of the sear 32 is normally disposed.

The striking element 21 includes a toothed striking wheel 33, rigidly secured to a rotatable shaft 34. A pair of brackets 35 provides a mounting for the shaft 34 which as may be seen on Figure 4 may also project through the walls 36 of the snuffer member 22. Unidirectional drive is obtained between the snuffer member 22, and the shaft 34 by means of the clutch wheel 37 which engages a resilient tab 38 on the member 22. Thus when the snuffer member 22 rotates in a clockwise direction as viewed on Figure 3, the tab 38 will engage one of the projections 39 on the clutch wheel 37, thereby causing the snuffer member 22 to move with the toothed wheel 33. When the snuffer member 22 is moved in a counterclockwise direction, however, the resiliency of the tab 38, permits it to ride over the projections 39. This construction assures the confining of the motion of the wheel 33 to that in a clockwise motion as seen in Figure 3, needless wear on the flint 40 being avoided thereby. A torsion spring 31, coaxial with shaft 34 provides torque to normally rotate the snuffer member 22 to an upright position, thereby striking the flint 40, when the member 22 is released.

The flint actuating element 23, as has been mentioned is disposed substantially within the tubular member 19. It comprises a follower 41, a safety spring 42 of a relatively small modulus, an actuating spring 43, of a relatively greater modulus, and a contact member 44, which is generally in the form of a thin circular disk. The follower 41 includes a shaft 45 of predetermined length and diameter, and a flat disk portion 46, against which one terminus of both springs, 42 and 43 may act.

The spring 42 is maintained in position within the tubular member 19, by the upper wall 47, while the spring 43 is similarly maintained by the contact of the contact member 44 with a portion of the bottom wall 15, of the cartridge retaining element 11. The operation of the flint actuating element 23 will be described more fully in a later portion of the disclosure.

The casing element 13 (Figure 8) is removable from the device by sliding it downwardly away from the housing 18. It includes a bottom wall 50 upon which is secured an actuating pin 51, disposed such that it is coaxial with the tubular member 19 when the casing element is positioned on the device; and vertical walls 52, 53, 54, and 55. Although we have shown the wall 55 as having a curvilinear surface, it will be readily understood that this is by way of forming a pleasing appearance, a rectilinear surface being also suitable. On the inner surfaces of the walls 53 and 55 there is provided a pair of detents 56, engage-

able with corresponding depressions on the cartridge retaining element 13. A small orifice 57 in the bottom wall 15 permits entry of the pin 51 when the casing element is in operative position.

The replaceable cartridge 14 may be best seen on Figures 5 and 7. As this element of the device is intended to be expendable, it is desirable that it be fabricated at as low a cost as possible. We have found structure similar to that utilized in the well known "tin can" to be suitable. Thus the vertical walls 60, 61, 62, and 63, may be formed from a single strip of sheet steel lapped on a single line (not shown) in one of the walls. The top portion 64 and the bottom portion 65, may be then secured in a well known manner. The cotton filling 66', wick 66, and fuel (not shown) may be inserted through a small opening (not shown) which is later sealed, or may be inserted before the top portion 64 is completely secured in position.

Secured to the upper surface of the top portion 64 is a wick retaining sleeve 67, having a bore 68 substantially equal to the diameter of the wick 66. To prevent evaporation of the fuel through the wick before the cartridge is in use, the outer surface 69 of the sleeve 67 is threaded to receive a cap (not shown). This cap may be removed immediately before inserting the cartridge into the cartridge retaining element 11.

Disposed in the vertical wall 61 is a channel 70, which as may be seen on Figure 7 extends through the top and bottom portions 64-65. The channel is substantially semicircular in cross section to enable the cartridge to fit about the tubular member 18. Attached to the surface of the groove or channel 70 at the uppermost portion thereof is a flint carrier member 71, disposed so that the upper surface thereof lies in the plane of the top portion 64. The flint 40 is disposed in a bore 72, which is preferably of an internal diameter substantially equal to the diameter of the flint 40. The flint is retained in position by means of a frangible support member 74 preferably formed from thin paper, and carrying adhesive, which paper may be readily punctured by the shaft 45, as will more fully appear. It may be mentioned at this time that the tubular member 19 does not extend to the housing 18, but terminates at a point below the housing a distance sufficient to allow the flint retaining member to be disposed therebetween when the cartridge element 14 is inserted into the cartridge retaining element.

