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1,041,795.

Patented Oct. 22, 1912.

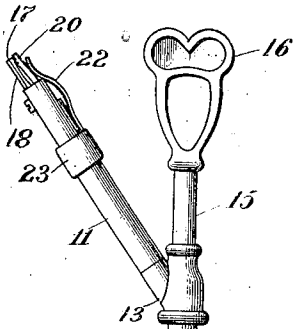


Fig. 1.

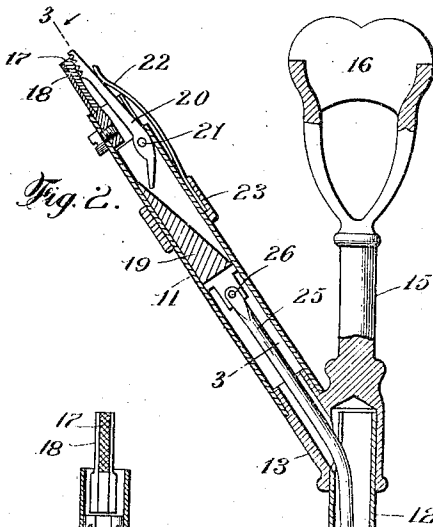


Fig. 2.

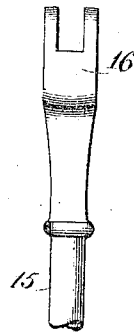


Fig. 1.

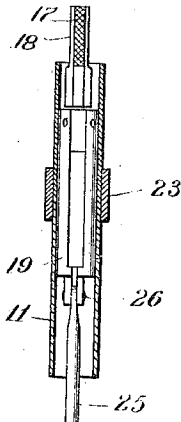


Fig. 3.

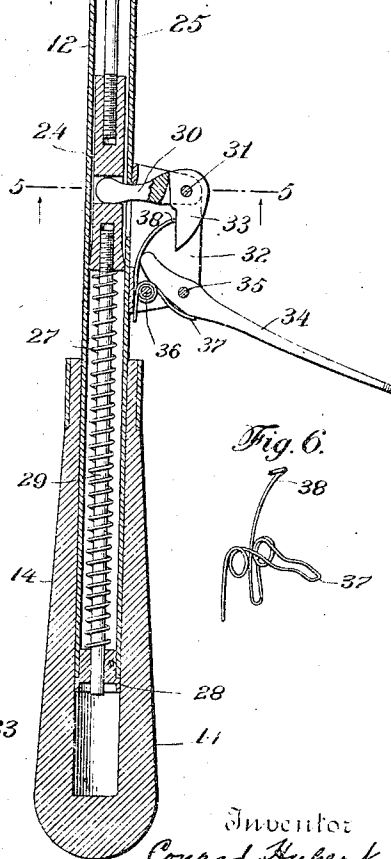


Fig. 6:

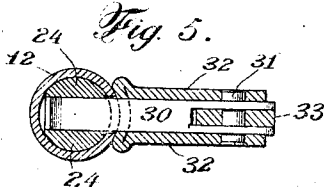


Fig. 5.

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UNITED STATES PATENT OFFICE.

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GAS-LIGHTER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CONRAD HUBERT, a citizen of the United States of America, residing at borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Gas-Lighters, of which the following is a specification, reference being had therein to the accompanying drawings, forming part thereof.

My invention relates to ignition devices of that type employing frictional sparking devices and relates more particularly to gas lighters.

My invention is adapted to employ a sparking material known as a pyrophoric alloy, which when subjected to friction by a hard metallic substance, such as steel, will freely produce sparks capable of effecting ignition. Such pyrophoric alloys are now known to the art and may constitute an alloy of some one or more of the rare earth metals, for example, an alloy containing cerium and iron has been found suitable for the purpose. However, it should be understood that my present invention is not directly concerned with the nature or composition of the pyrophoric alloy employed, but has to do with an ignition device adapted to employ such sparking material or pyrophoric alloy.

My invention has for its objects simplicity of construction, inexpensiveness of manufacture, durability and efficiency, and comprises several features of construction, including two slides arranged to reciprocate at an angle one to the other and connected together for concurrent movement, movement being imparted to one of the slides and the frictional sparking devices being actuated by the other of the slides.

My invention also includes a friction member pivoted on one of the slides and pressed into frictional sparking engagement with the sparking element by a spring mounted on the guide for the slide.

My invention also includes an automatic trigger mechanism operating to retract and release the sparking device while the trigger is being pressed.

My invention also includes several details

of construction and combinations of parts, as will hereinafter appear.

I shall now describe my invention with reference to the accompanying drawings and shall thereafter point out my invention in claims.

Figure 1 is an elevation of the complete device on a reduced scale. Fig. 2 is a partial central vertical section, with a part of the longitudinal tube broken away. Fig. 3 is a longitudinal section of the upper part of the igniting arm on a plane indicated by the line 3—3 of Fig. 2. Fig. 4 is an elevation of a portion of the upper part of the device as viewed from one side of Fig. 2. Fig. 5 is an enlarged transverse section on a plane indicated by the line 5—5 of Fig. 2, looking upward. Fig. 6 is a detail in perspective of the trigger spring.

