



US 20130011800A1

(19) **United States**

(12) **Patent Application Publication**

Chen

(10) **Pub. No.: US 2013/0011800 A1**

(43) **Pub. Date: Jan. 10, 2013**

(54) **FLAME DEVICE INCLUDING A LIFT MECHANISM AND CAN LIFT A FLAME TO A PREDETERMINED HEIGHT**

(52) **U.S. Cl. 431/249; 431/353; 431/344**

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(57) **ABSTRACT**

(21) **Appl. No.: 13/271,305**

(22) **Filed: Oct. 12, 2011**

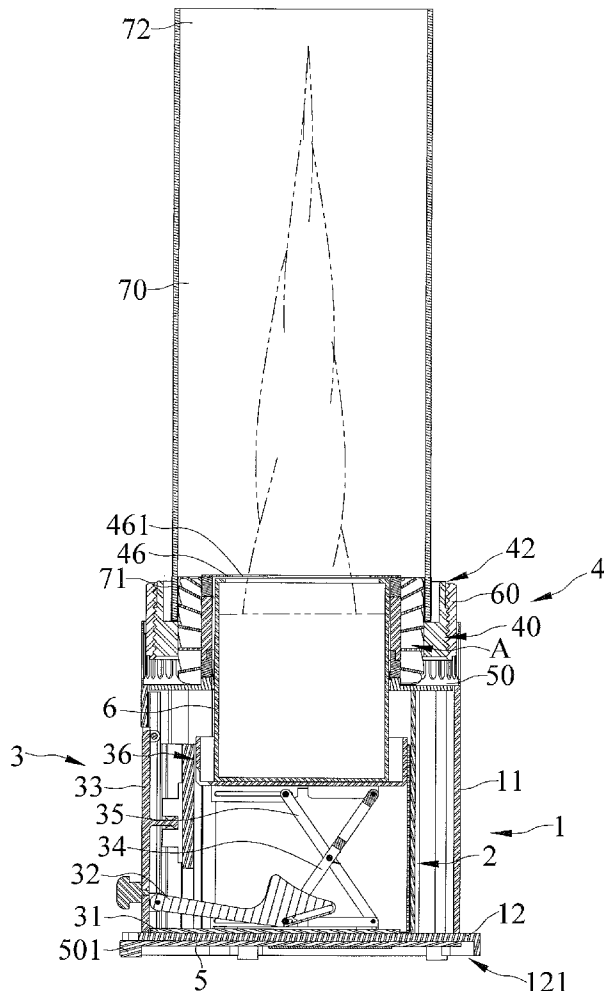
(30) **Foreign Application Priority Data**

Jul. 6, 2011 (TW) 100123861

Publication Classification

(51) **Int. Cl.**
F23C 5/06 (2006.01)
F23C 7/00 (2006.01)
F23D 5/04 (2006.01)

A flame device including a lift mechanism and can lift a flame to a predetermined height includes a base, a cover, and a lift mechanism. The base includes a chamber including an opening. The cover is movably engaged with the base and selectively closes the opening. The lift mechanism includes a supporting member adapted for bearing and lifting a fuel container in the chamber to different heights. The lift mechanism is operably movable in a first direction including the supporting member being moved up from a lower height to the predetermined height and in a second direction including the supporting member being moved down from the predetermined height to the lower height.