Operation

Assuming the lighter to be in a condition wherein recharging is necessary, the device is grasped firmly at the housing 18. With the other hand a force is applied to the casing element 13, sufficient to dislodge the detents 56, after which the element may be easily slid from the cartridge retaining element. By inserting the fingers through the opening in the wall 17 the exhausted cartridge may be readily dislodged and removed. The replacement cartridge is then prepared for insertion by removing the protecting cap from the sleeve 67. The cartridge is then inserted as shown on Figure 4. At this point the sleeve 67 is positioned beneath the snuffer member 22 and the flint carrier beneath the flint guide tube 73. Positioning of the cartridge is facilitated by the elongated slot 76 in the lower wall 25 through which the sleeve 67 passes.

The casing element 13 is then replaced by sliding upwardly until the detents 56 are again en-

gaged. The pin 51, has now entered the orifice 57 and contacted the member 44 (Fig. 4). The spring 43 is now under compression and as the modulus of the spring 43 is of a greater degree than that of spring 42 the latter spring is immediately compressed (Fig. 3). The follower 41 is thereby moved upwardly breaking the member 74 and resiliently propelling the flint 40 through the tube 73 whereby it may be positioned beneath the wheel 33 in a manner well known in the art. The lighter is then used in the ordinary manner until the cartridge is subsequently exhausted. Rotation of the trigger member 24 serves to trip the sear 32, thereby releasing the striking means 21. To extinguish the lighter the snuffer member 22 is manually returned to its original position whereby the projection 77 is re-engaged with the sear 32.

Turning now to the second embodiment, to avoid needless repetition, certain of the parts corresponding to those of the first embodiment have been designated by similar reference characters with the addition of the prefix "1."

As may be seen on Figures 11 to 13 inclusive, the second embodiment differs from the first embodiment, principally in the location of the flint carrier 171. In the second embodiment a portion of this member extends above the surface of the lower wall 125, thereby rendering unnecessary the presence of a guide tube 73. In order to provide facility in reloading, an elongated slot 178 is cut into the lower wall 125, to accommodate member 171.

Turning now to the third embodiment, to avoid needless repetition, certain of the parts corresponding to those of the first embodiment have been designated by similar reference characters with the addition of the prefix "2."

As may be seen on Figures 14 and 15, the third embodiment differs from the first and second embodiments principally in the structure of the cartridge receptacle element. In this embodiment the bottom wall 15 has been eliminated, and the walls 216 and 217' have been enlarged to provide a resilient force fit between the cartridge 214 and the cartridge retaining element 211. The wall 17 is therefore eliminated. Another important difference in the third embodiment is that the tubular member 319 is secured to the casing element 213 instead of to the cartridge retaining element 211. The shaft 245 may normally protrude (Fig. 14) and be urged by a single spring 243. Thus, after the cartridge 214 is pushed up into the retaining element, the casing element 213 is pushed up which moves the flint 240 up to the wheel 233 automatically.

It may thus be seen that we have invented a novel and highly useful improvement in cigarette lighters, in which there is provided a device in which all of the expendable elements may be simultaneously and conveniently replaced with a minimum of effort on the part of the user. By employing a cartridge containing all three of the

elements, which may be manufactured at a very low cost, the total operating expenses may be but very slightly above that of a conventional lighter. This small increase in operating cost is more than compensated for by increased convenience, and cleanliness in use.

We wish it to be understood that we do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

We claim:

1. Cigarette lighter construction comprising: a cartridge retainer element, a casing element, and a cartridge element; said cartridge element having a flint carrier positioned upon one surface thereof, said flint carrier having a hollow channel in which a lighter flint is disposed; first means maintaining said flint within said carrier; second means including a shaft of such diameter as to afford slidable entry into said channel; third means mounted upon the casing element, said third means including a second shaft; said second means being activated by positioning said cartridge element within said cartridge retainer element, and in turn positioning said cartridge retainer element within said casing element, whereby said third mentioned means may activate said second mentioned means; said first mentioned means being sufficiently frangible to rupture under pressure exerted by said second means, wherein said first mentioned shaft may enter said channel to urge said flint from said flint carrier.

2. A device as claimed in claim 1 in which the second mentioned means has first and second resilient components incorporated therein; one of said components serving to maintain said second mentioned means in an active position, the other of said resilient means being capable of overcoming the resiliency of said first resilient component through motion imparted by the shaft of said third mentioned means occurring when said cartridge retainer element is positioned within said casing element.

JUSTIN SIMON.
RICHARD S. TEMKO.

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