April 12, 1938. L. V. ARONSON 2,113,975

PYROPHORIC LIGHTING MECHANISM

Filed Feb. 24, 1936 2 Sheets-Sheet 1

Fig. 1.

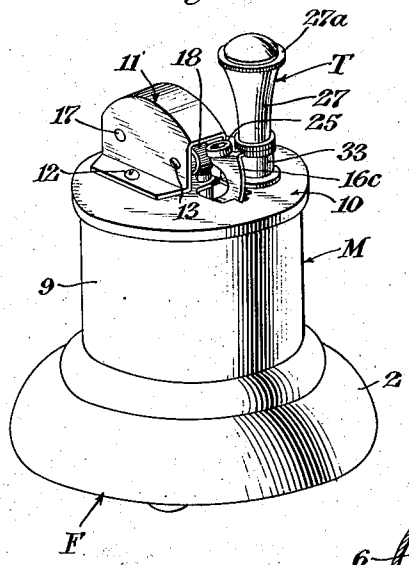

Fig. 4.

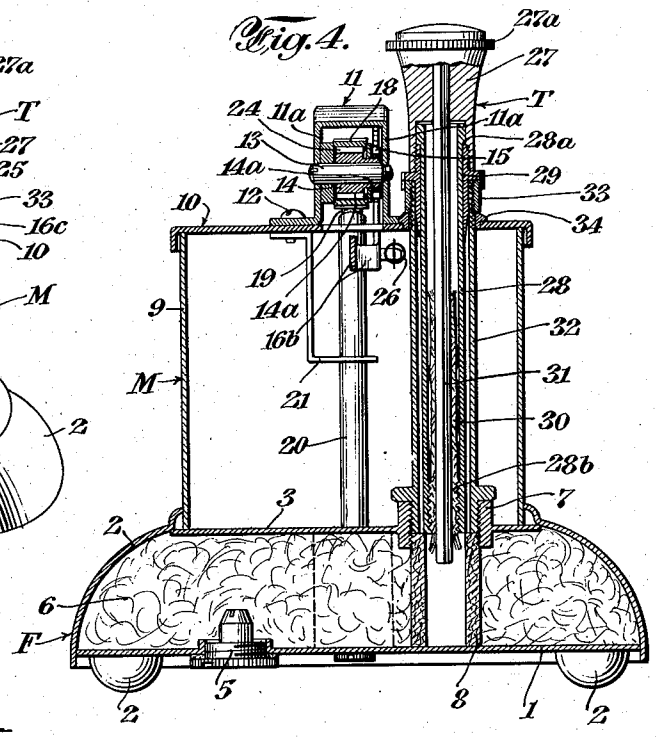

Fig. 2.

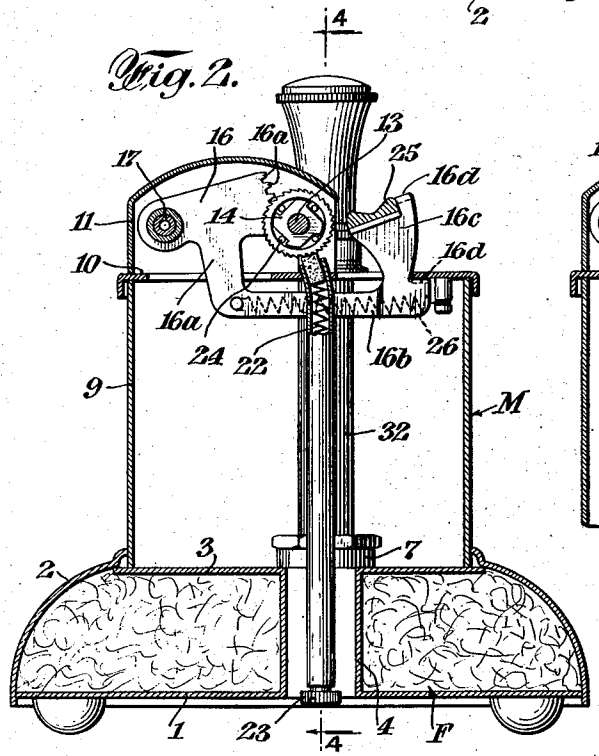

Fig. 3.