In the embodiment of my invention illustrated in the drawings, two guide tubes 11 and 12 are joined together at an oblique angle by a connecting piece 13. The tube 12 is considerably longer than the tube 11 and at its lower free end carries a handle 14. The sparking devices are located at the upper free end of the shorter tube 11, which forms the igniting arm of the device. The connecting piece 13 is prolonged in alignment with the longer tube 12 to form a shank 15 terminating in a gas cock turner 16 of usual construction, as shown in the drawings. The sparking devices carried at the upper free end of the shorter tube 11 comprise a sparking element 17 composed of easily sparking material, such as above described, shown as supported and strengthened by a backing strip 18 of any suitable metal, the backing strip or support 18 being shown as removably secured by a screw within the end of the guide tube 11, such support and sparking element projecting from the end of such tube. Within the shorter tube 11, adjacent to its free end, is a slide 19, which is vertically slotted at its outer end and carries pivoted in the slot a pawl-like arm 20 on a pivot pin 21. The arm 20 is provided with teeth forming a roughened surface at its outer free end on the lower side adapted to frictionally engage the sparking element 17 when the slide

19 is moved in the guide tube 11. The teeth of the friction element 20 are inclined outwardly toward the free end of such element so as to more firmly engage the sparking element 17 by the outward movement of such friction element and to offer a minimum of friction to the retraction of the friction element. This effect is enhanced by retracting the slide 19 with a comparatively slow movement and advancing it by pushing it outward by a comparatively quick movement to produce sparking. Also greater friction on the outward stroke of the friction element is produced by reason of the fact that the pivoted arm 20 forming the friction element, extends from its pivot 21 to its point of engagement with the sparking element 17 at a downward angle to the guide tube 11, guiding the slide 19, the tendency being, as may be seen by the drawings (Fig. 2), to push the roughened friction surface into firmer contact with the sparking element 17. The friction element 20 is maintained in frictional sparking engagement with the sparking element 17 by a stiff flat spring 22 shown as secured at one end to the outside of the tube 11 by a band 23 and which at its outer end presses against the smooth back surface of the free end of the friction lever 20.

If the slide 19 be drawn inward from the position shown in Fig. 2 and then rapidly moved outward, no sparks will be produced by the inward movement but a shower of sparks will be thrown off from the sparking element 17 during the outward movement. Mechanism is provided for imparting such movements to the slide 19, this mechanism being conveniently operatable by the same hand that grasps the handle 14. A second slide or lower slide 24 is located in the longer guide tube 12 adjacent to the handle 14 and is connected with the upper slide 19 by a slightly flexible bent rod 25 shown as screwed into the slide 24 and as pivoted at its upper end to the lower end of the slide 19 by a pivot pin 26 passing through a slotted reduced end portion of the slide 24 receiving the flattened end of the rod 25. Because of the length of the lower straight portion of the rod 25 within the longer tube 12 and the flexibility of this rod, there is no need for a pivotal connection of such rod with the lower slide 24. Because of the fact that the rod 25 is bent at an obtuse angle and is of considerably smaller diameter than the internal diameter of the tubes 11 and 12, the rod 25 is permitted to reciprocate in the tubes without appreciable friction therewith.

A strong coil thrust spring 27 is adapted to quickly move the slide 24 upward and thereby produce frictional sparking engage-

ment between the friction element 20 and the sparking element 17. The thrust spring 27 abuts at its upper end against the lower end of the lower slide 24 and at its lower end against an abutment plug 28 fixed in the lower end of the longer tube 12, and is coiled about a guiding rod or steadying rod 29, shown as screwed at its upper end into the lower end of the lower slide 24 and guided at its lower end in a central hole in the abutment plug 28. The spring 27 should preferably be under some initial tension to assure that it will impart a strong sparking movement to the friction element 20.

Trigger mechanism is provided for drawing downward and automatically releasing the slide 24, thereby compressing and releasing the spring 27. Such mechanism comprises a toe 30 pivoted by a pivot pin 31 in a bracket 32 secured to the tube 12 adjacent to the handle 14. The toe 30 passes through a slot in the side of the tube 12 and has a rounded end engaging in an opening in the slide 24, as shown in Fig. 2. The upper edge of the slot in the tube 12 and a cross-piece on the bracket 32 serve as a stop for the toe 30 and thereby limit the outward movement of the slide 24 and limit also the expansion of the spring 27. The outer pivoted end of the toe 30 is bifurcated and between the prongs of the bifurcated portion a pawl 33 is pivoted on the same pivot pin 31 as the toe 30 and extends downward within the sides of the bracket 32, the pawl 33 having a pivotal lost motion engagement with the toe 30, as indicated in Fig. 2. A trigger 34 is pivoted in the bracket 32 on a pivot pin 35 and has a short lever end adapted to engage the depending end of the pawl 33, which lies in its path, and has a longer end forming a thumb piece. The trigger 34 is reset to a position with the thumb portion away from the handle 14 and the pawl 33 is moved into the path of said trigger by a spring coiled about a pin 36 in the bracket 32, such spring having a looped extended portion 27 engaging the trigger 34 and a shorter looped extended portion and an end engaging the base of the bracket 32 and another extended portion 38 engaging the pawl 33, (Figs. 2 and 6).

