April 15 , 1924. 1,490,562

A. L. HANSEN

IGNITER FOR ACETYLENE LAMPS

Filed July 22, 1920

Fig. 1

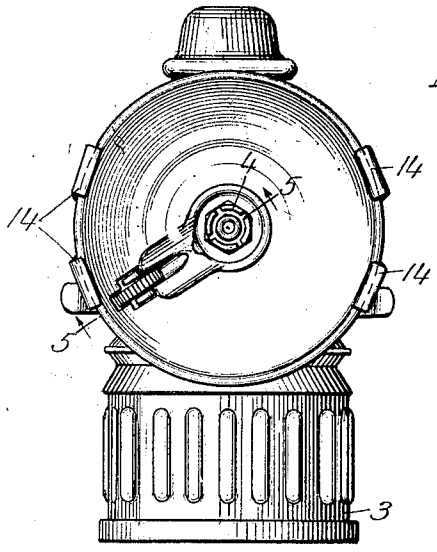


Fig. 2.

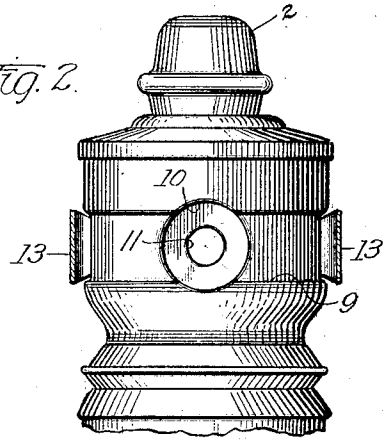


Fig. 3.

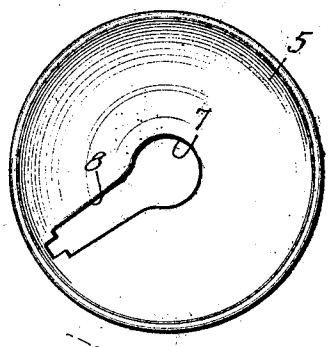


Fig. 4.

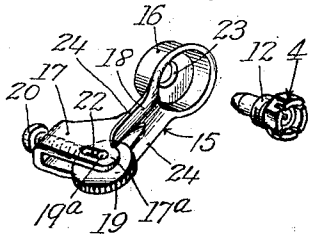
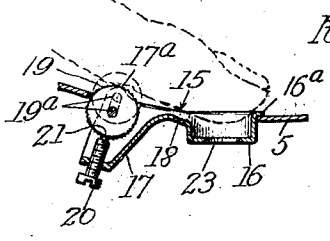


Fig. 5.



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Attys.

Patented Apr. 15, 1924. 1,490,562

UNITED STATES PATENT OFFICE.

AUGIE L. HANSEN, OF EVANSTON, ILLINOIS, ASSIGNOR TO A. L. HANSEN MFG. CO., OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

IGNITER FOR ACETYLENE LAMPS.

Application filed July 22, 1920. Serial No. 398,181.

To all whom it may concern:

Be it known that I, AUGIE L. HANSEN, a citizen of the United States, and a resident of Evanston, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Igniters for Acetylene Lamps, of which the following is a specification.

This invention relates to improvements in igniting devices, and more particularly to devices of the character described adapted for lighting small portable acetylene lamps such as miners' lamps and the like, and employing an improved adaption of the rotative friction wheel and pyrophoric element or sparking material.

Among the objects of the invention is to provide a new and novel arrangement of parts constituting an ignition device departing from that ordinarily employed whereby a superior functioning of the device is procured. Heretofore the ignition devices of the particular type to which this invention pertains, included a rotative thumb and friction wheel mounted adjacent the point of ignition, and a pyrophoric element constantly and yieldably held in contact with the wheel by means of a spring or other tension means. Experience has revealed the fact that these devices are open to objections, which will hereinafter be pointed out in the description of my improved device.

A further object of the invention is to provide a novel method of applying an ignition device to a lamp whereby the ignition may be accomplished more readily and with greater ease and certainty.

A preferable embodiment of the invention is hereinafter described in detail and illustrated in the accompanying drawings, in which—

Figure 1 is a view in front elevation of an acetylene lamp equipped with the ignition device of the invention,

Figure 2 is a view in front elevation of the lamp partially dissembled showing the reflector, ignition device and burner removed,

Figure 3 is a view in front elevation of the reflector showing the central opening and radial slot for receiving the ignition device and burner tip,

Figure 4 is a perspective view of the ignition device showing the connected igniter frame and the burner enclosing socket, and

Figure 5 is a cross-sectional view of the ignition device taken on line 5—5 of Figure 1.

