

May 26, 1953

W. F. WAGNER

2,639,597

LIGHTER

Filed Dec. 23, 1949

2 Sheets-Sheet 1

FIG. 1

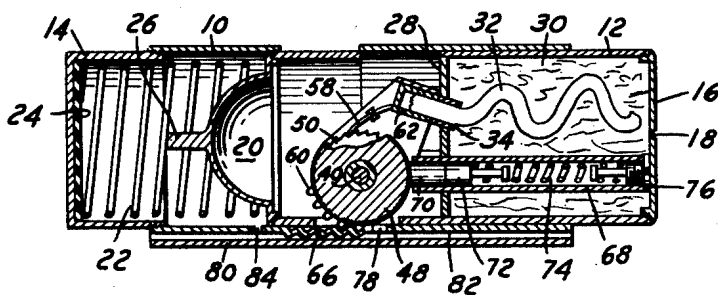


FIG. 2

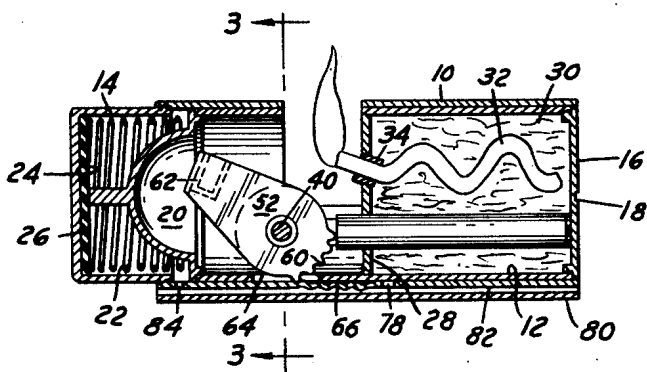


FIG. 3

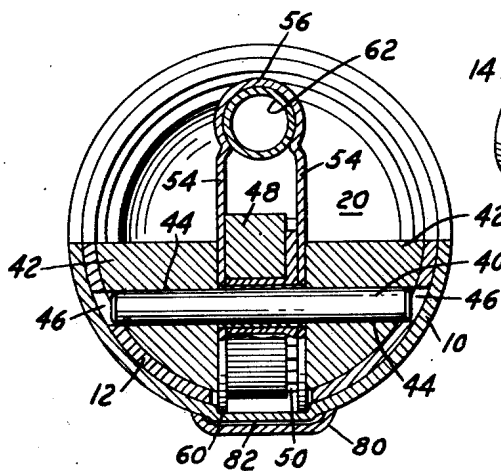
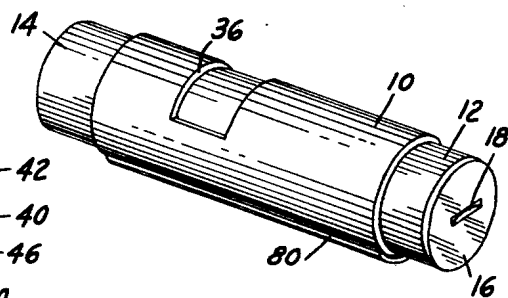