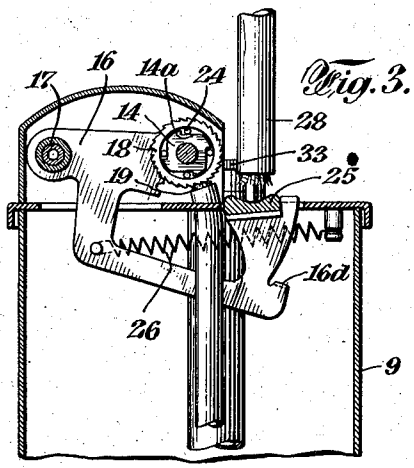

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Fig. 5.

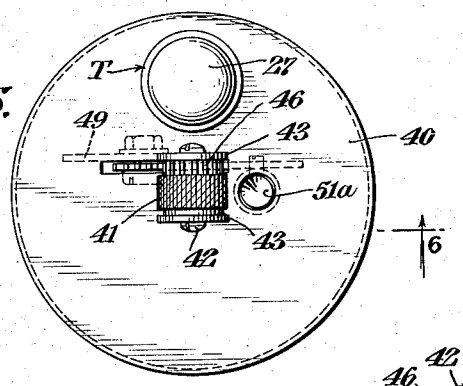


Fig. 6.

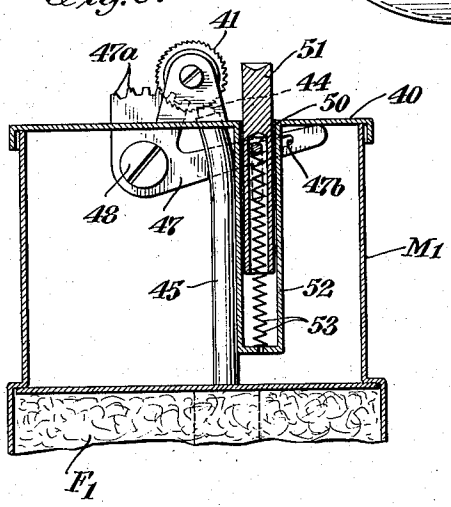


Fig. 7.

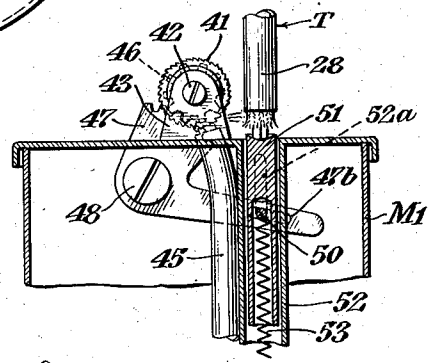


Fig. 9.

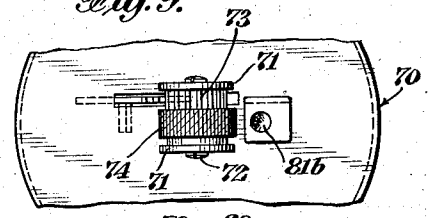
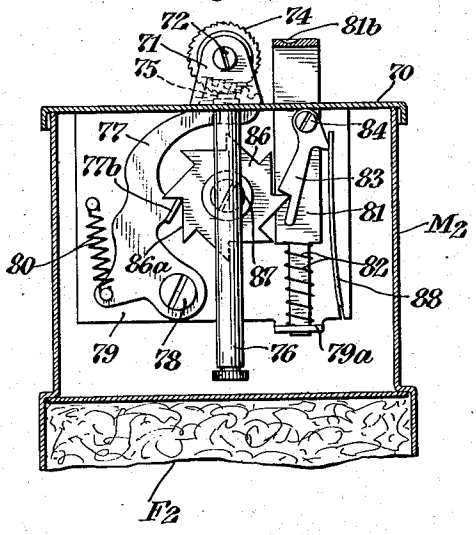


Fig. 8.



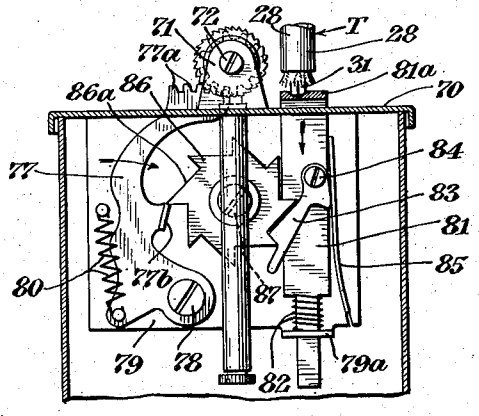


Fig. 10.

