

PATENT SPECIFICATION



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490,758

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PROVISIONAL SPECIFICATION

Improvements in or relating to Electric Lighters for Cigars and the like

(A communication from CASCO PRODUCTS CORPORATION, of Bridgeport, Connecticut, United States of America, a Corporation organised under the laws of the State of Connecticut, United States of America.)
I, COLIN DEFRIES, Lt.-Col., of 69, Drayton Gardens, Fulham Road, London, S.W.10, a British Subject, do hereby declare the nature of this invention to be as follows:—

This invention is for improvements in or relating to electric lighters for cigars and the like and has for one of its objects to provide a construction which will be simpler and safer to use than are existing constructions.

The invention is concerned with electric lighters of the type in which the filament, which when electrically heated serves as the igniting means, is mounted in a holder which is detachably received in a housing carrying electrical contacts whereby when the holder is in place in the housing current may be passed through the filament to heat it and after the filament has been sufficiently heated the holder may be withdrawn for use in igniting a cigar or the like.

According to the primary feature of the present invention, there is provided an electric lighter of the type just described which embodies devices to retain the filament holder detachably in two alternative settings, in one of which settings the filament is electrically connected to the said contacts and in the other of which settings the filament is not electrically connected to the said contacts. It is preferred that the retaining devices shall be so located that the filament holder in entering the housing will first reach the second mentioned setting and must pass therefrom to reach the first mentioned setting and must return to the second mentioned setting before leaving the housing.

According to another feature of the invention, the device which detachably retains the filament holder in the first mentioned of said settings is influenced by the heating of the filament and automatically releases the holder when the filament has been heated to a predeter-

mined temperature. Conveniently the device which detachably retains the filament holder in the first mentioned of said settings comprises resilient electrical contact members which are adapted to grip the holder for the purposes of retaining it detachably and completing the electrical circuit through the filament. The said contact members may be responsive to heat and by reason of temporary deformation, expansion and/or temporary loss of resilience release the grip on the filament holder when the filament has been heated to a predetermined temperature. The filament may be located in such a position in its holder that when the latter is in the first mentioned of said settings the filament is closely adjacent to the said contact members. In this way if the contact members are not themselves heated by the passage of current they will receive heat from the filament.

In a convenient construction according to the invention the filament holder is inserted in and removed from the housing in the direction of the length of the holder and is formed in two main portions which within limits are slidable the one relatively to the other lengthwise of the holder, of which main portions one carries the filament and the other engages the housing in such manner as to determine the second mentioned setting, and which two portions have between them a spring which resists movement of the filament-carrying portion of the holder from the second mentioned setting towards the first mentioned setting and tends to return it from the latter towards the former.

The filament holder is preferably tubular and has at one end the filament and at the other end a closure including a window through which light from the filament when glowing will pass.

From the foregoing it will be understood that when the lighter is not in use the filament holder will be carried in the housing in the second mentioned of the said settings. In this setting the filament will remain cold. When required for use the operator will press upon an exposed portion of the filament holder,

[Price 1/-]

this being the portion which carries the filament as described above, and will cause it to move lengthwise into position to be gripped by the aforesaid resilient contacts. These will retain it in the first mentioned of the said settings and the filament will be heated. By the time it is sufficiently hot to be used the resilient contact members will have become heated sufficiently for them automatically to release the filament-carrying portion of the filament holder and the latter will then, under the influence of the spring which is between it and the other filament holder portion, move lengthwise in the outward direction carrying the filament away from the electrical contacts. The filament holder may now be detached by the operator and used and if the operator does not happen to notice that the filament holder has moved in the manner just described he will nevertheless have his attention directed to the fact that the filament is heated ready for use because he will be able to see the light through the aforesaid window. If, for any reason, the filament holder is not detached from the housing the filament will cool and no damage will be caused nor will current be wasted.

It will be appreciated that the lighter according to the present invention embodies thermostatic control. The resilient contact members aforesaid may themselves be made of thermostatic or bimetallic material which will, when heated, so temporarily deform itself as to release the filament holder and when cool again return to its initial operative setting. The resilient contact members may be made in the form of a spider having spring fingers at the ends of the arms and expansion of the said arms by the

heat be relied upon to carry the fingers into such a setting as will release the filament holder. Alternatively, the material chosen may be such that when heated it temporarily loses its resilience and thus releases the filament holder. In this connection it should be remembered that the spring which is between the two portions of the filament holder is always tending to disconnect the filament from the contact members, and take the filament holder into the second mentioned of said settings.