FIG. 4



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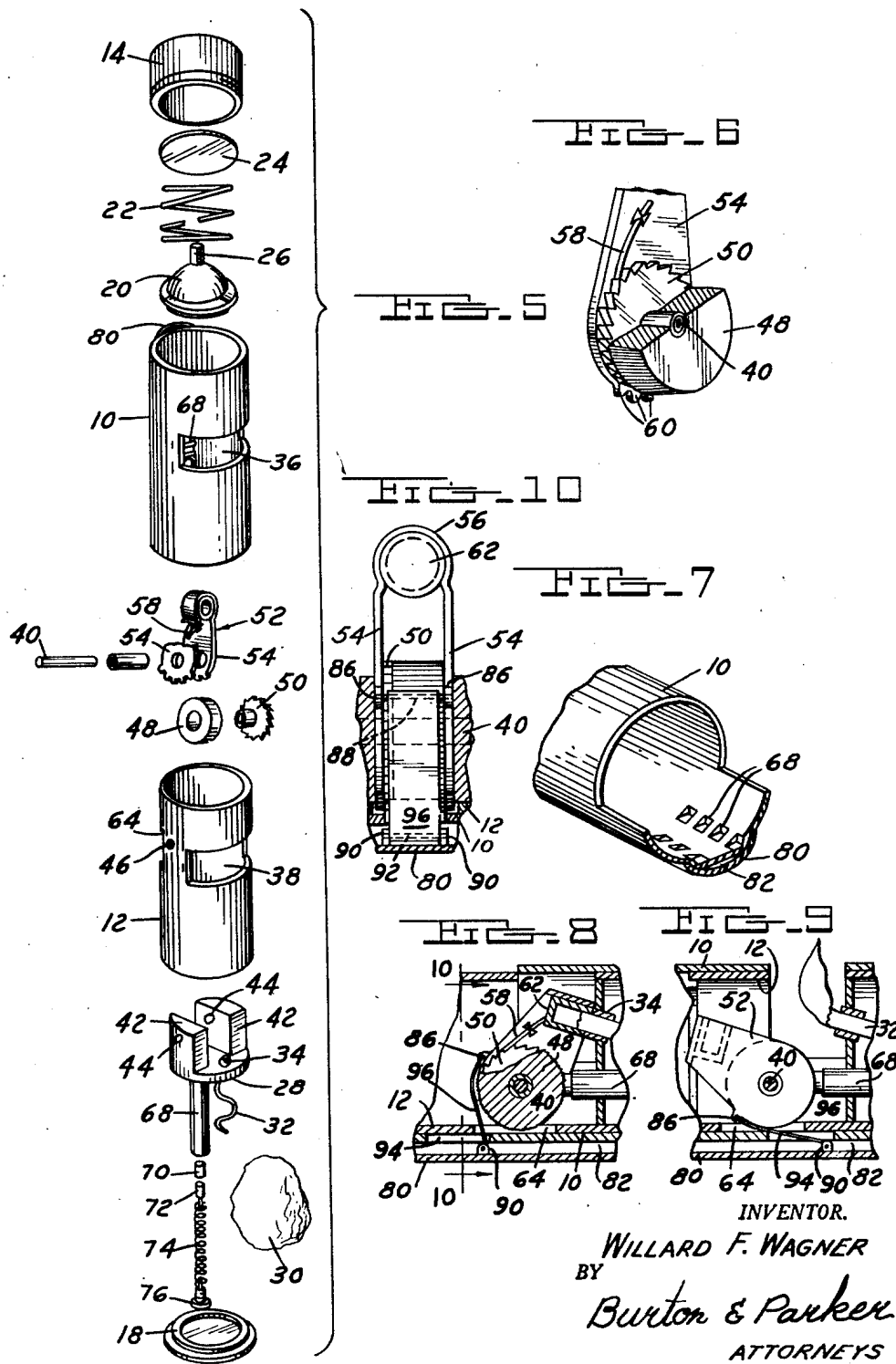
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# UNITED STATES PATENT OFFICE

2,639,597

LIGHTER

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3 Claims. (Cl. 67-7.1)

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This invention relates to a lighter primarily adapted for cigars and cigarettes and particularly to an improved lighter having inner and outer casing sections arranged for telescopic movement relative to one another.

The invention is particularly adapted for cigar and cigarette lighters of the character having two sliding telescoping casing sections arranged to provide a flame chamber which is opened when the sections are telescoped in one direction and closes the chamber when the sections are telescoped in the opposite direction. The features of the invention, although particularly adapted for the telescoping type of lighter hereinabove mentioned, are also applicable to other types of lighters.

