UNITED STATES PATENT OFFICE

2,485,391

ROADSIDE WEED BURNER

Arthur S. Lasseigne and Etienne J. Lasseigne, Reserve, La.

Application March 17, 1947, Serial No. 735,116

9 Claims. (Cl. 126—27.2)

1 This invention relates to weed burners and, more particularly, to a device for burning weeds along the sides of roadways and adapted to employ a liquified gas as a fuel.

2 In road maintenance it is customary to keep down the weeds, bushes, grass and the like, that grow alongside the roads to provide the traveler with a clear vision of the shoulders and ditches bordering the road. This weed control is generally effected by cutting the weeds with a mower which cuts the weeds in a plane and creates the undesirable allusion that the ground thereunder is level. In order to overcome this difficulty, the weeds must be cut out of the ditches and on banks by hand, as with scythes or the like, and this involves considerable labor and manpower.

3 To overcome the above stated difficulties, it has been proposed to remove the weeds by burning with flame throwers so that the weeds would be burned to the ground and the contour of the roadside would be clearly visible. The devices that have been proposed for this purpose have not been entirely satisfactory, however, on several counts. It has been the universal practice to employ an oil for the fuel and this requires a large, cumbersome and expensive apparatus. Furthermore, the flame produced by the oil is "soft" as distinguished from a blast flame and does not penetrate thick, matted vegetation but merely sears the top thereof and does not create sufficient heat, except within the flame, to burn moist, green vegetation. In addition, the burners or flame throwers have not had sufficient versatility of movement to permit their proper adjustment to accommodate specific roadside conditions, or, if adjustable mounted, have been so complicated from a mechanical standpoint that they are unduly expensive and difficult to regulate.

4 Having in mind the defects of the prior art apparatus, it is an object of this invention to provide a burner or flame thrower, for use in cleaning road sides, that is adapted to employ a liquified gas as fuel and is provided with a burner that is capable of projecting a blast flame that is capable of creating a high degree of heat and will penetrate thick and matted vegetation and effectively consume moist, green vegetation. It is an additional object of the invention to mount the burner so that it may readily and easily be adjusted laterally and angularly with respect to the ground. It is a further object of the invention to provide a structure for adjustably supporting the burner that may also be employed as a gas pressure chamber for supplying vapor-ized gas to the burner mounted thereon. It is still another object of the invention to provide a device of this character that may be unitarily mounted upon a sulky adapted as a trailer which may be hitched onto any suitable traction unit.

5 The foregoing objects and others ancillary thereto are preferably accomplished, in accordance with a preferred embodiment of the invention, by a blast flame burner adapted to employ a vaporized gas, which burner is slidably mounted upon an elongated frame that is pivotally supported by a suitable carriage upon which it is mounted. The frame is a supply tank adapted to contain liquified gas. The tank is provided with a pressure regulator which is connected with a vaporizer for vaporizing the liquified gas and supplying it to the burner mounted on the frame. The frame is composed of a pair of elongated side members, one of which is hollow and is connected with the vaporizer to function as a pressure chamber and to supply the vaporized gas to the burner unit. The burner is provided with a suitable nozzle for directing the blast flame toward the ground, and suitable controls are provided for effecting the sliding adjustment of the burner unit and the pivotal adjustment of the burner-supporting frame, springs being provided to counterbalance the weight of the frame. Although the apparatus may be mounted upon any type of carriage, it is preferred that it be mounted upon a sulky or trailer that may be hitched behind any suitable mobile power unit, such as a tractor or truck.