Conveniently the housing is tubular with the resilient contact members near one end which is closed and with the other end open and exposed for the insertion and removal of the filament holder. Apertures are preferably cut in the housing adjacent to the situation at which the filament is heated so as to allow undue heat to dissipate and the sides of the housing may further be cut to form spring fingers which assist in retaining the filament holder in the second mentioned of the said settings. That portion of the filament holder which engages the tubular housing may also have spring fingers to take a fairly tight grip on the housing. On its outer end it may be provided with an outturned rim or flange which is intended to abut against the end of the housing and thus determine the second mentioned setting of the filament holder.

It is to be understood that the invention is not restricted to the precise constructional details set forth.

Dated this 20th day of February, 1937.
BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C.1,
Chartered Patent Agents.

COMPLETE SPECIFICATION

Improvements in or relating to Electric Lighters for Cigars and the like

I, COLIN DEFRIES, Lt.-Col., of 69, Drayton Gardens, Fulham Road, London, S.W.10, a British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention is for improvements in or relating to electric lighters for cigars and the like and has for one of its objects to provide a construction which will be simpler and safer to use than are existing constructions, and in which the parts may be accurately and sturdily constructed and yet are capable of mass

production, so that the device will always work as intended and may not easily be tampered with and brought out of adjustment.

The invention is concerned with electric lighters of the type in which the filament, which when electrically heated serves as the igniting means, is mounted in a holder which is detachably received in a housing carrying electrical contacts whereby when the holder is in place in the housing current may be passed through the filament to heat it and after the filament has been sufficiently heated the holder may be withdrawn for use in igniting a cigar or the like.

According to one feature of the present invention, there is provided an electric lighter which is of the type just described and which embodies devices 5 determining two alternative settings for a plug-like filament holder in a tubular housing in one of which settings (the closed circuit setting), which is a deep setting, the filament is electrically con- 10 nected to said contacts and in the other of which settings (the open circuit setting), which is a shallower setting, the filament is not electrically connected to said contacts, and which also embodies 15 means tending to move the filament holder from the closed circuit setting to the open circuit setting, and a device which tends to retain the filament holder in the closed circuit setting (into which 20 it is adapted to be moved manually) but is influenced by the heating of the filament and automatically releases the holder when the filament has been heated to a predetermined temperature, which 25 lighter is characterised in that the said retaining device serves to carry current to the filament in the closed circuit setting. Conveniently the retaining device aforesaid comprises a plurality of 30 bimetallic fingers which engage and grip a ferrule on the filament holder and which are deformed to release the ferrule when heated to a predetermined temperature and which fingers and 35 ferrule constitute separable contacts for conducting current to the filament.

In a convenient construction according to the invention the filament holder is inserted in and removed from the 40 housing in the direction of the length of the holder, and is formed in two main portions which within limits are slidable the one relatively to the other length- wise of the holder, of which main 45 portions one carries the filament and the other engages the housing in such manner as to determine the said open circuit setting, and which two portions have between them a spring which 50 resists movement of the filament-carrying portion of the holder from the open circuit setting towards the closed circuit setting and tends to return it from the latter towards the former.

The construction and arrangement of the electrical contacts are important and constitute features of the present inven- 55 tion. This construction consists of the combination, in an electric lighter of the type described in the second paragraph of this complete Specification, of a 60 housing, a filament holder mounted in said housing for complete removal and replacement, a heating element on the 65 inner end of said holder and including a

resistance wire or filament and an annular contact or ferrule connected thereto and closely thermally encircling said filament, a contact finger in the 70 housing to engage directly the annular contact or ferrule on the heating element and be heated thereby, and means completing an energising circuit through said filament, said contact finger 75 being heat-responsive so as to disengage electrically said annular contact or ferrule when the said filament is brought to a desired degree of incandescence.