An important feature of the invention, particularly as it applies to lighters having telescoping casing sections, is the provision of the flame producing mechanism which is responsive to the movement of the casing sections in the chamber opening direction to produce an igniting spark and which is so structurally related to the casing sections that when the lighter moves in the opposite direction the mechanism serves in a novel manner to limit the movement of the sections in chamber closing direction. The sparking mechanism is carried by one of the telescoping sections and comprises a pivoted assembly including a rotatable friction wheel and novel means operatively coupled to the telescoping sections for effecting swinging movement of the assembly and rotation of the friction wheel when the two casing sections move relatively with respect to one another.

Another important feature of the invention is the provision of means for circulating air into and out of the flame chamber during the time it is closed so as to reduce the moisture content thereof. Associated with the means for providing such circulation is a novel guard or shield member on the outer casing section which provides a passage opening adjacent at least one of the ends of the device and communicating with the interior of the lighter. Novel means is provided which is responsive to the telescopic action of the casing sections to induce air to travel through the passage and assure circulation of fresh air into the interior of the device.

The parts of the device are relatively simple in construction and are adapted for economical manufacture and rapid assembly. An important feature of the invention is the arrangement and location of these parts such that the device may be readily assembled at minimum labor and dis-

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assembled, if desired, for repair and replacement of parts.

Various other objects, advantages and meritorious features of the invention will become more fully apparent from the following specification, appended claims and accompanying drawings, wherein:

Fig. 1 is a longitudinal sectional view through a lighter embodying the invention and showing the parts in the position they assume when the casing sections are telescopically extended,

Fig. 2 is a longitudinal sectional view similar to Fig. 1, but showing the position of the parts when the casing sections are telescopically contracted,

Fig. 3 is a cross sectional view of the lighter taken along the line 3-3 of Fig. 2,

Fig. 4 is a perspective view of the device in its normally closed condition,

Fig. 5 is an exploded view showing the parts in perspective and in substantially the order of their assembly,

Fig. 6 is a detailed fragmentary perspective view of a part of the pivotal spark producing assembly,

Fig. 7 is a fragmentary perspective view of a portion of the outer casing section showing the manner of forming rack teeth therein,

Fig. 8 is a fragmentary longitudinal sectional view through a similar lighter illustrating a modified mechanism for actuating the sparking device and showing the position assumed by the parts in chamber closed position,

Fig. 9 is a view similar to Fig. 8, but illustrating the position of the parts in chamber opened position, and

Fig. 10 is an enlarged sectional view taken along line 10-10 of Fig. 8.

An illustrated embodiment of the invention is shown in the drawings having the body or shell thereof composed of two telescoping casing members or sections capable of contractible and extensible movement between two extreme positions. In one position a chamber is opened from which issues a flame for lighting purpose. In the other position the flame chamber is substantially closed and all operating parts of the device are protectively enclosed within the two casing sections. However, even in the closed position of the parts, provision is made for circulating air into and out of the flame chamber in order to reduce the moisture content thereof and secure better performance of the flame producing parts. The lighter of the present invention is also so designed that certain moving parts

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thereof serve to hold the two telescoping sections from complete separation thereby eliminating the necessity of providing a special stop for the purpose.

Referring particularly to the drawings, the outer casing section or member is indicated at 10 and the inner casing section or member at 12. The two casing members telescopically fit one another and as shown are of cylindrical formation. However, it is understood that they may be of elliptical or of other non-circular cross sectional formation if desired. One end of the outer casing section 10 is closed by a screw threaded cap 14. The opposite end of the outer section 10 is open, and in any extended position of the parts one end of the inner section 12 projects therefrom as shown in Fig. 1. This last end of the inner section 12 is normally closed by a removable disc-shaped cover plate 16 having an external key or coin receiving notch 18 to facilitate turning thereof. The opposite or inner end of the casing section 12 is closed by a cap 20, the central expanse of which is convexly curved or dome-shaped as shown for the purpose of providing clearance for a moving part of the device. The flat peripheral margin of the cap 20 is shaped for interfitting engagement with the inner end of the casing section 12 as shown in Figs. 1 and 2.