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UNITED STATES PATENT OFFICE

2,113,975

PYROPHORIC LIGHTING MECHANISM

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Application February 24, 1936, Serial No. 65,265

12 Claims. (Cl. 67—4.1)

My invention relates to pyrophoric lighting mechanism of the type utilizing a torch for actuating the sparking device.

My invention has particular reference to pyrophoric lighting mechanism wherein movement of a torch along a path produces a continuous stream of sparks which are projected toward said torch for the purpose of producing a freely burning flame.

Various other objects, advantages and characteristics of my invention will become apparent from the following description.

My invention resides in the pyrophoric lighting mechanism, features, combinations and arrangements of the character hereinafter described and claimed.

For an understanding of my invention and for an illustration of some of the forms thereof, reference is to be had to the accompanying drawings, in which:

Figure 1 is a perspective view of pyrophoric lighting mechanism as constructed in accordance with my invention;

Fig. 2 is a vertical sectional view, partly in elevation, of the mechanism shown in Fig. 1;

Fig. 3 is a vertical sectional view, partly in elevation, of the mechanism illustrated in Fig. 2 with some of the parts shown in different positions;

Fig. 4 is a vertical sectional view, partly in elevation, and is taken on the line 4—4 of Fig. 2 looking in the direction of the arrows;

Fig. 5 is a plan view showing a modification of the invention;

Fig. 6 is a vertical sectional view partly in elevation, and is taken on the line 6—6 of Fig. 5 looking in the direction of the arrows;

Fig. 7 is a vertical sectional view, partly in elevation, of the mechanism illustrated in Fig. 6 with some of the parts shown in different positions;

Fig. 8 is a vertical sectional view, partly in elevation, of a modified form of the invention;

Fig. 9 is a plan view of the arrangement shown in Fig. 8; and

Fig. 10 is a vertical sectional view, partly in elevation, of the mechanism illustrated in Fig. 8 with some of the parts shown in different positions.

Referring to Figs. 1, 2 and 4, F represents a fuel casing with which is associated a main casing M, the latter, in any suitable manner, being supported upon and secured to said fuel casing F, and both casings being constructed from suitable sheet metal as desired.

The fuel casing F may be of any suitable configuration and, as herein shown, this casing comprises a bottom wall 1 to the lower surface of which are secured a plurality of pads of rubber or the like, these pads being adapted to support the lighting mechanism upon a table or other suitable surface. Suitably secured to the bottom wall 1, is a side wall 2 which may be of curved configuration as shown or which may be of any other suitable configuration as desired. The side wall 2 is closed by a top wall 3 which, preferably, is horizontally disposed as illustrated in Figs. 2 and 4. As shown in Fig. 2, a tubular member 4 joins the bottom wall 1 and the top wall 3 of the fuel casing F, this tubular member defining an open passage utilizable as hereinafter described. It will be understood that adjacent surfaces of the various walls 1, 2 and 3 together with adjacent surfaces of the walls 1, 3 and the tubular member 4 are soldered or otherwise suitably secured together so as to form sealed junctions at these various adjacent surfaces.

In accordance with the invention, one wall of the fuel casing F as, for example, the bottom wall 1 thereof may be provided with an opening which is normally closed by a cap 5. Upon removal of this cap 5, as will be understood, suitable fuel, as a high test gasoline, may be introduced interiorly of the fuel casing F, such fuel being held in suspension by the cotton 6 or other absorbent material contained in said fuel casing F.

As shown in Fig. 4, the top wall 3 of the fuel casing F carries a tubular member 7 having its axis vertically disposed and defining a passage which opens into said fuel casing. Disposed interiorly of the fuel casing F, in longitudinal alinement with the passage defined by the tubular member 7, is a suitable tubular structure 8 formed of felt or the like, said structure 8 as hereinafter more fully described, being adapted to receive the lower end of a torch T, and said tubular structure 8 being of any suitable detailed construction such, for example, as more particularly described in my pending application Serial No. 727,060, filed May 23, 1934.