For a more complete understanding of these and other features of the invention 80 there will now be described, by way of example only and with reference to the accompanying drawings, one constructional form of cigar lighter according to the present invention. It is to be under- 85 stood, however, that the invention is not restricted to the precise constructional details set forth.

In these drawings:—

Figure 1 is an elevation of a cigar 90 lighter according to the present invention showing the same mounted on a plate.

Figure 2 is a longitudinal section of the device, on a scale larger than that of 95 Figure 1, showing the filament holder in open-circuit setting.

Figure 3 is a view similar to Figure 2, but showing the filament holder and part of the housing in elevation with the 100 filament holder in closed-circuit setting.

Figure 4 is a disassembled perspective view of the contact means on the housing including the bimetallic heat-responsive 105 contacts.

Figure 5 is a perspective view of a spring retaining ring employed on the filament holder, and

Figure 6 is an elevation of the filament holder by itself, on the same scale as that 110 of Figure 1.

Like reference numerals indicate like parts throughout the drawings.

As shown in the accompanying draw- 115 ings, the cigar lighter of the present invention comprises a housing 10, in the form of a tube, having at its front end a turned-out flange 11 adapted to engage the surface of a panel or instrument board or the like 12 when the housing is 120 inserted through a hole 13 in the panel.

The filament holder is in the form of a plug 14, shown in Figure 6, usually cylindrical in form, and adapted to fit slidably in the tubular housing 10 which 125 takes the form of a well.

The filament holder 14 has on its end a filament or heating element 15 compris- 130 ing a coil or filament of resistance wire 16, see Figure 2, enclosed by an annular

metallic ferrule 17 and mounted on a metal body 18 screw-threaded, or otherwise secured, in a body of insulation 19. The ferrule 17 constitutes an electrical contact, and it is connected to the filament 16 and closely thermally encircles it. A portion of the body 19 is of such diameter as to engage slidably the internal wall of the housing 10, but another portion of it is reduced, and in this portion there is a sleeve 20 which has at one end a flange 21 to engage the flange 11 on the housing and at the other end a flange 22 normally engaging a shoulder on the insulating body 19.

A space is provided between the sleeve 20 and the reduced portion of the insulating body 19, and in this space there is provided a spring 23, one end of which, through a washer 24, engages the flange 22 on the sleeve. The other end of the spring engages a ring 25, shown in perspective in Figure 5, and this has a single thread 26 adapted to be screwed on the threaded end 27 of the insulating body 19 to retain the spring within the space between the sleeve and the insulating body. The threaded end 27 of the insulating body also has, in threaded engagement therewith, a handle 28 which engages and backs up the ring 25.

Thus it will be seen that the filament holder is in two main portions, one of which carries the filament 15, and the other of which (the sleeve 20 with its flange 21) makes endwise engagement with the housing 10, and that these two main portions are longitudinally movable the one relatively to the other so that the portion carrying the filament may occupy either of two settings in the housing 10.

In the normal setting of the filament holder in the housing (which is the open circuit setting) the flange 21 on the sleeve 20 engages the flange 11, as shown in Figure 2. When, however, it is desired to move the filament holder deeper in the socket of the housing to the other of its settings, which is the closed circuit or energising setting, manual pressure on the handle 28 causes the end of the spring engaged by the ring 25 to be moved to the left, as viewed in Figure 2, while the sleeve 20 is held against movement by the engagement of the flange 21 thereof with the flange 11 of the housing. This causes the spring 23 to be compressed so that it tends normally to return the filament holder to the open circuit setting shown in Figure 2.

The sleeve 20 is provided with tongues 120 preferably formed by cutting or lancing the material thereof, and these tongues are bent outwardly so that friction is produced between the sleeve

and the housing to retain the filament holder in the housing against casual or accidental removal even when the filament holder is in normal or open-circuit setting. It will be readily understood that the ring 25 may be dispensed with, in which case the end of the handle 28 will directly engage the spring. However, the ring 25 acts as a retainer for the spring, so that, even if the handle should be removed, the spring will not jump out of place. Frequently, it is desirable to remove one handle and substitute another of a different style or construction.