The left end of the device as viewed in Figs. 1 and 2 between the two caps 14 and 20 forms a substantially closed chamber in which is disposed a coiled spring 22. The coiled spring is seated at its inner end on the peripheral margin of the cap 20 and at its opposite end upon a resilient pad 24 of rubber or the like which lies flat against the outer end wall of the cap 14. The spring is under compression and exerts a force on the two casing sections tending to move them to the extended position shown in Fig. 1. In Fig. 2 the parts are shown in contracted but flame emitting position in which the spring 22 is in a compressed state. The pad 24 cooperates with a projection 26 on the dome portion of the cap 20 to limit the contractible movement of the parts and to lessen the shock of engagement as the two telescoping sections reach this limit of movement.

The inner casing member 12 is divided interiorly into two separate chambers by a wall 28 which is located approximately midway between the opposite ends thereof. This dividing wall cooperates with the cover plate 16 to form a chamber for containing the customary fuel saturated material 30, such as cotton, and the major portion of the wick 32. The dividing wall 28 cooperates with the dome-shaped cap 20 in the opposite end of the device to form a flame producing and emitting chamber. The wick 32 extends through the wall 28 and into the flame chamber. It is supported as it passes through the wall by means of a short sleeve portion or collar 34, the axis of which is inclined as shown at an acute angle to the longitudinal median line of the device for a purpose hereinafter described.

The two casing members 10 and 12 are each cut away or otherwise shaped to form side wall openings or apertures which in one extreme position of the telescoping movement of the members are in registration with one another and in the other extreme position of the movement of the members are staggered with respect to one another and therefore completely out of registration. The aperture in the side of the outer casing member 10 is indicated at 36 and as shown in Figs. 4 and 5 the aperture has a greater peripheral dimension than its axial dimension. The

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aperture in the side of the inner member 12 is indicated at 38 and corresponds in size to the aperture 36 of the outer member. In the embodiment of the invention illustrated herein the two apertures are in the form of semi-circular slots adapted to completely register in the fully contracted position of the casing members as shown in Fig. 2 and to be completely out of registration in the fully extended position of the members as shown in Fig. 1. The aperture 38 of the inner member 12 is located adjacent to the dividing wall 28 but on the flame chamber side thereof. The aperture 36 for the outer member is located closer to the end cap 14 of the body than to the opposite end, and the arrangement is such that in the fully contracted position of the parts, and in positions approaching that condition, the two apertures 36 and 38 open the flame chamber to the outside.

Located in the flame chamber is a movable assembly for igniting the wick 32. The assembly is pivoted on a cross shaft or pin 40 for swinging movement. The pin is supported by the inner casing member 12 and for this purpose the dividing wall 28 is provided with two correspondingly shaped longitudinal projecting portions or journal mountings 42—42 which extend in side by side slightly spaced apart relation. The two portions 42—42 and the wall 28 may form an integral one-piece construction as shown in Fig. 5. The two projecting portions 42—42 of the dividing wall are provided with aligned bores 44—44 in which the ends of the pivot pin 40 are received. Thus mounted, the axis of the pin coincides with a chord line of the inner casing section 12 approximately midway between the center and the periphery thereof as shown in Fig. 3 and bridges the space between the two projecting portions 42—42. The projecting portions 42—42 are curved on their outer surfaces to conform with the inner periphery of the casing section 12 and snugly fit the same. The inner section 12 is provided with a circular aperture 46 on each side thereof which are adapted to align with the projecting portions. In the assembled position of the parts, the ends of the pivot pin 40 lie within the bores 44—44 and partially within the apertures 46—46 of the inner casing section 12 as shown in Fig. 3. The pin is maintained in this position by the complete overlapping of the outer casing section 10 over the apertures 46—46.