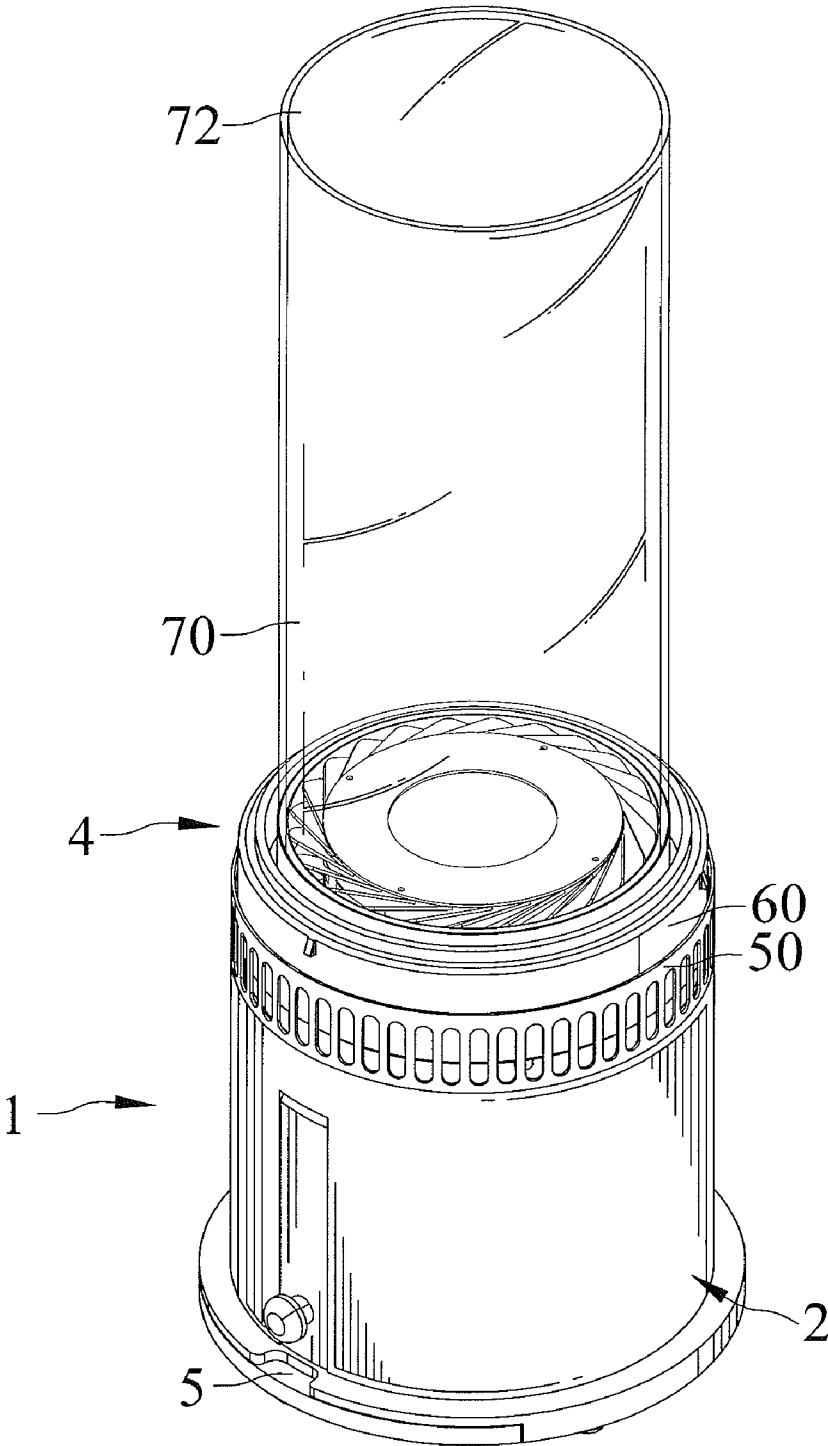


FIG. 1

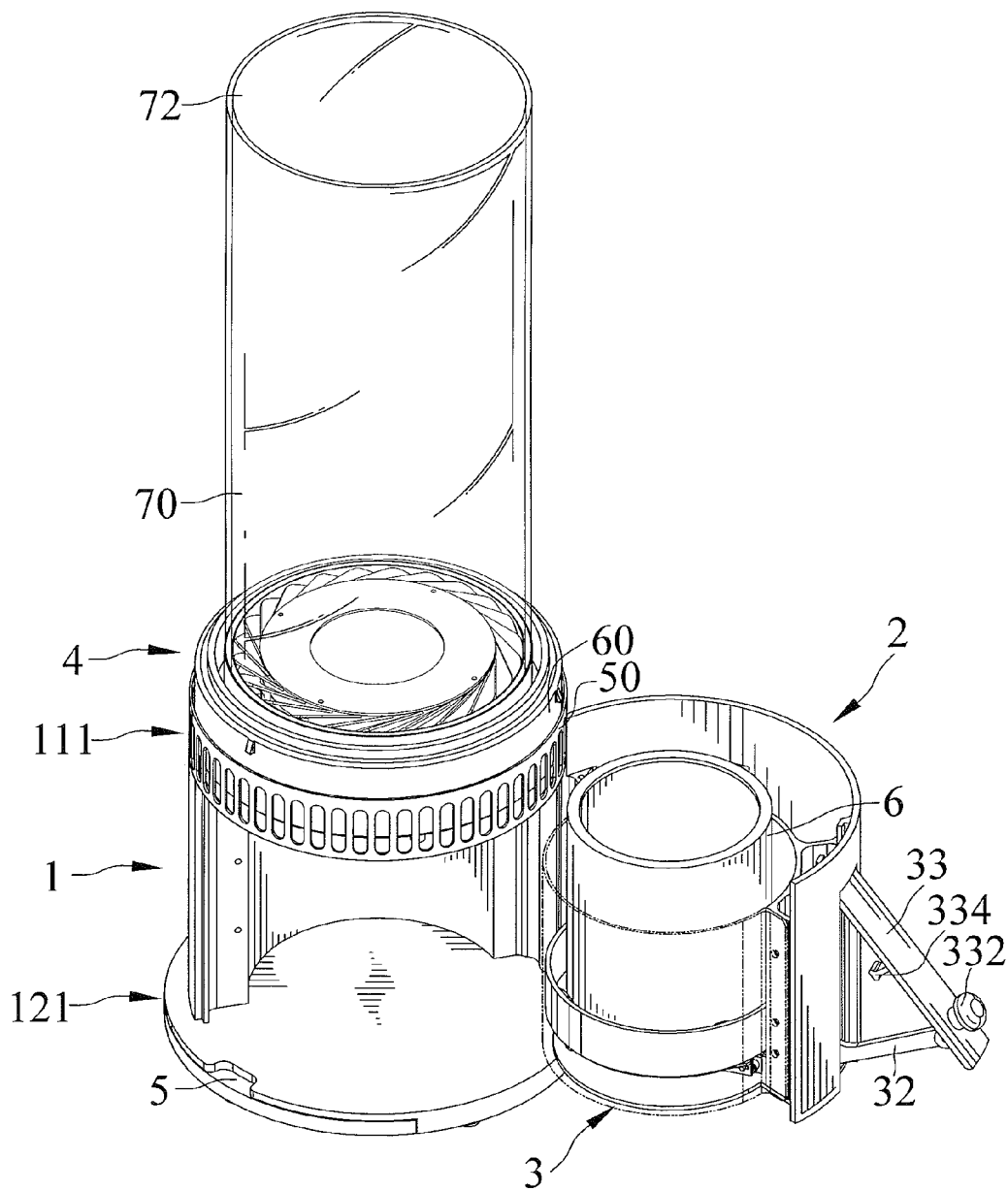


FIG. 2

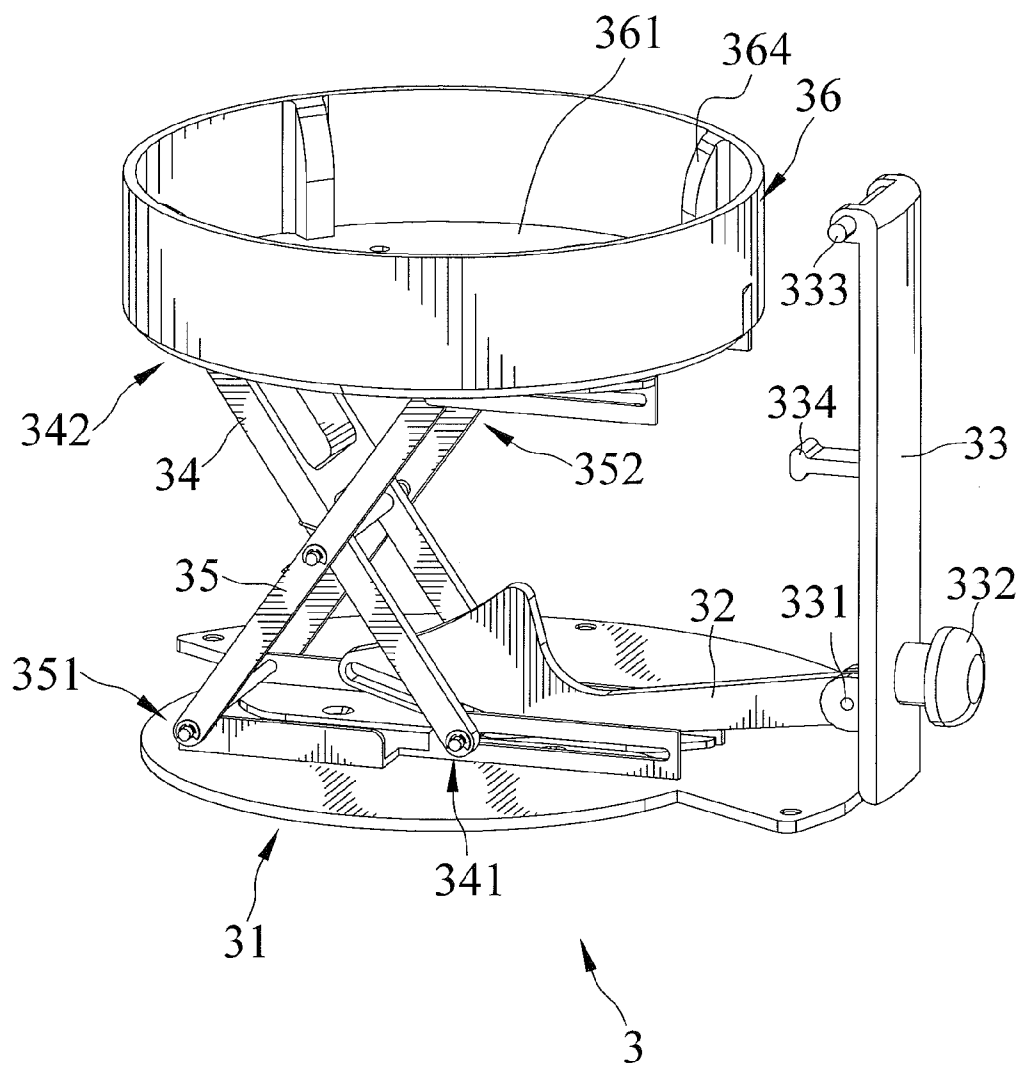