The outer convolution of the resistance coil 16 is, according to the present invention, secured to the ferrule 17 in electrical contact therewith, preferably by welding. The inner end of the coil is electrically secured to a pin 29 passing through the metal body 18 and riveted over so as to hold the coil, ferrule and insulating discs 30 as a single entity or unit.

It will thus be seen that current may be conducted to the heating coil by the ferrule 17 and a flange portion 31 on the metal body 18, and these portions constitute the contacts on the filament holder which are engaged by one or more suitable contacts on the housing to conduct current to the heating coil. The co-operating contacts on the housing have merely a sliding connection with the contacts 17 and 31, and hence, when the filament is incandescent and ready for use, the entire filament holder may be physically and electrically separated and removed from the housing for the application of the incandescent resistance wire 16 to the end of a cigar or cigarette, or to the tobacco in a pipe.

The housing preferably is connected to one side of the source of current. In case the panel 12 is metallic and is earthed on the chassis of a vehicle, the contact of the flange 11 therewith is sufficient to conduct current to the tubular member constituting the housing. In case the panel 12 is not metallic or is not connected to the battery through an earth, any other suitable connection to the housing may be employed. Since the housing is electrically energised, the flange 31 at all times may engage it. However, it is preferable that special provision be made to ensure a good electrical contact between the flange 31 and the housing, and for this purpose the housing has formed thereon, by cutting or lancing, tongues 32 having bent-down portions in position to be engaged by the flange 31 when the filament holder is in deep energising setting, shown in Figure 3.

The other side of the circuit is connected to the filament when the filament

friction is produced between the sleeve

holder is in energising setting by contact fingers or springs 33, of which (in the construction illustrated) there are three, shown best in Figure 4, and which are preferably formed integral with a disc portion 34. These are mounted on an insulating body 35, preferably of the material sold under the Registered Trade Mark "Bakelite", fitting in the bottom of the well-like housing 10. The fingers 33 are resilient, and are preferably made of bimetallic material. They have their ends bent out into cam formation so as to be forced apart when the ferrule 17 attempts to enter between them, and they have depressed portions 33a adapted to engage over the front portion of the ferrule when the filament holder reaches its energising setting. The resiliency of the fingers 33 is such that they directly engage and grip and retain the ferrule against return movement under the influence of the spring 23 until the filament has been brought to a predetermined temperature and desired degree of incandescence for use. While the filament is being energised, the heat therefrom is conducted to the fingers 33 through the ferrule, and these, being responsive to heat, begin to change their form and continue to do so, moving away from the ferrule until a point is reached at which the filament has been brought to the desired degree of incandescence and the ejecting spring 23 may overcome the friction between the fingers 33 and the ferrule, at which time the spring 23 ejects the filament holder to the Figure 2 setting in which the circuit through the fingers and ferrule is open.

During this ejecting movement, there is a slight noise or click which, as has been previously proposed, apprises the user that the filament is ready for use. Besides this, the support for the resistance wire 16 is apertured and so are the metal body 18, the insulating body 19 and the handle, permitting light from the filament to pass to the end of the handle where it impinges upon a lens 36 causing the latter to glow, as has also been previously proposed.

On occasion, especially when several people desire to light smokers' articles, the filament may cool off in use so that succeeding users may not be able to use it without reheating. When it is desired to reheat the filament, it may be found that the heat-responsive fingers 33 have not yet returned to circuit-engaging position because of the heat retained by the housing in its rather protected position against draughts of cool air.

In the construction according to the present invention, however, the circuit

may still be closed by manually holding the filament holder in the closed circuit setting when it is desired to reheat the filament under such conditions because other contacts are provided to feed current to the filament even though the heat-responsive contact members are in open circuit position. For this purpose, and to act as a definite inner stop for the filament holder, the housing has a plurality of combined stop and contact fingers 37, preferably three in number, and interspersed between the contact fingers 33.

Any suitable form of mounting means for the contacts 33 may be employed. However, it is found very convenient and satisfactory to mount the contacts as shown in the accompanying drawings, so that they are supported and spaced by the insulating block 35. This insulating block has recess 38 for the disc 34 of the contact fingers, recesses 39 for the contact fingers 33, and recesses 40 for the contact fingers 37. A central stud 41 holds all these parts together, the stud having a head 42 overlying the base or disc portion 43 of the contact fingers 37 and underlying the disc 34 of the contact fingers 33. The end 44 of the stud extends through a hole in the disc 34 and is spun or riveted over to unite the contact fingers 33 permanently thereto. As thus assembled, the stud 41 the contact fingers 37, and the contact fingers 33 are located through and on the insulating body 35.