The assembly within the flame chamber for igniting the wick is in general composed of conventional elements for this purpose but the elements themselves are constructed and arranged in a distinctly novel manner to gain certain advantages. The assembly comprises a friction wheel 48 journaled on the pivot pin 40 intermediate the projections 42—42, a ratchet wheel 50 fixed to one side of the friction wheel 48 and similarly journaled on the pivot pin 40, and a U-shaped enclosure for the two wheels generally indicated at 52 in Fig. 5 and comprising the spaced side wall portions 54 and a closed end portion 56 remote from the pivot pin 40. The side wall portions 54—54 of the U-shaped member are pivotally mounted on the pin 40 on the opposite sides of the friction wheel 48 and the ratchet wheel 50 and between the same and the projecting portions 42—42 as shown in Fig. 3. A pawl 58 is carried by one of the side walls 54 of the U-shaped member as shown in Figs. 1 and 6. This pawl engages the teeth of the ratchet wheel 50 and limits the rotation thereof and the friction wheel to one direction.

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The extremities of the side wall members 54—54 of the pivotal assembly 52 are shaped with an arcuate set of teeth 60 which project beyond the friction wheel as shown in Figs. 3 and 6 and form segmental portions of a pinion. The closed end 56 of the U-shaped member receives a flame extinguisher or snuffer 62 of cup-shaped formation which is arranged as shown in Fig. 1 to abut the collar 34 through which the wick 32 projects. The closed end of the U-shaped member may be crimped around the snuffer as shown in Fig. 3 to secure the same permanently in place against lateral displacement. The snuffer 62 and the collar 34 are arranged such that in one position of the swinging movement of the former it abuts the end of the collar which projects into the flame chamber. This abutment not only serves to form a subsidiary chamber in the device completely sealing the igniting end of the wick but also as a stop limiting further swinging movement of the snuffer 62.

The inner casing section 12 is provided with a slightly longitudinally elongated slot 64 on the side thereof opposite to the aperture 38 and in juxtaposition to the teeth 60 of the U-shaped member. The extremities of the U-shaped member are arranged to project a distance such that the teeth thereof during the swinging movement of the assembly are carried into the slot 64 and beyond the outer peripheral surface of the casing section 12. Cooperating with these teeth and forming a part of the exterior casing section 10 is a rack. The rack is shown in Figs. 1 to 7 inclusive as formed into the side wall portion of the outer casing section 10 at 66 in such a position that it will move across the slot 64 and into engagement with the teeth 60 of the pivotal assembly. Thus, contractible movement of the two casing sections 10 and 12 as shown by a comparison of Figs. 1 and 2 will cause the rack 66 to slide past the slot 64 and successively engage the teeth 60 and swing the assembly in a counter-clockwise direction. This moves the snuffer 62 away from the projecting end of the wick 32 and exposes the latter thereagainst in the flame chamber.

Carried by the device are generally conventional elements for producing sparks for igniting the wick. For this purpose, there is provided a tube 63 extending through the cotton containing chamber from one end to the other end thereof and carrying in projecting relationship to its inner end a flint 70. The latter bears against the friction wheel 48 and, as in conventional practice, rotation of the latter against the stationary flint will produce sparks for igniting the wick. The flint 70 is spring pressed in the usual manner by the provision of a plunger 72 bearing against the base of the flint and a coil spring 74 in the tube 63. The outer end of the tube 58 adjacent to the removable cap 16 is provided with a small closure member 76 threaded thereinto for removing the spring and plunger in order to replace a new flint in the device. The closure member 76 becomes accessible after removal of the cover plate 16.

An important feature of the invention is the provision of means for circulating air into the flame chamber when the latter is closed and the device is in inoperative position such as that illustrated in Figs. 1 and 4. It has been found, particularly in humid weather, that it is difficult to ignite these types of lighters. After the flame has been extinguished and the flame chamber closed, the moisture content thereof is likely to

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deposit on the friction wheel and the flint and impair if not entirely render these elements inoperable. This feature of the invention under consideration enables air to circulate into and out of the closed flame chamber so as to reduce the moisture content thereof. For this purpose there is provided an aperture 78 in the outer casing section 10 which in the closed position of the flame chamber registers with an opening in the inner casing section 12, such as the opening 64, in order to provide circulation of air into and out of the flame chamber. As shown in Fig. 1 wherein the flame chamber is closed the port 78 is in registration with the slot 64 permitting the air to flow into and out of the flame chamber. Of importance is the location of the port 78 immediately adjacent to the peripheral portion of the friction wheel which will strike the flint as shown in Fig. 1. When the device is operated to igniting position such as shown in Fig. 2, the port 78 is shifted to a position staggered with respect to the slot 64.