The main casing M is constituted by a tubular shell 9 which, preferably, is suitably secured in detached position on the fuel casing F. This shell 9, as shown on the drawings, has secured thereto, preferably in detachable manner, a top wall 10 which forms a support for various parts of the lighting mechanism as hereinafter more fully described.

As shown on the drawings, a small housing 11 is supported by the main casing wall 10, this housing 11 preferably comprising a pair of spaced ver-

tical wall sections 11a having lower flanged terminals secured to said top wall 10 by screws 12 or the like.

The housing 11 forms an enclosure for the sparking device of my novel mechanism and for the various operating parts therefor. As herein shown, a pin or axle 13 is fixed in horizontal position to the vertical side walls 11a of the housing 11. Freely rotatable on the axle 13 is a clutch wheel 14 having a hub extension 14a extending from left to right, Fig. 4. Secured to this hub extension 14a is a pinion 15 with which meshes a gear segment 16a of an actuating member constituted by a lever 16 mounted for free oscillatory movement on a member 17 horizontally fixed in the aforesaid walls 11a of the housing 11.

Disposed for rotatable movement on the clutch wheel 14 is a wheel 18 having its outer face serrated or roughened for coaction with a pyrophoric element 19 in part projecting from a tube 20 extending downwardly through the casing M and being suitably anchored to a bracket 21 secured to the lower surface of the top casing wall 10, the tube 20 containing the usual spiral spring 22 which is maintained under compression by a closure cap 23 so as to bias the pyrophoric element 19 into engagement with the serrated wheel 18.

Any suitable form of mechanism may be utilized for transferring energy from the clutch wheel 14 to the serrated wheel 18. To this end, the periphery of the clutch wheel 14 may be shaped to provide a plurality of angular pockets 14a each of which receives a metallic rod 24, or equivalent. As will readily be understood, the rods 24 coact with the interior curved surface of the wheel 18 to produce rotative movement of said wheel 18 in a counter-clockwise direction, Fig. 2, when the clutch wheel 18 is rotated in the same direction. As clearly appears, rotation of the wheel 18 as and in the direction just described effects the production of a shower of pyrophoric sparks which are projected from left to right, Figs. 2 and 3, tangentially with respect to the serrated wheel 18 and through the open side of the housing 11.

The lever 16 comprises an extension 16a extending downwardly through an opening in the casing wall 10, an extension 16b extending horizontally beneath said wall 10, and an extension 16c extending upwardly through said wall 10, said lever extension 16c carrying a cup-shaped member 25 movable through the path of the pyrophoric sparks and with which the lower end of the torch T is adapted to engage as hereinafter more fully described. The lever 16 should be suitably biased in a counter-clockwise direction, Fig. 3, so as to tend to remain in the position shown in Fig. 2. To this end, for example, there may be provided a helical spring 26 which has one end secured to the lever 16 and the other end anchored in fixed position, as by attachment to the casing wall 10. As the parts are positioned in Fig. 3, it is obvious that the spring 26 tends to swing the lever 16 in a counter-clockwise direction.

As shown in Fig. 4, the lever section 16b is curved in such manner that the adjacent lever section 16c is disposed in and moves substantially in the plane of the serrated wheel 18. This, of course, is desirable because insuring that the member 25 shall move in the path of the pyrophoric sparks. In Figs. 2 and 3, the lever section 16b is illustrated as comprising a section 16d which coacts with the top wall to limit movement of the lever 16 in a counter-clockwise direction, Fig. 2.

The torch T which is utilizable for operating the herein described actuating member 16 may be of any suitable character such, for example, as is well known in the art. Thus, if desired, said torch T may comprise a handle section 27 having a serrated surface 27a adapted to be manually gripped. One end of a sleeve 28 is received in a passage formed in one end of said handle section 27, this sleeve being secured to the handle section for rotatable movement only by a sleeve nut 29 which, as shown, engages a shouldered surface 28a of the sleeve 28. Disposed interiorly of said sleeve 28 is a tubular wick 30 formed of suitable material such as is well known to the art. Secured to the handle section 27 is a rod 31 of square or other polygonal configuration, this rod extending interiorly and longitudinally of the wick 30 in close-fitting relation and being of somewhat greater length than the sleeve 28 which, adjacent its lower end, is provided with interior screw threads 28b adapted to be closely engaged by the wick 30.