The stud 41 with an insulating sleeve 45 and washer 46 which surround it, extend rearwardly through a threaded sleeve 47 secured to the bottom wall 48 of the housing and a reinforcing member 49 therefor. The stud 41 has an end portion extending beyond the sleeve 47, receiving nut 50 and a washer 51 to insulate the nut 50 from the sleeve 47. When the nut 50 is tightened up, the contact assembly is held in the bottom of the housing. The other end of the stud 41 is adapted to receive a coupling device 52 to which the end 53 of a circuit supply wire may be soldered or otherwise electrically connected. The coupling 52 and nut 50 may be covered against accidental contact by a rubber sleeve 54.

In the form of the invention shown, the housing is secured to the panel 12 by a tubular clamping device or shell 55 having a neck 56 threaded to be received on the threaded sleeve 47 while the forward end 57 of the tubular clamping device engages the inside surface of the panel 12. The tubular clamping device is stiffened by longitudinal ribs 58 and completely encloses the housing except

for apertures 59 providing suitable ventilation.

5 The tubular clamping device is put in place simply by screwing it on the housing by hand, and thus any damage done by the use of tools is avoided. The tubular housing protects the contacts 33 against being intentionally bent out of

and which fingers and ferrule constitute separable contacts for conducting current to the filament.

3. An electric lighter according to Claim 1 or Claim 2, in which the filament holder is inserted in and removed from the housing in the direction of the length of the holder, and is formed in two main 70

ment, and wherein said auxiliary contact and the bimetallic fingers are positioned against relative movement by a block of insulating material.

- 5 10. In an electric lighter of the type described, the combination of a housing, a filament holder mounted in said housing for complete removal and replacement, a heating element on the inner end
10 of said holder and including a resistance wire or filament and an annular contact or ferrule connected thereto and closely thermally encircling said filament, a contact finger in the housing to engage
15 directly the annular contact or ferrule on the heating element and be heated

thereby, and means completing an energising circuit through said filament, said contact finger being heat-responsive so as to disengage electrically
20 said annular contact or ferrule when the said filament is brought to a desired degree of incandescence.

11. The electric lighter of the type described substantially as shown in the
25 accompanying drawings.

Dated this 17th day of June, 1937.

BOULT, WADE & TENNANT,
111 & 112, Hatton Garden, London,
E.C.1,
Chartered Patent Agents.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 5.

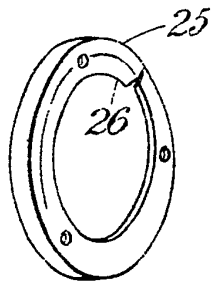


Fig. 2.

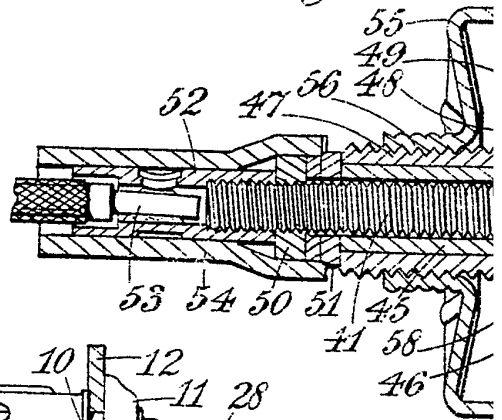


Fig. 1.