To conceal the air flowing port 78 in order to prevent it from being accidentally clogged and at the same time providing means for causing a positive flow of air therethrough, the device is provided with an exterior body portion 80 in the form of an elongated slightly channel shaped strip of metal which is integrally connected or otherwise secured to the outside casing section 10. The channel shaped formation of the strip 80 provides an elongated passage 82 running the length thereof and opened at either or both ends thereof. This passage communicates with the port 78 and when the latter is in registration with the slot 64 it also communicates with the interior of the flame chamber when the latter is closed. The channel shaped strip 80 overlies both the port 78 and the rack 66 concealing both of these elements from view.

A small port 84 is provided in the outer casing section 10 which communicates with the chamber in which the coil spring 22 is housed. This port opens into the passage 82 formed by the strip 80 and serves to permit the free flow of air into and out of the spring chamber as the chamber is expanded and contracted without resistance. When the spring chamber is contracted to the position shown in Fig. 2 the air expelled therefrom flows through the port 84 and is discharged into the passage 82. When the device is permitted to return to normal closed position such as shown in Fig. 1, the port 84 permits air to enter the spring chamber. As the parts approach the final closed position shown in Fig. 1 the port 78 registers with the slot 64 and the suction created by the expansion of the spring chamber is communicated by the passage 82 to the port 78. Thus a movement of air is set up in the passage 82 which induces the air in the flame chamber to flow out of the port 78 during the closing movements of the parts.

Figs. 8, 9 and 10 illustrate a modification of the invention wherein, in place of the pinion and rack teeth heretofore described for operating the spark wheel 48, there is provided a connecting element secured directly to the pivoted assembly and to one of the movable casing sections, although shown incorporated in a form of the lighter. This particular form of lighter having telescoping casing sections, is also adaptable to other forms of lighters.

Referring particularly to Figs. 8, 9 and 10, the parts of the lighter corresponding to the same parts described in the preceding embodiment of

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the invention are referred to by the same reference numerals. As shown in Figs. 8 and 9, each side wall 54 of the snuffer carrying member 52 is provided with a small projecting ear 56 located in corresponding positions thereon and serving as a support for a transversely extending pin 88 shown in Fig. 10. A similar set of ears are provided on the inner face of the shield 80, as indicated at 90 in Figs. 8, 9 and 10. This last set of ears are disposed opposite to one another and serve as supports for a pin 92 bridging the space therebetween. The outer casing member 10 is provided with a longitudinal elongated slot 94 which, as shown in Figs. 8 and 9, is adapted to partially overlap the aperture 64 of the inner casing section 12 between the two extreme positions of the parts. Thus overlapping, the two apertures 94 and 64 provide an opening from the interior of the lighter to the inside face of the shield 82 through which extends a connecting element for pivoting the assembly including the spark wheel and the snuffer. This connecting element is in the form of a thin flat slightly flexible metallic band 96 having one end thereof curled about the pin 88 for securement thereto and the opposite end thereof similarly curled about the pin 92 for securement thereto. It is evident that as a result of this construction the connecting band 96 will cause the spark wheel and the assembly associated therewith to swing around the axis of the pin 44 upon contractual telescoping movement of the two casing sections.