The wick 30 normally projects beyond the lower end of the sleeve 28 to some extent as indicated. When it becomes desirable to advance or retract said wick 30, the sleeve 28 is held by the fingers of one hand and the handle section 27 is turned in one direction or the other as desired. The rod 31 turns with the handle section 27 and the wick 30 turns with said rod 31. The rod 31 crowds the exterior surface of the wick 30 against the threads 28b and, since said wick turns with respect to the stationary threads 28b as stated above, it results that the wick is either retracted or advanced as desired.

The herein disclosed pyrophoric lighting mechanism of Figs. 1–4 inclusive comprises a tubular member 32 having its lower end disposed in threaded relation with respect to the tubular member 7, Fig. 4. This tubular member 32 is disposed vertically in the main casing M and extends through an opening provided therefor in the upper casing wall. Above said top casing wall 10, the tubular member 32 has a sleeve nut 33 threaded exteriorly thereto in readily detachable manner. The sleeve nut 33 engages a bushing 34 fixed to the top casing wall 10. This sleeve nut, then, maintains said wall 10 in position on the shell 9 and said sleeve nut, acting through the wall 10, maintains said shell 9 in its intended position on the fuel casing F as disclosed.

Normally, the torch T is disposed within the tubular member 32 in such manner that the flanged section of the sleeve nut 29 engages the flush upper surfaces of the tubular member 32 and the sleeve 33. When seated in this position, the lower end of the wick 30 is disposed in fuel-absorbing relation with respect to the fuel contained in the fuel casing F and, as a result, a charge of fuel is absorbed by said wick 30.

When the herein described lighting mechanism of Figs. 1–4 inclusive is to be operated, the torch T is withdrawn from its normal seated position as shown in Fig. 4 and the lower end of the torch rod 31 is disposed in engagement with the cup-shaped member 25. Then, by the application of downward pressure, the actuating lever 16 is swung in a clockwise direction from the position thereof shown in Fig. 2 to the position shown in Fig. 3 and, in so doing, the lower exposed end of the wick 30 is caused to move downwardly through the sparks as they are projected from the serrated wheel 18 when the latter is given a

step of rotative movement under the influence of said downward pressure to the actuating lever 16.

In this manner, the charge of fuel carried by the lower exposed end of the wick 30 is ignited to produce a freely burning flame which may be used to ignite a cigarette, a pipe, or for any other purpose as desired.

When the actuating lever 16 was swung in a clockwise direction from the Fig. 2 position thereof as described above, energy was stored in the spring 26. Accordingly, when the torch T is removed from the cup-shaped member 25, said spring 26 effectively returns the lever 16 to the position thereof shown in Fig. 2 and places the mechanism in condition for a subsequent lighting operation.

An advantage of the invention described above relates to the mechanical arrangement whereby energy is transferred from the torch to the serrated wheel in the direct sense that there is no temporary storage of such energy in a spring. It results, therefore, that the pyrophoric sparks are produced continuously during descending movement of the torch. This type of operation is desirable because contributing to the quick and efficient ignition of the charge of fuel carried by said torch. In the appended claims, the references to the transmission of force "directly to said sparking wheel" shall be understood as describing the transfer of force through a mechanical connection and as excluding the storage of such force in a spring, or equivalent.

In the modified form of my invention shown in Figs. 5, 6 and 7, M1 represents a main casing which, in any suitable manner is associated with a fuel casing F1. The main casing M1 comprises a top wall 40 serving, in the manner hereinafter described, as a support for the various parts of the pyrophoric lighting mechanism.

As herein shown, the lighting mechanism of Figs. 5, 6 and 7 comprises a serrated wheel 41 which is freely rotatable on a pin or axle 42 horizontally disposed in standards 43 upstanding from and secured to the top casing wall 40. Coactable with the serrated wheel 41 is the usual pyrophoric element 44 which, in part, projects from a tube 45 suitably anchored in position interiorly of the main casing M1, said tube 45 containing a helical spring, not shown, maintained under compression in the usual manner so as to bias the pyrophoric element 44 into engagement with the serrated wheel 41.