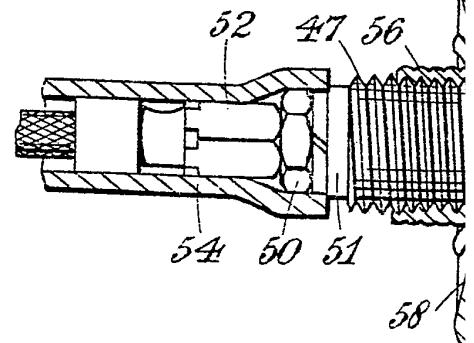
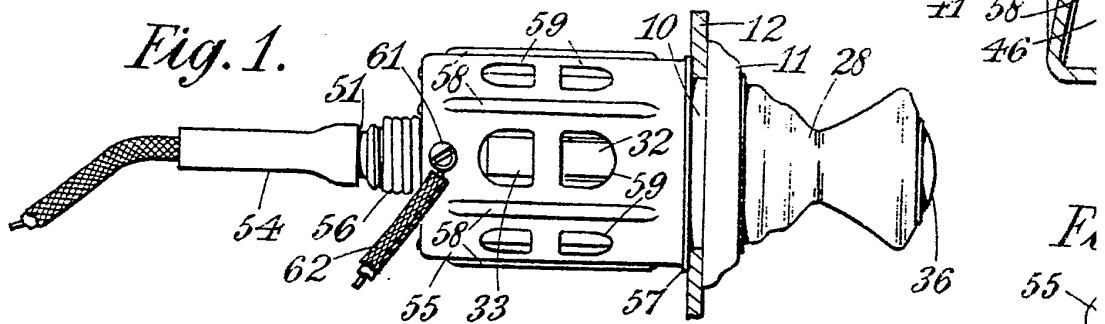
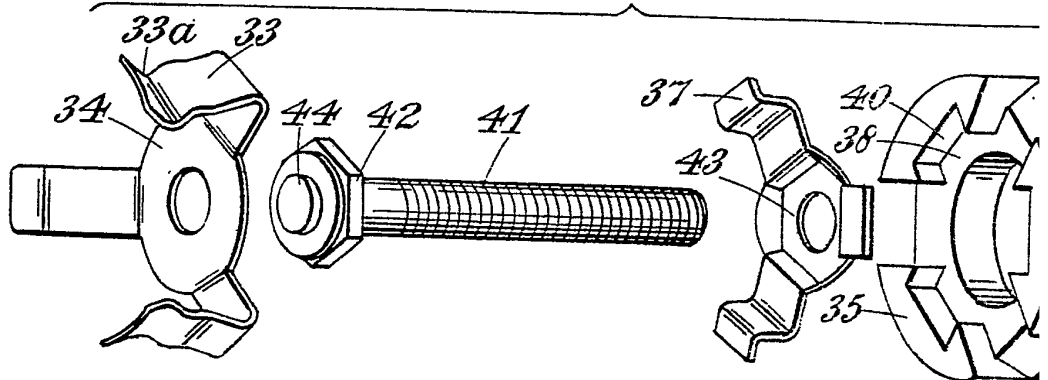