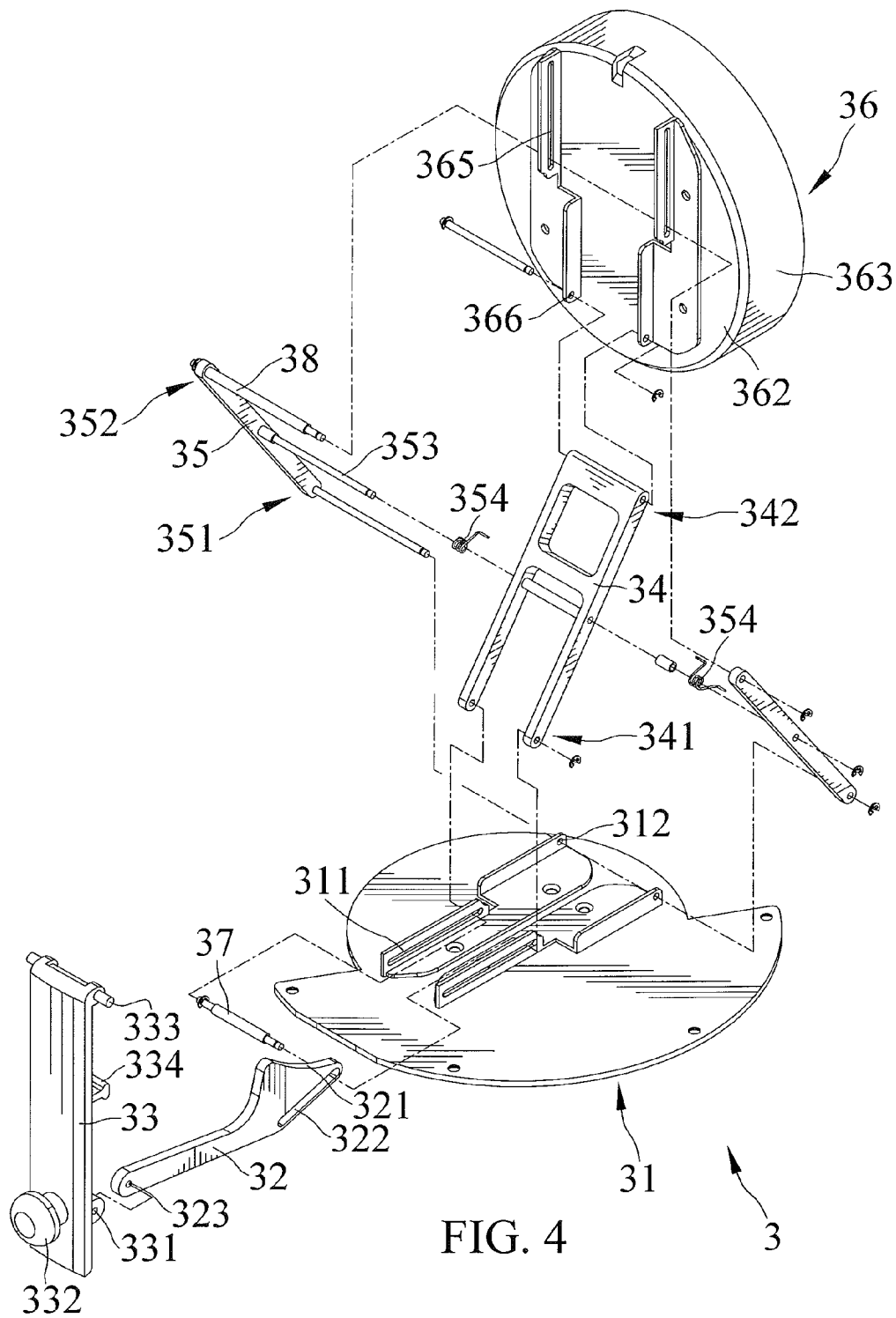
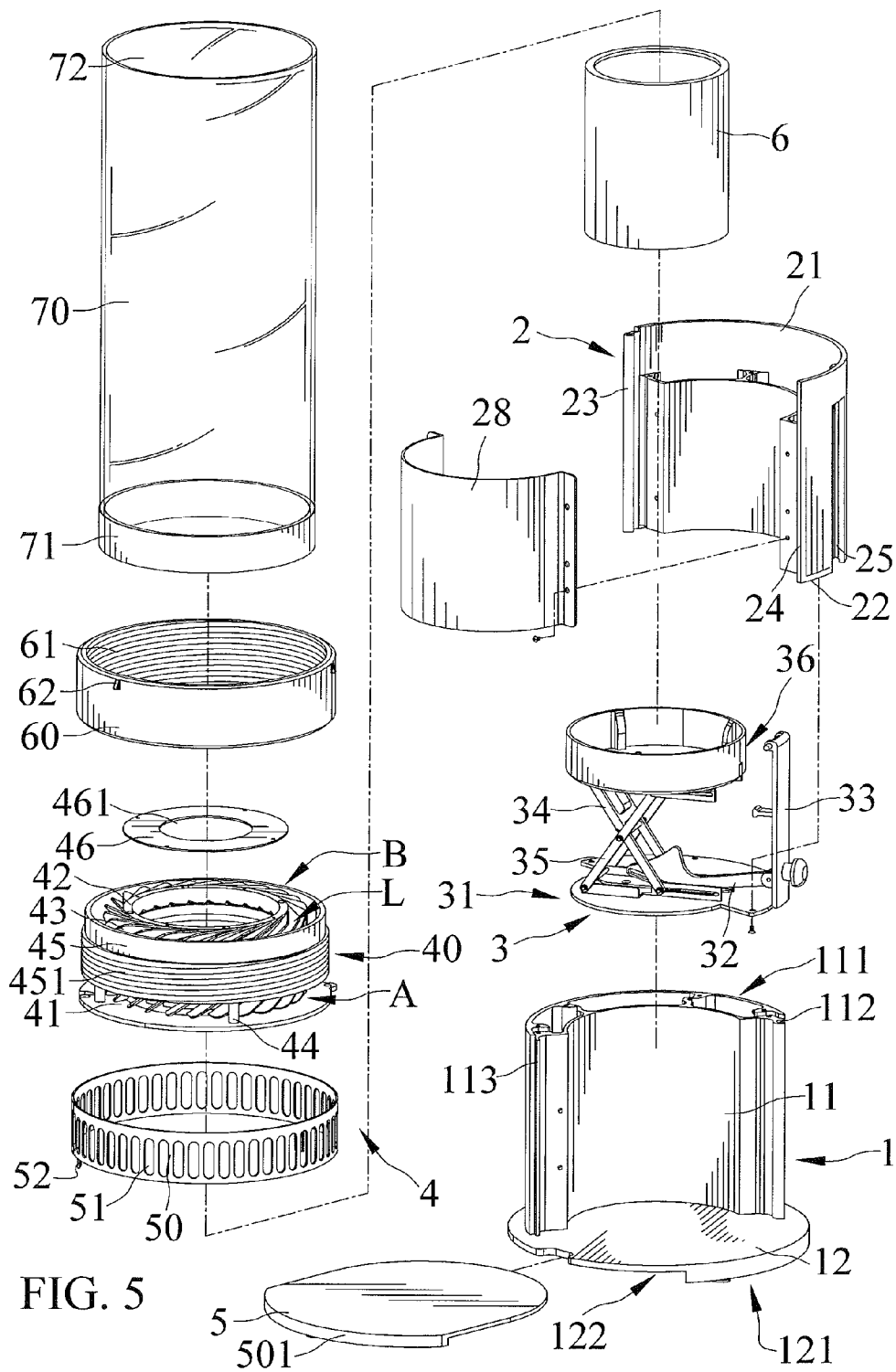
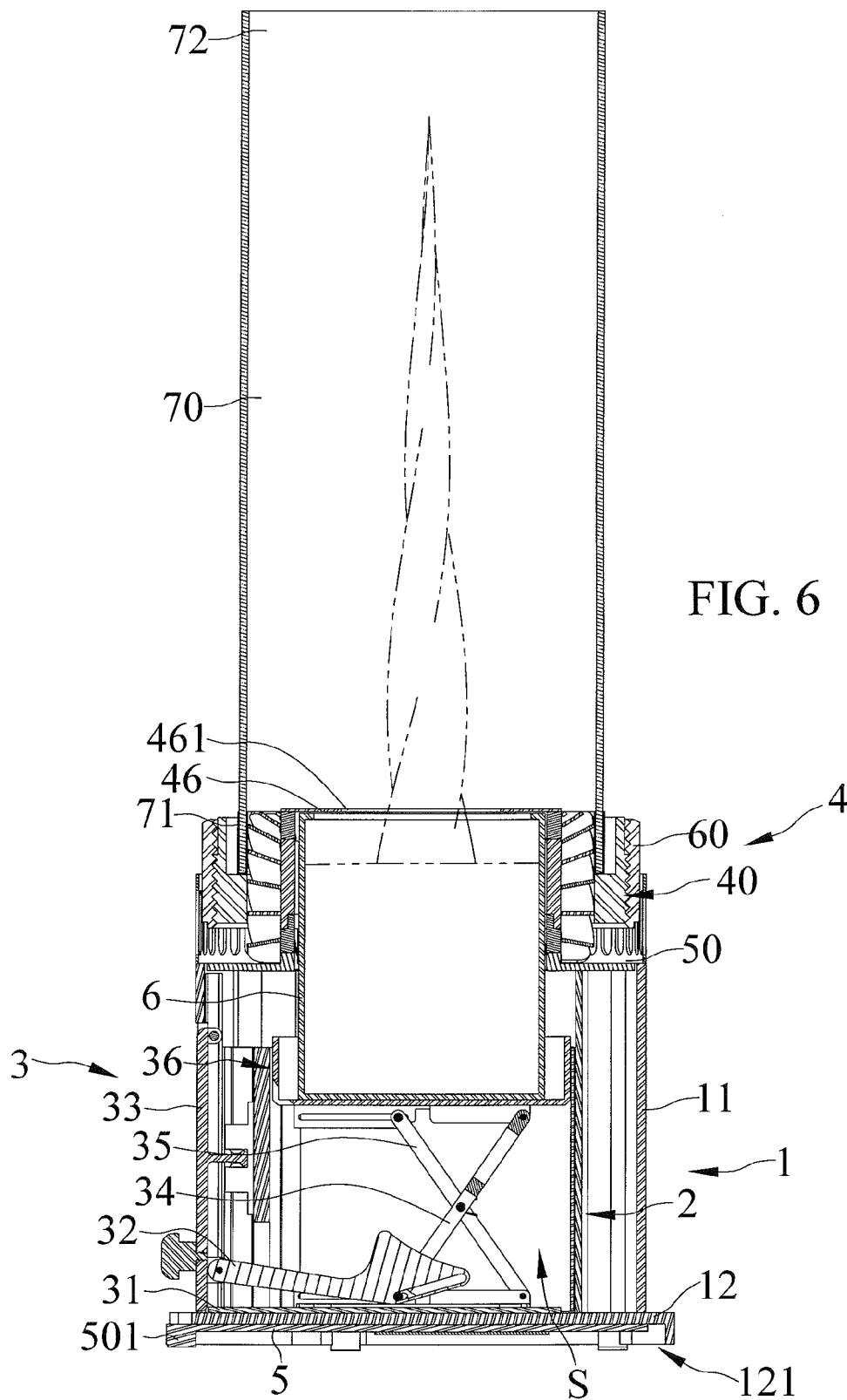