Disposed in side-by-side relation with respect to the serrated wheel 41 is a pinion 46, this pinion being loosely mounted upon the pin 42 the same as the serrated wheel 41. Coactable with the pinion 46 is a gear segment 47*a* forming the terminal portion of one arm of a lever 47 pivoted at 48 on a member 49 anchored in suitable manner to the top casing wall 40. The other arm of the lever 47 terminates in an elongated slot 47*b* which receives a pin 50 horizontally anchored in a plunger 51 which is mounted for vertical reciprocatory movement in a tubular member 52 secured to and depending from the top casing wall 40. As shown, the tubular member 52 is formed with alined elongated slots 52*a* through which the pin 50 extends, an arrangement of this character permitting vertical reciprocatory movement of the plunger 51. As appears from a consideration of Fig. 6, the plunger 51 is suitably biased in an upward direction, as by a helical spring 53.

Any suitable arrangement such, for example, as described in connection with Figs. 1–4 may be provided for clutching the serrated wheel 41 to the pinion 46 when the latter is moved in a counter-clockwise direction, Fig. 6, under the control of the lever 47, such arrangement, as will be understood, permitting the pinion 46 to slip with respect to the stationary serrated wheel 41 when said pinion 46 is moved clockwise, Fig. 7.

In operation, a torch T which, if desired, may be of the character hereinbefore described is withdrawn from its seat and placed in engagement with a depression 51*a* formed in the upper end of the plunger 51. Then, by the application of downward pressure, the plunger 51 is moved downwardly from its Fig. 6 position to the position thereof shown in Fig. 7. In so doing, the pin 50 rides in the slots 47*b*, 52*a* and causes the lever 47 to swing from its Fig. 6 to its Fig. 7 position. As a result, the serrated wheel 41 is given a step of movement in a counterclockwise direction, Fig. 6, to thereby produce a shower of pyrophoric sparks which are projected toward and into engagement with the exposed end of the wick 30 as the torch T is moved downwardly in the manner described. In this way, a freely burning flame is produced at the end of the torch T and, when this flame has served its intended purpose, said torch may be seated in and on the casing M1.

Upon removal of the torch T from the tubular member 51, the latter rises under the influence of the spring 53 and returns the parts to their normal positions as shown in Fig. 6.

It will readily be understood that the mechanism of Figs. 5, 6 and 7 operates in substantially the same manner as the mechanism illustrated in Figs. 1–4 inclusive. That is, movement of the torch T transmits energy directly to the serrated wheel and such energy is not stored in any spring, or equivalent. As a result, a stream of pyrophoric sparks are produced for an appreciable period of time and, since the fuel-charged wick is passed through these sparks, it necessarily results that the desired burning flame is quickly and efficiently produced.

In Figs. 8, 9 and 10, I have illustrated an inventive arrangement wherein the shower of pyrophoric sparks is produced suddenly by release of the energy stored in a spring. Thus, in said Figs. 8, 9 and 10, M2 represents a main casing with which, in suitable manner, a fuel casing F2 is associated. The main casing M2 comprises a top wall 70 which, in generally the same manner as hereinbefore described, forms a support for the various parts of the lighting mechanism.

Upstanding from the top casing wall 70 are the spaced standards 71 which support a pin or member 72 horizontally fixed in position thereon. The member 72, in freely rotatable manner, supports a pair of side-by-side wheels 73, 74, the wheel 73 being a pinion and the wheel 74 being serrated on its outer peripheral surface so as to be coactable with a pyrophoric element 75 which, in part, projects from a tube 76 extending downwardly through the main casing M2 and anchored thereto, the tube 76, as well known in the art, containing a helical spring, not shown, suitably maintained under compression so as to bias the pyrophoric element 75 into engagement with the serrated wheel 74.

Coactable with the pinion 73 are the gear teeth 77*a* forming the end of a lever 77 mounted for pivotal movement on a pin 78 supported by a plate 79 secured to and depending from the top casing wall 70, the lever 77 being suitably biased

in a clockwise direction, Fig. 10, as by a helical spring 80 having one end secured to the plate 79 and the other end thereof secured to said lever 77.