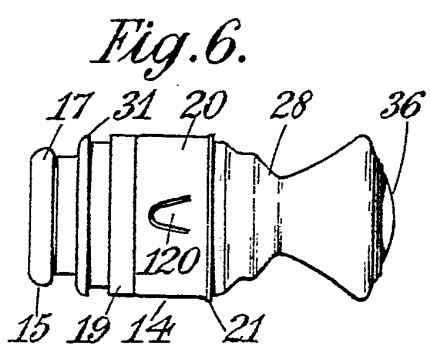
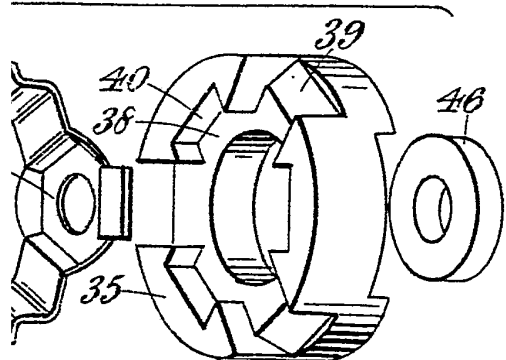
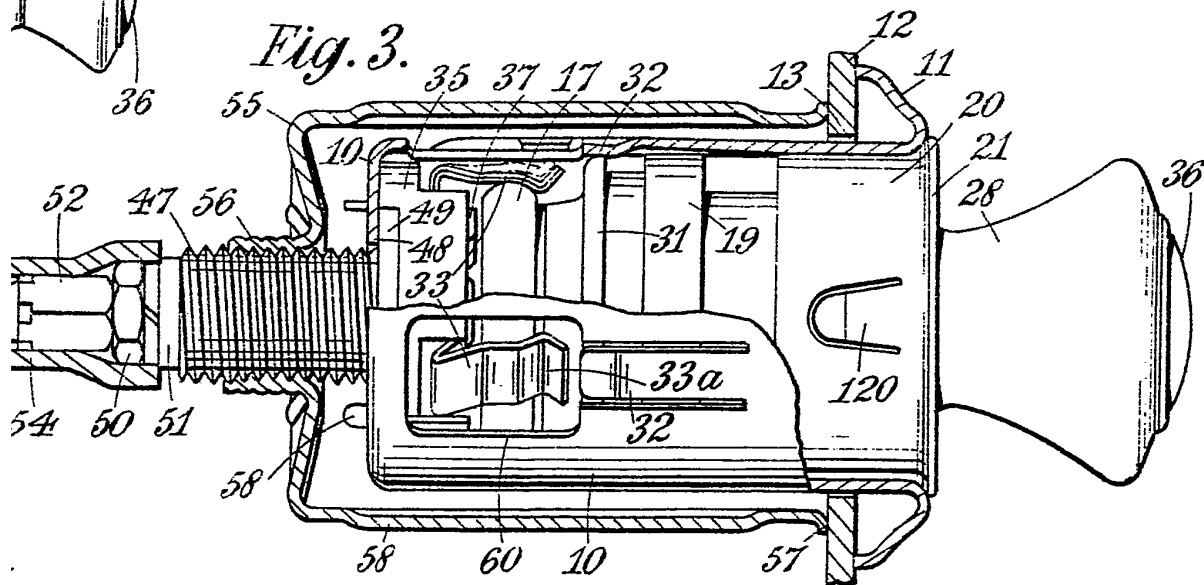
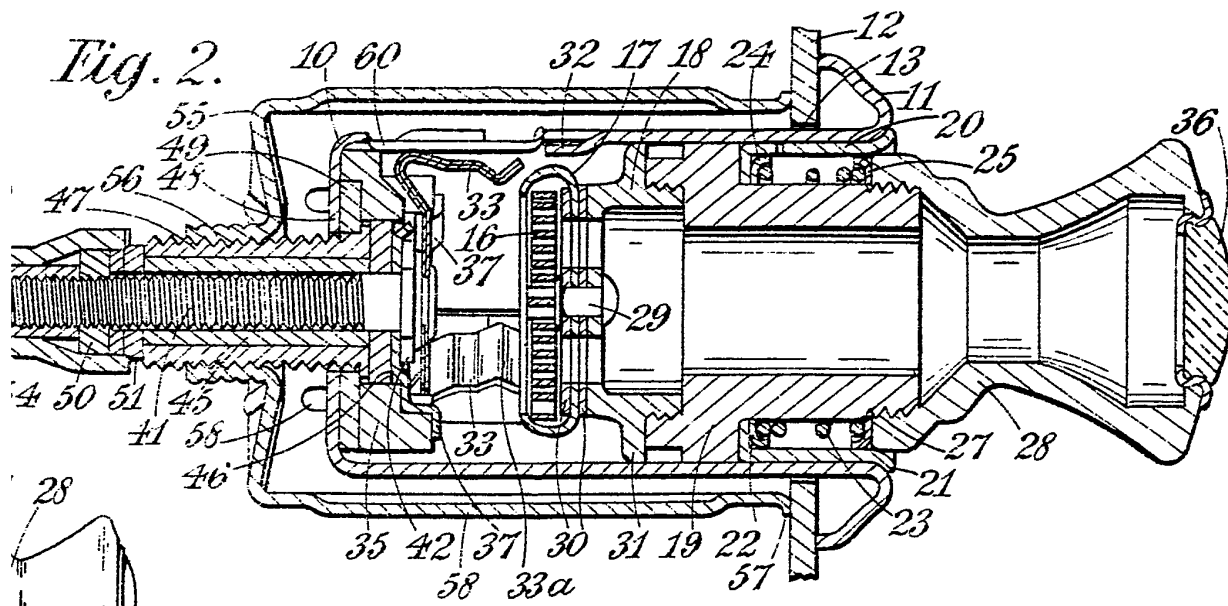