FIG. 3







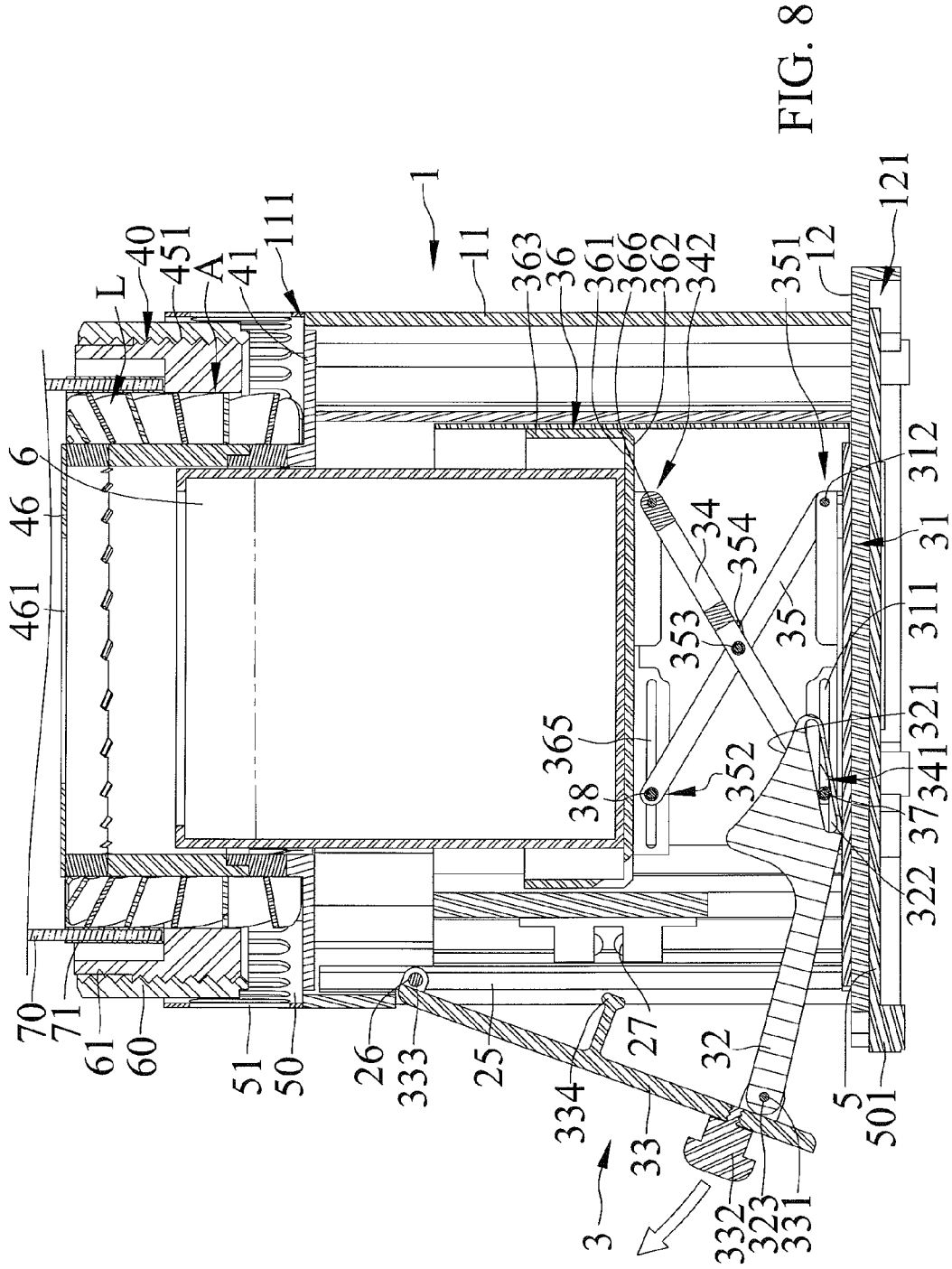
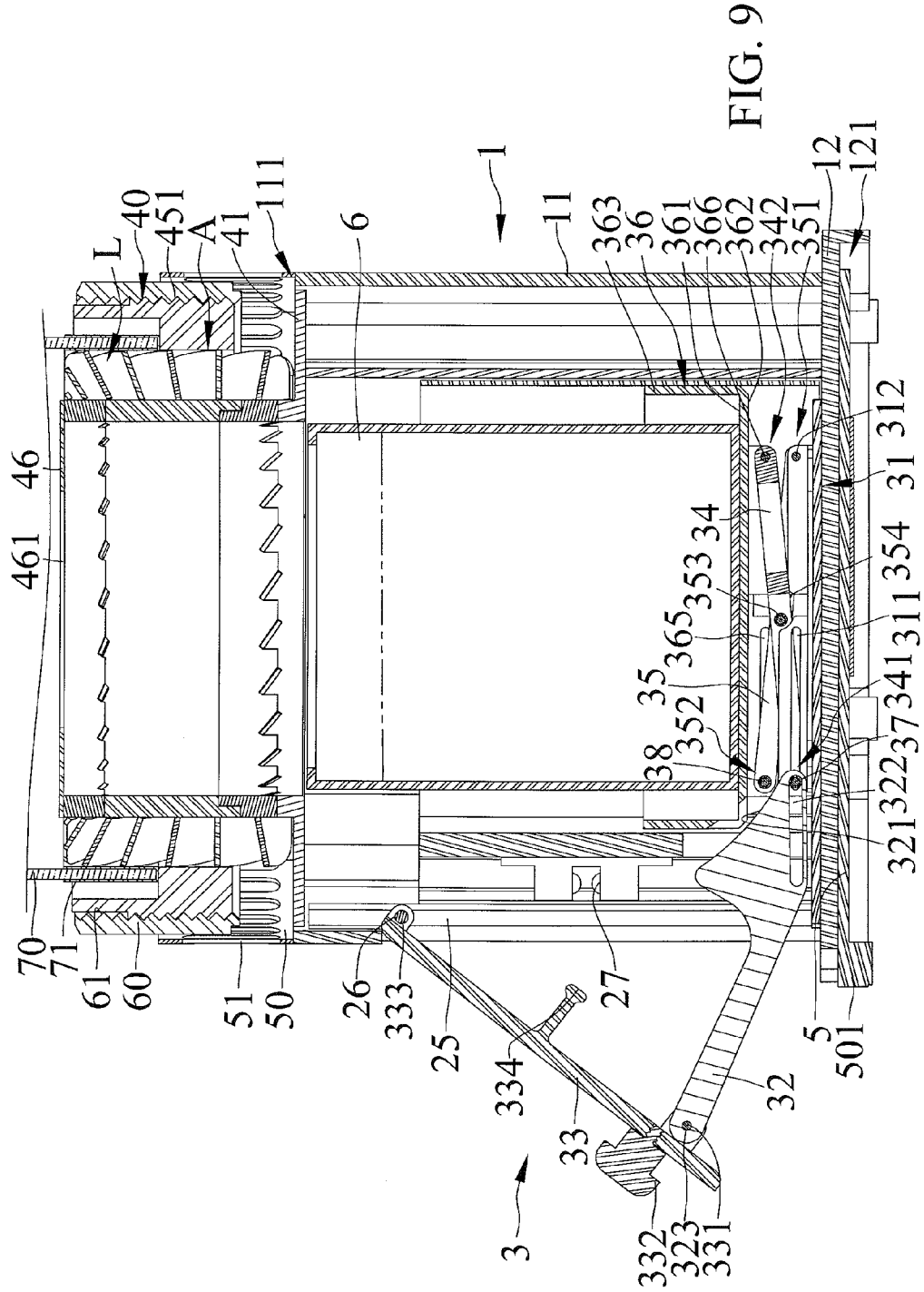