The lamp to which the ignition device is applied is herein illustrated as one of the small open-faced reflector type; that is especially suited as a miner's or sportsman's lamp, and consists of a body 1 enclosing a water receptacle provided at its top with a filler opening normally closed by a frictionally retained cap 2. Having screw threaded connection with the body 1 is a cylindric receptacle 3 for containing the carbide, as the gas producing substance is commercially known. As is well known in the art, the acetylene gas is generated by the chemical action of the carbide and the water which is fed in small quantities to the mass of carbide in the receptacle. The gas thus generated is conducted through a passage communicating with a burner 4 having a small central orifice through which the gas issues. Surrounding the burner, which projects laterally from the body of the lamp is a concave reflector 5 preferably of brass or other suitable metal which may be polished to provide a bright reflecting surface. In this particular type of lamp a lens is omitted.

As clearly illustrated in Figure 3, the reflector 5 is provided with a central annular opening 7 from which radiates a slot 8 slightly less in width than the diameter of the opening 7 and terminating short of the periphery of the reflector. Extending around the lamp body is a shallow groove 9, Figure 2, and at a point in its circumference is formed an annular depression or recess 10 slightly deeper than the groove, and slightly greater in diameter than the width of said groove. An aperture 11 is provided at the center of the depression, this aperture having internal screw threads which engage external threads 12 formed on the burner 4, immediately behind the tip thereof (Figure 4). The reflector is centered with respect to the depression 10; that is, the marginal portion of the opening 7 of said reflector bears against the edge of the depression, these parts being aligned in concentric relation. The reflector is secured in place by the burner and a part of the igniting device hereinafter to be described, and also by means of

a metal strap 13 that extends around the lamp body and lies within the groove 9, flush with the lamp body surface. The ends of the strap terminate in forked arms 14—14 bent inwardly at their ends to form clips which engage the edge of the reflector.

Considering now the igniting device and the manner in which it is incorporated in the lamp, the same comprises in general a frame 15 which consists of an annual socket or cup member 16, a bifurcated bracket 17 and a connecting neck portion 18, these parts being preferably joined together to form a single or integral unit. The bracket 17 supports the spark producing elements, comprising a small metal friction disc or thumb wheel 19 having a roughened or serrated peripheral surface, and a screw 20 having at the end thereof a quantity of pyrophoric substance or sparking material 21 (Figure 5). The bracket 17 consists of a slotted member open along the outer side thereof and extending transversely to the neck portion 18, the opposite or inner side being closed and inclined or tapered toward said neck portion so as to provide a partially closed chamber having an entrance directed toward the cup member 16. The friction wheel is provided with short journals 19ª—19ª, which are engaged in bearing slots 22—22 formed in the walls of the brackets 17, said slots extending longitudinally adjacent the outer and open edge thereof, and substantially at right angles to the neck portion 18. The wheel 19 thus mounted in the slots 22—22 is freely rotative and capable of free bodily movement within the slots and in a direction such that it is free to move into and out of contact with the pyrophoric substance 21 at the end of the screw 20, the latter extending through the lower connecting wall of the hanger, its axis being substantially in alignment with the bearing slots 22—22 of the wheel 19. The screw is manifestly adjustable longitudinally in order to advance the sparking material into the path of the wheel as the same is gradually worn down.

The cup member 16 is an annular metal member of a diameter and depth such that it will fit snugly within the depression 10 of the lamp body, there being provided an opening 23 in its bottom wall adapted to register with the opening 11 with said depression. The mouth of the cup member is surrounded by a marginal flange 16ª, which merges with the neck portion 18 in the form of laterally projecting flanges 24—24, which extend throughout the neck portion, overlap the adjacent portion of the hanger 17 and terminate on either side of the wheel 19. As clearly shown in Figures 4 and 5, the surface of the neck portion 18 is concave transversely and provides a shallow groove or passage extending from the edge of the cup member to the wheel 19, and including the entrance to the chamber of the bracket 17, which approaches in close proximity to the cup member by reason of the inclined or tapered conformation of the chamber forming slot beyond the wheel 19, and in the direction of the cup member. It is to be further observed that an imaginary line passing through the axis of the wheel and parallel with the slots 22—22 is inclined with respect to an imaginary line coinciding with the central axis of the cup member, which in reality is the axis of the burner when the lamp parts are assembled. As a result of this arrangement, the device is shaped to conform more nearly with the curvature of the reflector surface, and to further increase the proximity of the ignition elements to the point of ignition.