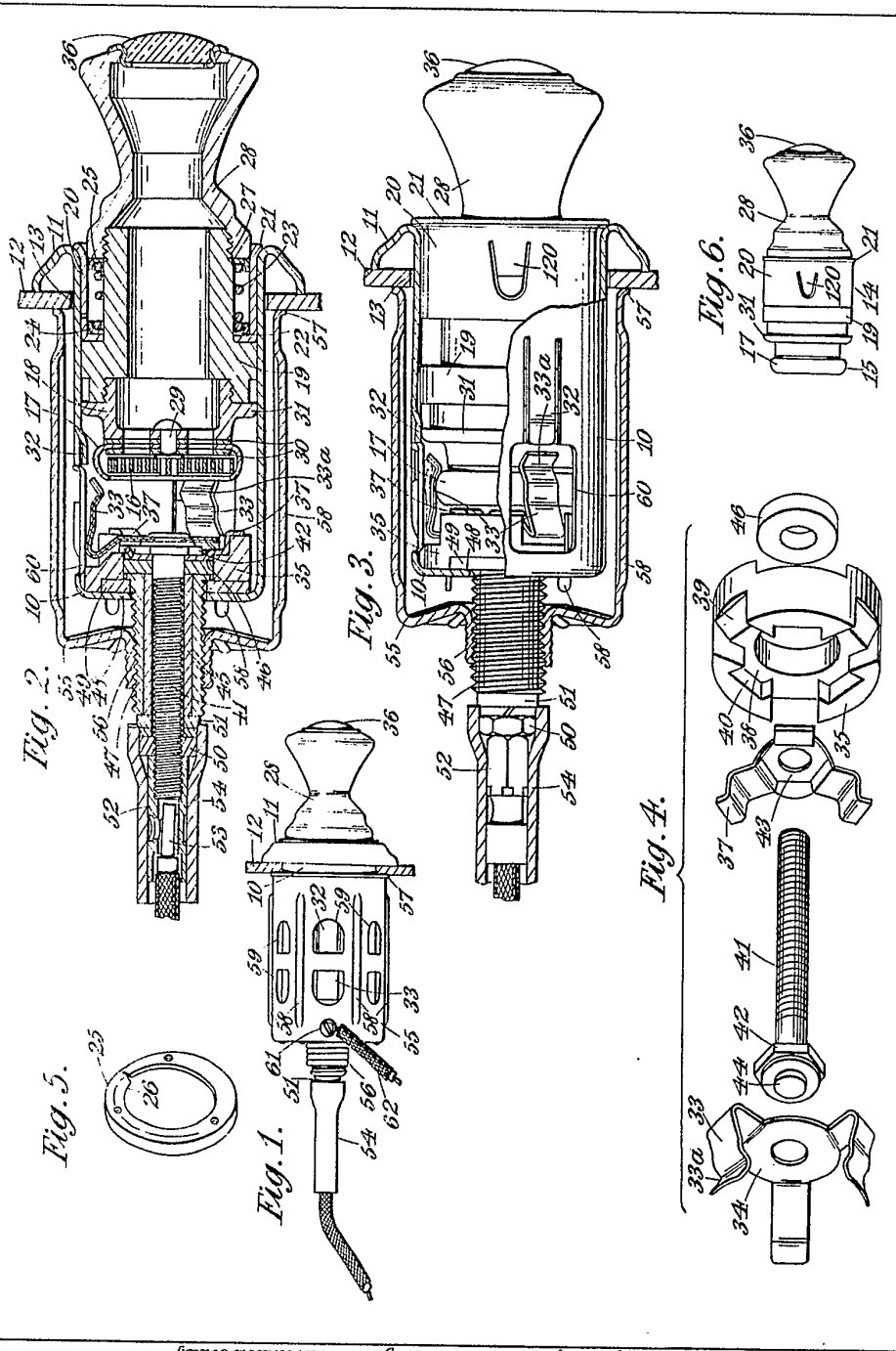


Fig. 4.







[This Drawing is a reproduction of the Original on a reduced scale.]