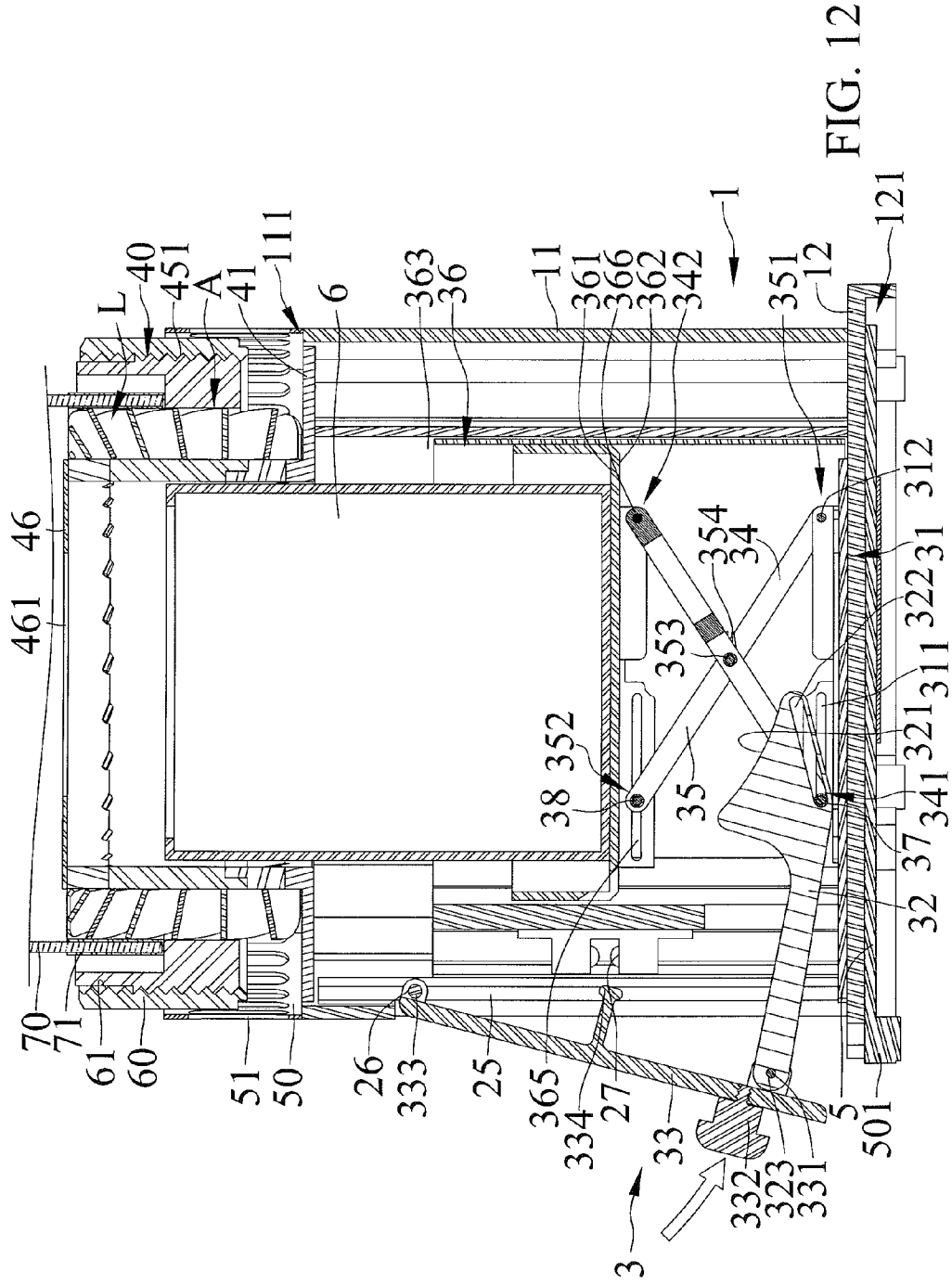
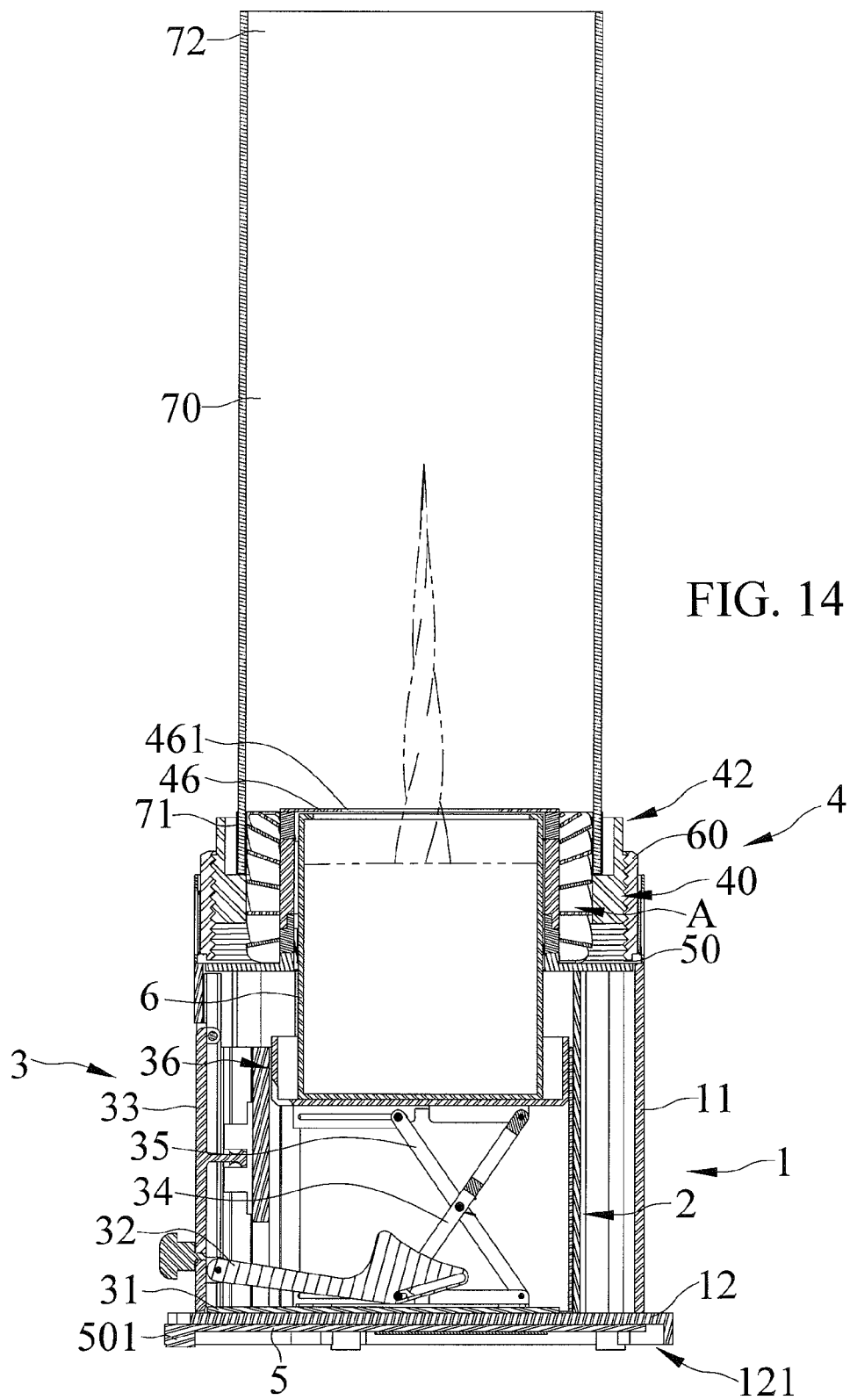
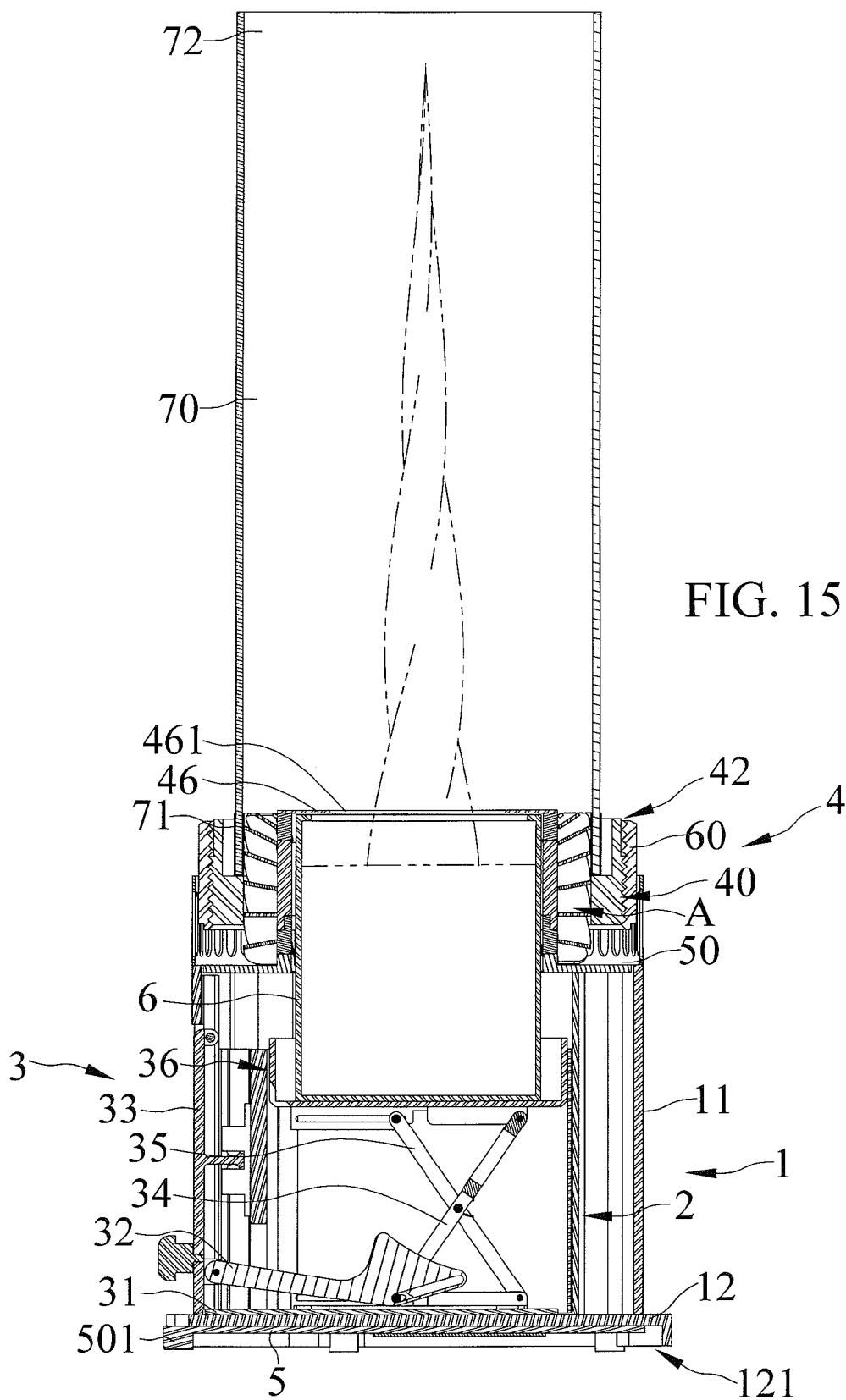