As heretofore suggested, the reflector is centrally located over the depression 10 in the assembling of the parts, whereupon the cup member 16 of the ignition unit is inserted through the central opening 7 of the reflector, and into the depression 10 of the lamp body, the remaining parts of the ignition device passing through the slot 8 in the reflector with the flanges 24—24 engaging the reflecting surface, and substantially flush therewith, whereas the major portion of the bracket 17 and wheel 19 are positioned behind the reflector, although the upper extremities of the bracket in the form of ears 17ª—17ª, and a portion of the wheel 19 project above the reflector surface as shown in Figure 5. The ignition device is securely anchored in place by inserting and screwing in the burner 4, which passes through the central opening 23 in the bottom of the cup member, the tip of the burner bearing firmly around the edge of said opening.

It is important to observe the relation between the annular recess or cavity surrounding the burner 4, the chamber surrounding the wheel 19, and the grooved passage formed in the neck portion 18, inasmuch as the principle involved in the igniting process is dependent to a large degree upon the conformation of these parts.

The method of igniting the lamp, and the manner in which the parts function will be understood from the following; it being assumed that the gas is allowed to escape from the burner. A person places his thumb or forefinger (whichever is the more convenient) so that the fleshy part at the end of the finger rests upon and covers the opening of the cup member, a slight pressure of the finger being sufficient to form a seal around the edge of the cup. The finger thus placed and extended in alignment with the ignition device, engages the edge of the friction wheel 19 just beyond the first joint of the finger, as shown in dotted lines in Figure 5.

Having placed the finger as described, the ignition is completed by drawing the finger quickly away from the burner and over the wheel 19. The movement although deliberate, is yet a simple and natural one, wherein a number of concurrent functions are effected. In the initial position of the finger whereby the cavity surrounding the burner is sealed, causes a quantity of the combustible gas to be trapped or accumulated within the said cavity during the momentary placing of the finger in the prescribed position. In this position it is to be observed that the conformation and position of the finger is such that little or no pressure is exerted upon the wheel 19, which would tend to force it against the sparking element with sufficient pressure to generate the sparks. Now, if the finger tip is quickly drawn away from the cup and toward the wheel, a quantity of the escaping gas from the cavity is carried ahead of the finger (which engages the grooved passage) and is directed or forced into the open entrance of the chamber surrounding the wheel 19. As the finger recedes from the cup member 16, its contact with the wheel 19 is sufficient to rotate the same, although not with sufficient pressure to frictionally engage the sparking material and generate sparks. In other words, an initial rotation is imparted to the wheel, but without effect so far as the production of sparks is concerned. However, as the tip of the finger passes over the wheel, a pronounced pressure is applied which forces the wheel against the sparking element, and the sparks are produced, these being thrown upwardly and tangentially to the wheel toward the opening, into which the gas is just being introduced by the movement of the finger. This intermingling of the sparks with the combustible gas, coupled with the throwing of the sparks toward and in close proximity to the escaping gas, is calculated to ignite the burner without frequent repetitions of the igniting operation, the positiveness of the ignition being promoted by the entrance of the combustible gas within the space separating the burner tip and the point of generation of the igniting sparks.

Attention is again directed to the manner in which the friction wheel is mounted, it being first noted that the inclination of the slots 22—22 to the axis of the burner is such that the bodily movement of the wheel is at right angles to the curved surface of the reflector or tangential to the surface of the finger in passing simultaneously over the wheel. Furthermore, it is to be noted that the wheel is freely movable in and out of contact with the pyrophoric substance; thus when the finger is first moved rearwardly, the wheel is practically out of contact with the pyrophoric substance, and therefore free to rotate. In other words, an initial rotation is imparted to the wheel so that by the time the tip of the finger comes into contact with the wheel, it has reached such a speed that the momentary increase in pressure impressed upon the wheel at the instant the finger leaves it is sufficient to produce an intense and abundant shower of sparks, when the conditions of ignition are the most favorable. Although the duration of the spark generation is not co-extensive with the rotation of the wheel, it is much to be preferred in that the sparks are produced at the instant the proper conditions of ignition have been established; namely, when a train of gas has been formed between the burner and the source of ignition. Furthermore, the use of a freely rotative element avoids excessive wearing away of the pyrophoric substance, and the annoyances that invariably attend the operation of the ordinary spring pressed sparking element, due to the difficulty in rotating the wheel against the constant and often excessive pressure exerted upon it and opposing its movement. Hence the arrangement herein disclosed eliminates the uncertainty of ignition, the abrasive effect on the thumb or finger due to repeated attempts to ignite the lamp, increases the life of the sparking element, and in short, provides a more efficient and dependable ignition device.