Mounted for vertical reciprocatory movement in the top casing wall 70 and in an angular section 79a of the plate 79 is an actuating member 81 which, at its upper end, terminates in an angular section 81a movable along a vertical path disposed above the top casing wall 70 and said angular section 81a having a depression 81b formed therein for the reception of the lower end of a torch and this depression being in line with the plane of the wheel 74. The actuating member 81 is biased in an upward direction from the position shown in Fig. 10 by a helical spring 82 which is confined between the angular plate section 79a and a shouldered section of the actuating member 81.

In accordance with the invention, the actuating member 81 is adapted to be connected to the lever 77 so that energy may be transferred from said actuating member 81 to said lever 77. The mechanism for accomplishing this purpose may be of any suitable character and, as herein shown, such mechanism comprises a lever 83 which is pivoted at 84 to the actuating member 81, said lever 83 being biased in a clockwise direction, Fig. 10, by a leaf spring 85, or equivalent. The lever 83 terminates in a notched end which coacts with a notched wheel 86 mounted for rotatable movement on a pin 87 extending horizontally from the plate 79, the wheel 86 also being coactable with a lateral section 77b of the lever 77.

Normally, the parts are positioned as shown in Fig. 8 wherein the lever 83 is illustrated as coacting with the lower surface of the top wall 70 to prevent further upward movement of the member 81 under the influence of the spring 82. When thus positioned, the lower end of the rod 31 of the torch T, or equivalent, may be disposed in the depression 81b of the actuating member 81 and said member 81 lowered to the position shown in Fig. 10. In so doing, the lever 83 remains in engagement with a notched surface of the wheel 86 and causes said wheel to move in a clockwise direction, Fig. 10. As the wheel 86 thus moves, an inclined surface 86a thereof engages the lever section 77b and causes the lever 77 to swing in a counter-clockwise direction, Fig. 8, with resultant expansion and storage of energy in the spring 80.

As will readily be understood, a clutch mechanism is interposed between the two wheels 73 and 74 and, when the lever 77 moves as just described, the arrangement of this clutch mechanism is such that the pinion 73 idles with respect to the serrated wheel 74 which remains stationary at this time.

Eventually, as the wheel 86 moves a further slight increased distance in a clockwise direction beyond the position shown in Fig. 10, the aforesaid inclined surface 86a of the wheel 86 becomes disengaged from the lever section 77b whereupon the lever 77, by a snapping action, moves, under the influence of the spring 80, in a clockwise direction from the position shown in Fig. 10. As a result, the pinion 73 is rotated counter-clockwise, Fig. 10, and, by the clutch mechanism last described, said pinion 73 causes the serrated wheel 74 to move similarly in a counter-clockwise direction, Fig. 10, whereby a shower of sparks are produced and projected toward the wick at the lower end of the torch T which, meanwhile, has assumed the position shown in said Fig. 10.

The torch T may now be used for igniting a pipe, cigarette or for such other purpose as may be desired. As soon as said torch is removed from the actuating member 81, the latter rises under the influence of the spring 82 and all of the parts take a position such as illustrated in Fig. 10 wherein the mechanism is in condition for subsequent operation as desired.

While the invention has been described with respect to certain particular preferred examples which give satisfactory results, it will be understood by those skilled in the art after understanding the invention, that various changes and modifications may be made without departing from the spirit and scope of the invention and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel located in the path of sparks projected therefrom, said actuating member being biased toward one end of its path of movement, a manually operable torch engageable with said actuating member to move it along said path, and means whereby movement of said actuating member along said path transmits force directly to said sparking wheel to produce rotative movement thereof.

2. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel located in the path of sparks projected therefrom, and a connection between said actuating member and the sparking wheel whereby force is transmitted directly to said sparking wheel in response to movement of said actuating member by a torch.

3. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel located in the path of sparks projected therefrom, and a gear connection between said actuating member and the sparking wheel whereby force is transmitted, free from absorption or storage, directly to said sparking wheel in response to movement of said actuating member by a torch.

4. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel having a torch-engageable portion located in the path of sparks projected from said sparking wheel, means forming a pivot for said actuating member, said sparking wheel being located between said torch-engageable portion and said pivot, and a gear connection between said actuating member and the sparking wheel whereby force is transmitted directly to said sparking wheel in response to movement of said actuating member by a torch.

5. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on

said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel having a torch-engageable portion located in the path of sparks projected from said sparking wheel, means forming a pivot for said actuating member, said sparking wheel being located between said torch-engageable portion and said pivot, a gear connection between said actuating member and the sparking wheel whereby force is transmitted directly to said sparking wheel in response to movement of said actuating member by a torch, and a spring for biasing said torch-engageable portion to an upper position, said torch-engageable portion being movable along substantially a vertical path under the influence of said torch.

6. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel located in the path of sparks projected therefrom, a manually operable torch engageable with said actuating member to move it along its path of movement, and a connection between said actuating member and the sparking wheel whereby force is transmitted directly to said sparking wheel in response to movement of said actuating member by the torch, sparks being produced and projected toward said torch during movement of said actuating member throughout substantially the entire length of said path.

7. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel, said actuating member being biased toward one end of its path of movement, a manually operable torch means engageable with said actuating member to move it along its said path, said actuating member being located in a position on said receptacle such that said torch means while in engagement therewith may be positioned in the path of sparks from said sparking device, and means whereby movement of said actuating member along its path transmits force directly to said sparking wheel to produce rotative movement thereof.

8. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a movable actuating member for said sparking wheel having a depressible torch-engageable portion located adjacent the path of sparks projected from said sparking wheel, means forming a pivot for said actuating member, said sparking wheel being located between said torch-engageable portion and said pivot, said member extending downwardly from said portion into the receptacle and extending beneath said wheel within the receptacle and thence upwardly to said pivot, a gear connection between such upwardly extending part of said actuating member and the sparking wheel whereby force is transmitted directly to said sparking wheel in response to depression of said actuating member by a torch, and a spring for biasing said torch-engageable portion to an upper position.

9. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, whereby upon rotation of said wheel, sparks are projected to one side thereof, a manually operable torch means, a movable actuating member, means for pivotally supporting said member within said receptacle, upwardly extending means connected to one portion of said member and shaped to engage said torch means at a point adjacent the path of sparks projected from said wheel, another portion of said member extending upwardly from the pivotal support and operatively connected to said wheel, whereby depression of said first named upwardly extending means by said torch means transmits force directly to said wheel for rotating the same in a direction to cause a shower of sparks to impinge on the torch means, and spring means for restoring said actuating member to normal position upon removal of the torch means.

10. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, whereby upon rotation of said wheel, sparks are projected to one side thereof, a manually operable torch means, a movable actuating member, means for pivotally supporting said member within said receptacle, upwardly extending means connected to one portion of said member and shaped to engage said torch means at a point adjacent the path of sparks projected from said wheel, a tube in the receptacle for slidably receiving said upwardly extending means, another portion of said member extending upwardly from the pivotal support and operatively connected to said wheel, whereby depression of said first named upwardly extending means by said torch means transmits force directly to said wheel for rotating the same in a direction to cause a shower of sparks to impinge on the torch means, and spring means in said tube for restoring said actuating member to normal position upon removal of the torch means.

11. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a tubular member fixed in said receptacle, an actuating member for said sparking wheel reciprocatory in said tubular member, said actuating member being biased toward one end of its path of movement so as to locate the same in the path of sparks projected from said sparking wheel, a manually operable torch means engageable with said actuating member to move it along said path, and means whereby continuous rotative movement is imparted to said sparking wheel during movement of said actuating member throughout substantially the entire length of said path, the force of such wheel movement directly depending on the manual force applied by said torch means to said actuating member.

12. A pyrophoric lighter comprising a receptacle, a sparking device mounted in fixed position on said receptacle and comprising a sparking wheel and a pyrophoric element biased into engagement therewith, a tubular member fixed in said receptacle, an actuating member for said sparking wheel reciprocatory in said tubular member, said actuating member being biased toward one end of its path of movement so as to

locate the same in the path of sparks projected from said sparking wheel, a manually operable torch means engageable with said actuating member to move it along said path, and means whereby continuous rotative movement is imparted to said sparking wheel during movement of said actuating member throughout substantially the entire length of said path, the force of such wheel movement directly depending on the manual force applied by said torch means to said actuating member, said means comprising a lever arm, and said actuating member having a pin-and-slot connection with said lever arm.

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