In operation, the thumb piece of the trigger 34 is depressed toward the handle 14 and the inner end of the trigger will engage the pawl 33 and actuate the toe 30 to retract the slide 24 and compress the thrust spring 27, the friction element 20 being also retracted by the slide 19 and actuating rod 25. When the trigger 34 has been sufficiently depressed, its shorter inner end will slip past the end of the pawl 33 and thereby release the thrust spring 27, which, by reason of the connections already explained, will move

the friction arm 20 quickly outward over the surface of the sparking element 17, against which it is pressed into frictional engagement by the spring 22. A shower of sparks, which will readily ignite illuminating gas, will be projected outwardly.

It is obvious that various modifications may be made in the construction shown and above particularly described within the principle and scope of my invention.

I claim:

1. A gas lighter comprising a sparking element, a slide, a guide for the slide, a friction lever pivoted to the slide and having a free friction end engageable with the sparking element, and a spring mounted on the guide and engaging the lever to press the free end of the friction lever into frictional engagement with the sparking element.

2. A gas lighter comprising a sparking element, a friction element, a slide supporting one of said elements, a guide for the slide supporting the other of said elements, the friction element comprising a pivoted lever having a free friction and engageable with the sparking element, and a spring adapted to rotate the friction lever on its pivot so as to press the free end thereof into frictional engagement with the sparking element.

3. A gas lighter comprising a sparking element, a slide, a guide for the slide supporting the sparking element, a friction element movably supported on the slide, a spring pressing the friction element into engagement with the sparking element, another guide at an angle to the first, another slide guided by the second guide, connecting means connecting the two slides, and means for actuating the second slide to thereby effect sparking engagement between the friction element and the sparking element.

4. A gas lighter comprising a sparking element, a slide, a guide for the slide supporting the sparking element, a friction element movably supported on the slide, a spring pressing the friction element into engagement with the sparking element, another guide at an angle to the first, another slide guided by the second guide, a bent actuating rod connecting the two slides, an actuating spring adapted to move the second slide in one direction, and a trigger mechanism adapted to move said second slide in the other direction of its movement and to automatically release the same, whereby the actuating spring will bring the friction element and the sparking element into frictional sparking engagement.

5. A gas lighter comprising a guide tube, a second guide tube joining the first at an

oblique angle, a slide in each guide tube, a bent rod of substantially smaller diameter than the inner diameter of the guide tubes connecting the two slides within the guide tubes, a sparking element, a friction element coactive therewith, one of said elements being supported by one of the guide tubes and the other of said elements being supported by the corresponding slide, and means for actuating the other slide.

6. A gas lighter comprising a guide tube, a second guide tube of greater length joining the first at an oblique angle, a slide in each guide tube, a bent rod rigidly connected to the slide in the longer guide tube and pivoted to the slide in the shorter guide tube, sparking devices adapted to be actuated by the slide in the shorter guide tube, and means for actuating the slide in the longer guide tube.

7. A gas lighter comprising a slide, a second slide, guides for the slides, a connection between the two slides, frictional sparking elements adapted to be brought into frictional sparking engagement by one of the slides, an actuating spring adapted to actuate the other slide, and a trigger mechanism adapted to effect tension and automatic release of the actuating spring by a single movement of the trigger.

8. A gas lighter comprising a movable part, sparking devices adapted to be actuated by such part, a spring for actuating such part, a pivoted toe engaging such part, a pawl pivoted concentrically with the toe and having a lost motion engagement therewith, a pivoted trigger engageable with the pawl, and resilient means for returning the trigger and the pawl to their normal positions.

9. A gas lighter comprising sparking devices, a slide, connections between the slide and the sparking devices for actuating the former, a spring for actuating the slide, and a combined retractive and releasing mechanism for the spring, such mechanism comprising a pivoted toe engaging the slide, a pawl adapted to actuate the toe, and a trigger coactive with the pawl.

10. A gas lighter comprising a slide, sparking devices adapted to be actuated by the slide, a spring for actuating the slide, a pivoted toe engaging the slide, a pivot pin for the toe, a pawl mounted on the same pivot pin as the toe and having a lost motion engagement with the toe, a pivoted trigger engageable with the pawl, a pivot pin for the trigger, and resilient means for returning the trigger and the pawl to their normal positions.

11. A gas lighter comprising sparking devices, a spring adapted to actuate the sparking devices, and a self-acting trigger

mechanism adapted to effect tension and automatic release of the actuating spring by a single movement of the trigger, such mechanism comprising a pivoted toe, a pawl pivotally mounted concentric with the toe and having a lost motion engagement therewith, and a trigger coactive with the pawl.

In testimony whereof I affix my signature in presence of two witnesses.

CONRAD HUBERT.

Witnesses:

WM. ASHLEY KELLY,
BERNARD COWEN.