6 The novel features that are considered characteristic of the invention are set forth with particularity in the appended claims. The invention itself, however, both as to its organization and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of a specific embodiment when read in connection with the accompanying drawings, wherein like reference characters indicate like parts throughout, and in which:

7 Fig. 1 is a view in perspective of a roadside weed burner comprising the preferred embodiment of the present invention;

8 Fig. 2 is a top plan view of the structure shown in Fig. 1;

9 Fig. 3 is a fragmentary cross-sectional view taken approximately on line 2—2 of Fig. 2;

10 Fig. 4 is a fragmentary cross-sectional view taken approximately on line 4—4 of Fig. 2;

11 Fig. 5 is a fragmentary cross-sectional view taken approximately on line 5—5 of Fig. 2; and
2,485,391 3

Fig. 6 is side view in elevation, on a reduced scale, of the structure shown in Fig. 1. Referring specifically to Fig. 1, the present invention comprises a burner 10 provided with a flame-directing nozzle 11 and which is suspended by a sleeve hanger 12 from an elongated frame 13 that is pivotally mounted on a mobile support 14. The frame 13 that is mounted on one side and adjacent end so that its other end portion extends laterally of the support 14 and the burner 10 is slidably mounted on this free end. The burner 10 is preferably one of the so-called fan-mix type, such as shown in patent No. 2,177,245 to Edward L. Dennis. This type of burner is preferred as it is adapted to produce the desired blast type of flame with its high heat and to employ liquified gas as a fuel. The elongated frame 13 is composed of a pair of spaced round pipes 15 and 15' as they afford the greatest strength at minimum weight, and these pipes 15 and 15' are joined by cross members 16, 16b and 16c, which may be formed of channel iron, to create a rigid frame. The round pipes are preferred as the inner pipe 15' may then function as a shaft and be journaled in sleeves 17 mounted on the support 14, as best shown in Fig. 2, so that the frame 13 may be pivoted in the sleeves 17 relative to the support 14. In addition, the outer pipe 15 may be employed as a gas chamber or supply line for feeding the gas to the burner 10.

The cross members 16 and 16b, at the ends of the frame 13, seal the ends of the pipes 15 and 15' with the exception that the outer cross member 16b has a hole therethrough, in communication with the interior of the pipe 15, and a nozzle 20 is inserted at said hole and adapted to receive one end of a flexible hose 21 which may be connected at the other end with the burner 10. An intermediate cross member 16 is spaced from the inner end of the frame to limit lateral movement of the frame 13 in the sleeves 17. The hose 21 must be sufficiently long to accommodate lateral movement of the burner 10 on the frame 13 and, in order to prevent the hose 21 from dragging, it may be suspended centrally thereof by an elastic or slide hanger 22 suspended from an arm 23 that is mounted on the outer end of the frame 13.

A pipe 25 is provided on the inner end of the frame pipe 15 to receive one end of a flexible hose 26 that is connected with a vaporizing unit 27 which is mounted on a base 28 that straddles the pipes 15 and 15' of the frame 13. The flexible hose 26 must have sufficient length to accommodate the swinging movement of the vaporizer 27 during the pivotal movement of the frame 13.

The vaporizing unit 27 may be conventional in type and is connected by a flexible tube 29, having a control valve 30, with a pressure regulating unit 31 which is mounted on, and in communication with, a liquid gas tank 32 that is positioned on the mobile support 14. By this arrangement the liquid gas is supplied from the tank 32 at a pressure maintained by the regulator 31, past the valve 30 and through the tube 29 to the vaporizer 27 which vaporizes the gas and feeds it through the hose 26 into the pipe 15, which acts as a pressure chamber, and thence through the hose 21 through the burner 10.

It is desirable that the burner hood or nozzle 11 may be adjusted vertically or through an angle in accordance with the thickness, greenness or matting of the weed growth. To accomplish this action, as best shown in Fig. 3, the frame 13 is provided with an upstanding arm 35 that is connected by a link 36 with a hand lever 37 that is pivoted on a pin 38 carried by an upstanding frame 39 that is mounted on the support 14. The hand lever 37 is of a well-known type having a retractor tooth that is adapted to cooperate with a ratchet 40, which is also mounted upon the frame 39, for holding the lever 37 in the desired position. Thus, the operator riding on the support 14, may swing the hand lever 37 which pulls or pushes the link 36 and arm 35 to swing the frame 13 about the axis of the bearings 17 to adjust the spacing and angle of the hood or nozzle 11 of the burner 10 as shown in Fig. 4.