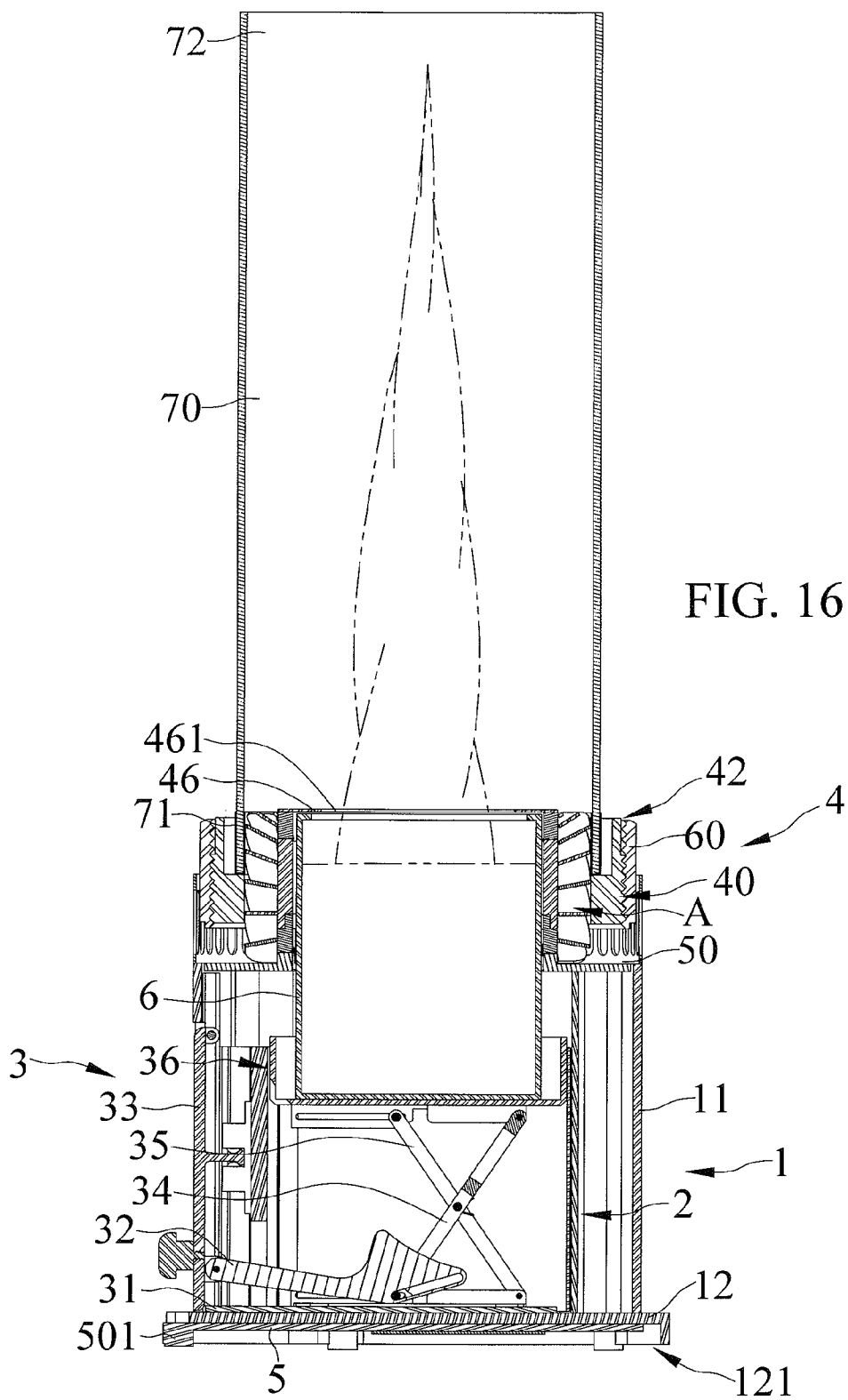
FIG. 8











FLAME DEVICE INCLUDING A LIFT MECHANISM AND CAN LIFT A FLAME TO A PREDETERMINED HEIGHT

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a flame device and, particularly to, a flame device including a lift mechanism and can lift a flame to a predetermined height.

[0003] 2. Description of the Related Art

[0004] U.S. Pat. No. 7,097,448 discloses a vortex type gas lamp for producing an upwardly-directed vortex flame of combustible gas inside a surrounding and confined boundary of rotating body of air. An interface is located between the body of air which is devoid of gas and a central region of gas which is bounded by the interface during the operation of the gas lamp. All of the combustion of gas substantially occurs inside the interface. The gas lamp has a central axis and includes a base supplying combustible gas without air at and nearly adjacent to the central axis. The gas lamp further includes a shield including first and second axially-extending sections structurally attached to the base in a fluid-sealing relationship. The first and second sections are substantially identical and transparent to light and each includes an impermeable wall having an arcuate inner surface and an arcuate outer surface. Furthermore, each of the first and second sections has first and second edges extended axially. The gas lamp yet further includes the first and second walls alternately overlapping one another. The first and second walls are adjacent to their edges and are spaced from one another so as to form tangentially-directed ports, thereby forming an axially-extending chamber open at its side only through the ports. Furthermore, the first and second sections are arranged that at the base they surround the entry of the combustible gas and gas receives air for combustion only through the ports, whereby combustion of the gas results in a flame spaced from the inner surfaces and the peripheral body of air is devoid of gas entering through the ports. Generally, if no air is supplied for combustion, a flame will be put off. Unfortunately, it is not easy to preclude air from entering through the ports. Additionally, the shield is hot and it is not safe to place a covering member in each of the ports.