I claim as my invention:

1. A gas lamp comprising a body carrying a reflector, a burner extending through the reflector and mounted within a depression, an ignition device projecting through the reflector adjacent said burner, and a radially extending groove extending from said depression to said ignition device and adapted to be momentarily sealed in the actuation of said ignition device.

2. A gas lamp comprising a body, a reflector, a burner located centrally of said reflector and having a depression surrounding the same, an ignition device mounted adjacent said burner and having an operating member projecting and opening in said reflector and a groove substantially flush with the surface of said reflector and extending from said depression to said operating member, and adapted to be momentarily sealed by the finger of the operator in actuating the ignition device.

3. A gas lamp comprising a body carrying a reflector, a burner extending therethrough and mounted within a depression, an ignition device carrying an operating member extending through the reflector and having a portion substantially flush with the top surface of the latter, and a trough extending from said portion to said depression, the depression and the top of said trough being adapted to be closed by the finger of the operator in the act of actuating

said operating member, substantially as and for the purposes set forth.

4. A gas lamp comprising a body carrying a reflector, a burner extending therethrough, a cup-shaped receptacle surrounding said burner, an igniting device mounted outside of said reflector and provided with an operating member having a portion extending through the reflector and positioned substantially flush with the outer surface thereof, and a three-walled passage extending from said receptacle towards said operating member, substantially as described.

5. A gas lamp comprising a body, a reflector mounted on said body, a burner located centrally of said reflector, and substantially flush with the surface thereof, a friction wheel and sparking element located adjacent said burner, the top periphery of said wheel being substantially flush with the reflector surface and rotative in the act of drawing the finger tip from the burner along the reflector surface toward said wheel.

6. A gas lamp comprising a lamp body, a reflector mounted in said body, a burner for the generated gases located centrally of said reflector, an ignition device comprising a friction wheel and a sparking element mounted adjacent said burner, with the top periphery of said wheel substantially flush with the reflector surface, and a groove extending from the burner to a point adjacent said wheel.

7. A gas lamp comprising a lamp body, a reflector mounted in said lamp body, a burner mounted within a cavity centrally located with respect to said reflector and an ignition device mounted adjacent said cavity and comprising a friction wheel and a sparking element, a supporting bracket therefor mounted behind said reflector and forming a chamber opening toward said burner, and a groove extending from said cavity to said wheel, said wheel and groove being substantially flush with the surface of the reflector.

8. A gas lamp comprising a lamp body, a reflector mounted on said lamp body, a burner centrally located with respect to said reflector, there being provided a cavity surrounding said burner adapted to be sealed by the tip of a finger, an ignition device comprising a bracket mounted behind the surface of the reflector and forming a chamber opening flush therewith and directed toward said cavity, a friction wheel and a sparking element mounted in said bracket, there being a groove extending from the opening of said bracket toward said cavity substantially flush with the reflector surface.

9. In combination with a gas burner, an igniting device therefor, comprising a fixed sparking element and a rotative actuating wheel for said element, said wheel being mounted for free but limited movement longitudinally of said element, substantially as described.

10. In an ignition device, the combination of a supporting member, a friction wheel mounted in said supporting member and capable of free but limited bodily movement relative thereto, and a normally fixed sparking element mounted substantially in longitudinal alinement to the path of bodily movement of said wheel.

11. In an ignition device, the combination of a stationary sparking element, a supporting bracket for said element provided with bearing slots, a rotative friction wheel journaled in said slots and adapted for free but limited movement therein longitudinally towards and away from said element, whereby said wheel, in one position of its movement, may engage said element, substantially as described.

12. In an ignition device, the combination of a sparking element, a friction wheel, and a support for said wheel provided with elongated bearing slots extending longitudinally in axial alignment with said sparking element.

13. In an ignition device, the combination of a normally fixed sparking element, a thumb and finger friction wheel, and means for rotatively supporting said wheel and permitting its free bodily movement into and out of contact with said sparking element and directly parallel with the axis thereof.

14. An ignition device comprising a rotative element and a fixed co-operating element, said elements being adapted to produce sparks when brought into frictional contact each to each, said rotative element being mounted for limited free movement towards and longitudinally of the fixed element, substantially as described.

15. An ignition device comprising a rotative element and a normally fixed element adapted to produce sparks when said rotative element is rotated in frictional contact with said fixed element, and a support for said rotative element permitting a free but limited bodily movement of said rotative element into and out of frictional contact with said fixed element.

In witness whereof, I hereunto subscribe my name this 19th day of July, A. D. 1920.

AUGIE L. HANSEN.