In Fig. 8 the casing sections 10 and 12 are in their normally closed position with the operating parts in position corresponding to that shown in Fig. 1. Upon contractual telescoping movement of the two casing sections, the shield 80 moves jointly with the outer casing section 10 and exerts a pull on the connecting band 96 causing the same to rotate the spark wheel and the assembly associated therewith in a counterclockwise direction to the position shown in Fig. 9. In this latter position, the wick 32 is exposed and the flame chamber of the casing sections is opened to permit the flame produced by the wick to rise therefrom. In either position of the parts illustrated in Figs. 8 and 9, the connecting band 96 extends through the overlapping apertures 94 and 64 and by virtue of its flexible and relatively thin flat condition it may be easily accommodated in the confined space between the inner and outer casing sections and the shield 80. The spring 22 will return the parts to the condition shown in Fig. 8 upon release of finger pressure on opposite ends of the lighter and the connecting band 94 will swing the pivoted assembly to its initial starting position shown in Fig. 8.

What I claim is:

1. In a lighter, the combination of inner and outer telescoping casing members forming a flame chamber therebetween, said casing members having relatively large apertures on one side thereof which are in registration with one another to open the flame chamber when the members are at one position of their telescopic movement and which are out of registration with one another to substantially close the chamber when the members are at another position of their telescopic movement, means responsive to the movement of said members in the direction of said aperture registered position to produce a flame in the chamber, said casing members having relatively small ports on the side thereof opposite to said apertures which cooperate in reverse order to the apertures and register with

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one another when the members are in chamber closed position and are out of registration with one another when the members are in chamber opened position, said ports in their registered position providing a flow of air between the substantially closed chamber and the outside of the casing, and an elongated shield carried by the outer casing member and extending along the outside thereof in spaced relation to its outer surface to form an air passage, said shield overlying the port in the outer casing member and providing communication between the port and the passage for the flow of air into and out of the flame chamber when the latter is substantially closed.

2. In a lighter, the combination of an inner casing member and an outer casing member telescopingly slidably fitting together and forming a longitudinal series of three chambers between the opposite ends thereof, said casing members each having a relatively large aperture in a side wall portion thereof which is capable of registering with the aperture of the other member to open the middle chamber when the members are in one position of their telescopic movement and to move out of registration with one another to substantially close the middle chamber when the members are in another position of their telescopic movement, means responsive to the movement of this casing sections to aperture registering position for creating a spark, means carried by one of the remaining chambers for supplying fuel for the middle chamber for ignition by said spark producing means, each casing member having a relatively small port which cooperate with one another in reverse order to their respective apertures and register with one another when the casing members are moved to the position to close the middle chamber and are out of registration with one another when the members are moved to open the middle chamber, said remaining third chamber of the lighter being expansible and contractible in response to the telescopic movement of said casing members, means for providing a communicable air passage between said registering ports and the interior of said third chamber, and means responsive to differential pressures created by the variation in volume of said third chamber for inducing movement of air along said air passage to create a circulation of air for the middle chamber as it is being closed.

3. In a lighter, the combination of inner and outer telescoping casing members forming a flame chamber therebetween, said casing members having relatively large apertures on one side thereof which are in registration with one another to open the flame chamber when the members are at one position of their telescopic movement and which are out of registration with one another to substantially close the chamber when the members are at another position of their telescopic movement, means responsive to the movement of said members in the direction of said aperture registered position to produce a flame in the chamber, said casing members having relatively small ports on the side thereof opposite to said apertures which cooperate in reverse order to the apertures and register with one another when the members are in chamber closed position and are out of registration with one another when the members are in chamber opened position, said ports in their registered position providing a flow of air between the substantially closed chamber and the outside of the

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casing, an elongated shield carried by the outer casing member and extending along the outside thereof in spaced relation to its outer surface to form an air passage, said shield overlying the port in the outer casing member and providing communication between the port and the passage for the flow of air into and out of the flame chamber when the latter is substantially closed, said inner and outer telescoping casing members cooperating to form a second substantially closed chamber capable of varying its volume in response to the telescopic movement of the casing members, said second chamber having a port opening into communication with the air passage formed by said shield, the differential air pressures created by the variation

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in volume of the second chamber causing movement of air in said air passage for changing the air in the flame chamber.

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