[0005] Furthermore, U.S. Design Pat. No. 621,873 discloses a fire tornado lamp including a base, and a shield. The base includes a plurality of ports disposed circumferentially. The shield is transparent to light and hollow, that is, it includes a passage extended therein. The base and the shield are connected to each other, and each port extends radially with respect to the passage defined in the shield and communicates therewith. In addition, each port is so configured that it induces air into the passage in a direction substantially tangential to a circumference of the passage. Likewise, it is not easy to preclude air from entering through the ports and not safe to place a covering member in each port.

[0006] The present invention is, therefore, intended to obviate or at least alleviate the problems encountered in the prior art.

SUMMARY OF THE INVENTION

[0007] According to the present invention, a flame device including a lift mechanism and can lift a flame to a predetermined height includes a base, a cover, and a lift mechanism. The base includes a chamber including an opening. The cover

is movably engaged with the base and selectively closes the opening. The lift mechanism includes a supporting member adapted for bearing and moving a fuel container in the chamber to different heights. Fuel is adapted to be contained in the fuel container. Flame is produced after igniting the fuel. The lift mechanism is operably movable in a first direction including the supporting member being moved up from a lower height to a predetermined height and in a second direction including the supporting member being moved down from the predetermined height to the lower height.

[0008] The supporting member is lowered from the predetermined height to a height in which the fuel container is able to be replenished with fuel or replaced.

[0009] It is an objective of the present invention to allow a user to safely ignite the fuel and to facilitate the removal of the fuel container.

[0010] Other objects, advantages, and new features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanied drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a perspective view of a flame device including a lift mechanism for moving a flame to a predetermined height in accordance with the present invention.

[0012] FIG. 2 is another perspective view of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1.

[0013] FIG. 3 is a perspective view of a lift mechanism of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1.

[0014] FIG. 4 is an exploded perspective view of lift mechanism shown in FIG. 3.

[0015] FIG. 5 is an exploded perspective view of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1.

[0016] FIG. 6 is a cross-sectional view of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1 and illustrates the flame device including a lift mechanism for moving a flame to a predetermined height displaying a flame.

[0017] FIG. 7 is a partial, enlarged view of FIG. 6.

[0018] FIG. 8 is an extended cross-sectional view of FIG. 7, with the lift mechanism moved to an operating position such that a fuel container is at an elevation lower than that shown in FIG. 7.

[0019] FIG. 9 is an extended cross-sectional view of FIG. 8, with the lift mechanism moved to an operating position such that a fuel container is at an elevation lower than that shown in FIG. 8.

[0020] FIG. 10 is a cross-sectional view showing the lift mechanism being moved from the operating position shown in FIG. 9 in a direction to cause the fuel container to be elevated.

[0021] FIG. 11 is an extended cross-sectional view of FIG. 10, with the lift mechanism moved to an operating position such that the fuel container is at an elevation higher than that shown in FIG. 10.

[0022] FIG. 12 is an extended cross-sectional view of FIG. 11, with the lift mechanism moved to an operating position such that the fuel container is at an elevation higher than that shown in FIG. 11.

[0023] FIG. 13 is an extended cross-sectional view of FIG. 12, with the lift mechanism moved to an operating position

such that the fuel container is at an elevation higher than that shown in FIG. 11, with the cover disposed in a different position than that shown in FIG. 12 and atop a shield.

[0024] FIG. 14 is a cross-sectional view of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1 and illustrates the flame device including a lift mechanism for moving a flame to a predetermined height displaying a flame.

[0025] FIG. 15 is a cross-sectional view of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1 and illustrates the flame device including a lift mechanism for moving a flame to a predetermined height displaying a flame with a size larger than that shown in FIG. 14.

[0026] FIG. 16 is a cross-sectional view of the flame device including a lift mechanism for moving a flame to a predetermined height of FIG. 1 and illustrates the flame device including a lift mechanism for moving a flame to a predetermined height displaying a flame with a size larger than that shown in FIG. 15.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0027] FIGS. 1 through 16 show a flame device of the present invention. The flame device can lift a flame to a predetermined height. The flame device includes a base 1, a cover 2, and the lift mechanism 3.

[0028] The base 1 includes a chamber S including an opening. The base 1 has a shape including a lateral wall 11 and a foundation 12. The lateral wall 11 is extended upwardly from the foundation 12. The lateral wall defines a top end 111 and first and second engaging edges 112 and 113. The lateral wall 11 has a height, and the top end 111 is disposed at the height from the foundation 12. The foundation 12 defines a bottom side 121 and including a cell 122 extended therein. Further, a cap 5 is releasably received in the cell 122. The cap 5 includes a flange 501 extended therefrom. The flange 501 is adapted to facilitate the release of the cap 5 from the cell 122.

[0029] The cover 2 is movably engaged with the base 1 and selectively closing the opening. The cover 2 includes a peripheral wall including a receptacle 25 extended therein. The cover 2 further includes a hole 26. The cover 2 defines a top edge 21 and a bottom edge 22. The cover 2 includes two lateral edges extended from the top edge 21 to the bottom edge 22. One of the lateral edges defines a first fixing edge 23. The first fixing edge 23 is pivotally engaged with the base 1, with the first fixing edge 23 pivotally engaged with the first engaging edge 112 of the lateral wall 11 of the base 1. The other lateral edge defines a second fixing edge 24. The second fixing edge 24 is selectively engaged with the second engaging edge 113 of the lateral wall 11 of the base 1. The cover closing the opening of the chamber S of the base 1 includes the second fixing edge 24 engaged with the second engaging edge 113 of the lateral wall 11 of the base 1. The cover 2 also defines a retaining section 27.

[0030] The lift mechanism 3 is mounted on the cover 2 and positionable outside the chamber S. The lift mechanism 3 includes a platform 31, a pushing member 32, a control member 33, and a linkage including first and second links 34 and 35, and a supporting member 36. The platform 31 includes at least one first groove 311 and at least one first orifice 312. The pushing member 32 defines a pushing end 321 and a connecting end 323 and includes a channel 322 extended therein. The control member 33 is pivotally engaged with the pushing

member 32, with the control member 33 defining a first joining end 331 pivotally engaged with the connecting end 323 of the pushing member 32. Moreover, the control member 33 is pivotally engaged with the cover 2, with the control member 33 defining a second joining end 333 pivotally engaged with the cover 2. The control member 33 is movable to a position in which the control member 33 is received within the receptacle completely. The control member 33 completely received in the receptacle 25 is flush with the peripheral wall of the cover 2. The cover 2 includes the hole 26 pivotally receiving the control member 33. The control member 33 includes a locking section 334 extended therefrom. The control member 33 is adapted to be locked in the receptacle 25, with the locking section 334 engaged with the retaining section 27. The locking section 334 is disengaged from the retaining section 27 when the control member 33 is not locked. The control member 33 further includes a handle 332 protruded therefrom and exposed. The handle 332 facilitates selective engagement of the control member 33 with the retaining section 27 of the cover 2. The first link 34 defines first and second ends 341 and 342 and the second link 35 defines third and fourth ends 351 and 352 respectively. The first and second links 34 and 35 are biased with respect to each other by a biasing member 354. The biasing member 354 is received on a shaft 353. The biasing member 354 is a torque spring. The first and second links 34 and 35 include the shaft engaged therewith. The supporting member 36 is adapted for bearing and moving a fuel container 6 in the chamber S to different heights. Fuel is adapted to be contained in the fuel container 6. A flame is produced after igniting the fuel. The fuel is ethanol based. The supporting member 36 also includes an annular wall 363 and at least one limiting member 364 disposed within an inner side of the annular wall 363 and extended in a radial direction. The at least one limiting member 364 can abut against and enable the fuel container 6 to be held securely. The supporting member 36 further includes at least one second groove 365 and at least one second orifice 366. The first end 341 of the first link 34 and the pushing member 32 include a first pivot 37 engaged therewith. The first pivot 37 is movably engaged in the at least one first groove 311 and the channel 322. The second end 342 of the first link 34 is pivotally engaged with the supporting member 36 about a first axle. The first axle is fixedly disposed and inserted through the at least one second orifice 366. The third end 351 of the second link 35 is pivotally engaged with the platform 31 about a second axle. The second axle is fixedly disposed and inserted through the at least one first orifice 312. The fourth end 352 of the second link 35 and the supporting member 36 include a second pivot 38 engaged therewith. The second pivot 38 is movably engaged in the at least one second groove 365. Additionally, the cover 2 includes a limiting wall 28. The limiting wall 28 circumferentially encases the platform 31 and the supporting member 36.

[0031] The lift mechanism 3 is operably movable in a first direction including the supporting member 36 being moved up from a lower height to a predetermined height and in a second direction including the supporting member 36 being moved down from the predetermined height to the lower height. The supporting member 36 is lowered from the predetermined height to a height in which the fuel container is able to be replenished with fuel or replaced.

[0032] The pushing member 32 includes a surface forming a slope and facilitating the supporting member 36 moving from the lower height to the predetermined height.

[0033] Further, a flame control mechanism 4 is disposed atop of the base 1 for making the flame device displaying a stable and augmented vortex flame and making air induced into the flame device swirl and increasing the flow speed of the air and making the air flow to a higher height and cooling and dissipating heats of the parts thereof. The flame control mechanism 4 includes a fluid guiding member 40, a venting member 50, a flow-rate adjusting member 60, and a shield 70. The fluid guiding member 40 has a first distal end 41 defining a fluid-entry end A and a second distal end 42 defining a fluid-exit end B. The fluid guiding member 40 includes a cavity extended therethrough. The fuel container 6 is adapted to be inserted in the cavity. The fuel container 6 disposed at the predetermined height is not extended above the distal end 42. The fluid guiding member 40 includes a plurality of vanes 43, at least one fixing member 44, a covering member 45, and an annular member 46. The fluid guiding member 40 includes the second distal end 42 receiving the annular member 46. The annular member 46 is adapted to limit a diametrical size of the flame. The annular member 46 includes a through hole 461 extended therein. The through hole 461 delimits the diametrical size of the flame. The plurality of vanes 43 are extended from the fluid-entry end A to the fluid-exit end B and circumferentially disposed and spaced from one another. Two of the plurality of vanes include a space defined therebetween. The space defines a passage L which is spiral-shaped. The covering member 45 is fixedly disposed by the at least one fixing member 44. The plurality of vanes 43 are circumferentially covered by the covering member 45. Each of the plurality of vanes 43 in the flow-intake end A is exposed to outside and not covered by the covering member 45. The covering member 45 includes an outer periphery including a first engaging section 451 defined thereon. The venting member 50 includes at least one vent hole 51 exposed to outside and in fluidal communication with the fluid guiding member 40. The venting member 50 includes a fixing section 52 extended therefrom and engaged with the top end 111 of the base 1. The flow-rate adjusting member 60 includes an inner periphery including a second engaging section 61 defined thereon. The first and second engaging sections 451 and 61 are adjustably engaged with each other. The first engaging section 451 forms an outer thread and the second engaging section 61 forms an inner thread respectively. The flow-rate adjusting member 60 includes an outer periphery including the at least one projection 62 extended therefrom. The at least one projection 62 is adapted for facilitating the operation of the flow-rate adjusting member 60. The flow-rate adjusting member 60 is engaged with the fluid guiding member 40 and operably adjustable to different positions defined between the fluid guiding member 40 and the venting member 50. The flame device displaying a larger size flame including the flow-rate adjusting member 60 disposed at a first position in which the at least one vent hole 51 has a larger area in fluidal communication with the fluid guiding member 40. The flame device displaying a smaller flame including the flow rate adjusting member 60 disposed at a second position in which the at least one vent hole 51 has a smaller area in fluidal communication with the fluid guiding member 40. The shield 70 includes a hollow structure and disposed above the fluid guiding member 40 and extended in an upward direction. The shield 70 includes two ends forming first and second open ends 71 and 72 respectively. The flame is adapted to be put off by including the open end 72 covered by the cap 5. Consequently, the user can put off the flame safely.

[0034] While the specific embodiment has been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of invention, and the scope of invention is only limited by the scope of the accompanying claims.

What is claimed is:

1. A flame device including a lift mechanism and can lift a flame to a predetermined height, comprising:

- a base including a chamber including an opening;
- a cover movably engaged with the base and selectively closing the opening; and
- a lift mechanism including a supporting member adapted for bearing and lifting a fuel container in the chamber to different heights, with fuel adapted to be contained in the fuel container, with the fuel adapted to be ignited and produce a flame, with the lift mechanism operably movable in a first direction including the supporting member being moved up from a lower height to a predetermined height and in a second direction including the supporting member being moved down from the predetermined height to the lower height;

wherein the supporting member is lowered from the predetermined height to a height in which the fuel container is able to be replenished with fuel or replaced.

2. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 1, wherein the lift mechanism is mounted on the cover and positionable outside the chamber.

3. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 1, wherein the lift mechanism includes a platform, a pushing member, a control member, and a linkage including first and second links, with the platform including at least one first groove and at least one first orifice, with the pushing member defining a pushing end and a connecting end and including a channel extended therein, with the control member pivotally engaged with the pushing member, with the control member defining a first joining end pivotally engaged with the connecting end of the pushing member, with the first link defining first and second ends and the second link defining third and fourth ends respectively, with the supporting member including at least one second groove and at least one second orifice, with the first end of the first link and the pushing member including a first pivot engaged therewith, with the first pivot movably engaged in the at least one first groove and the channel, with the second end of the first link pivotally engaged with the supporting member about a first axle, with the first axle fixedly disposed and inserted through the at least one second orifice, with the third end of the second link pivotally engaged with the platform about a second axle, with the second axle fixedly disposed and inserted through the at least one first orifice, with the fourth end of the second link and the supporting member including a second pivot engaged therewith, with the second pivot movably engaged in the at least one second groove.

4. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 3, wherein the control member is pivotally engaged with the cover, with the control member defining a second joining end pivotally engaged with the cover.

5. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 2, wherein the cover includes a peripheral wall including a receptacle extended therein, wherein the control member is

movable to a position in which the control member is received within the receptacle completely.

6. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 5, wherein the control member completely received in the receptacle is flush with the peripheral wall of the cover.

7. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 3, wherein the first and second links are biased with respect to each other by a biasing member, wherein the biasing member is received on a shaft, wherein the first and second links include the shaft engaged therewith.

8. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 7, wherein the biasing member is a torque spring.

9. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 1 further comprising a flame control mechanism disposed atop of the base for making the flame device displaying a stable and augmented vortex flame and making air induced into the flame device swirl and increasing the flow speed of the air and making the air flow to a higher height and cooling and dissipating heats of the parts thereof, with the flame control mechanism including a fluid guiding member, a venting member, a flow-rate adjusting member, and a shield, with the venting member including at least one vent hole exposed to outside and in fluidal communication with the fluid guiding member, with the flow-rate adjusting member engaged with the fluid guiding member and operably adjustable to different positions defined between the fluid guiding member and the venting member, with the flame device displaying a larger size flame including the flow-rate adjusting member disposed at a first position in which the at least one vent hole has a larger area in fluidal communication with the fluid guiding member, with the flame device displaying a smaller flame including the flow rate adjusting member disposed at a second position in which the at least one vent hole has a smaller area in fluidal communication with the fluid guiding member, with the

shield including a hollow structure and disposed above the fluid guiding member and extended in an upward direction.

10. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 9, wherein the fluid guiding member has a first distal end defining a fluid-entry end and a second distal end defining a fluid-exit end, wherein the fluid guiding member includes a plurality of vanes, at least one fixing member, and a covering member, with the plurality of vanes extended from the fluid-entry end to the fluid-exit end and circumferentially disposed and spaced from one another, with two of the plurality of vanes include a space defined therebetween, with the space defining a passage which is spiral-shaped, with the covering member fixedly disposed by the at least one fixing member, with the plurality of vanes circumferentially covered by the covering member, with each of the plurality of vanes in the flow-intake end exposed to outside and not covered by the covering member

11. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 10, wherein the fluid guiding member includes the second distal end receiving an annular member which is adapted to limit a diametrical size of the flame, with the annular member including a through hole extended therein, with the through hole delimiting the diametrical size of the flame.

12. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 3, wherein the pushing member includes a surface forming a slope and facilitating the supporting member moving from the lower height to the predetermined height.

13. The flame device including a lift mechanism and can lift a flame to a predetermined height as claimed in claim 9, wherein the base includes a cell extended therein, wherein a cap is releasably received in the cell, wherein the shield includes an open end, wherein the flame is adapted to be put off by including the open end covered by the cap.

* * * * *