The weight of the frame 13 may be counterbalanced by springs 42 connected at one end to the outer pipe 15 and at the other to the top of the frame 39 and a corresponding frame 39' on the other side of the support 14.

As previously stated, the burner 10 is slidably suspended on the frame 13 by the hanger 12 and this arrangement is preferred so that the burner 10 may be moved laterally along the frame and with respect to the support 14. In order to accomplish this movement, the burner 10 is connected on each side with the ends of a cable 45 which over a sheave or pulley 46 mounted on the outer end of the frame 13 and has several turns wound around a drum 47 which is mounted astraddle the frame 13. As best shown in Fig. 5, the drum 47 is so mounted on a shaft 48 with a bevel gear 49, the shaft 48 being journaled in bearing members 50 which are mounted respectively on the pipes 15 and 15'. A vertical shaft 51 has a bevel pinion 52 mounted on its lower end and a hand wheel 53 mounted on its upper end. The vertical shaft 51 is journaled in an upstanding frame 54 that is mounted on the frame 13, the shaft 51 being so positioned that its bevel pinion 52 meshes with the bevel gear 49 on the drum shaft 48. Thus, an operator, riding on the support 14, may laterally adjust the burner 10 by turning the hand wheel 53 which, through the action of the bevel gears 49 and 52, rotates the drum 47 and winds the cable 55 thereon to pull the burner 10 along the frame 13 in accordance with the direction in which the hand wheel 53 is turned.

In order to provide the desired mobility, the support 14 is preferably in the form of a suky or cart, as best shown in Fig. 6, comprising a bed 55 mounted upon a single axle 56 that is supported by a pair of wheels 57 and provided with a draw bar 58 carrying a hitch 59 for connection with a suitable power traction unit. The bed 55 is so positioned on the axle 56 that the wheels 57 support approximately two-thirds of the weight of the unit whereas the connection between the hitch and the traction unit provides the desired balance of the unit while obtaining the maximum in flexibility of movement. A strut or stand 60 is pivotally connected to a bracket 51 at the outer end of the draw bar 58 to provide the third point of support when the hitch 59 is not connected with a tractor.

To operate the device the hitch 59 is coupled to a traction unit and the strut or stand 60 is pivoted upwardly at the position indicated in broken lines in Fig. 6. The gas control valve 30 may then be opened to start the flow of liquid gas from the tank 32, in accordance with the pressure established by the regulator 31, past the valve 30 and through the tube 29 to the vaporizer 27. In order to accommodate plant growth within a small inexpensive unit it is preferred to employ a liquified gas, such as propane gas, as the burning medium. Due to the properties
of such liquified gases, as propane, they will vaporize when their pressures are reduced, but in doing so, their temperature will rise, thus reducing the rate at which they vaporize.

In view of the foregoing condition, it has been found best, when drawing the liquified gas from the tank 22, to increase its rate of vaporization in order to obtain the vapor in sufficient quantity to supply the burner 18 for maximum operating efficiency. The increased rate of vaporization is obtained by directing the liquified gas into the vaporizer 27, which is of a standard type, wherein heat is supplied to the gas to insure its complete vaporization and yet be delivered at a temperature above that of normal atmosphere and with a minimum decrease in pressure. The vaporized gas, upon leaving the vaporizer 27, is directed into the gas chamber 19 by the flexible hose 21.

The burner 18 is preferably of the fan-mix type which is so designed as to provide the proper air mixture with the vaporized gas for complete combustion and to deliver a stream of gas mixture to the burner head or nozzle 11 with such velocity as to assure complete penetrations of the heat through a matting of green weeds, as well as permitting complete control of the heat for distribution. The rate of travel of the burner 18, or of the support 14, is regulated by the temperature of the hot gases which are delivered from the burner 18 and the matting and greenness of the weeds. The positioning of the burner 18 is likewise prescribed by these conditions.

In accordance with the spacing of the weeds from the road side, the burner 18 is adjusted along the frame 13, the supply hose 61 being of sufficient length to permit movement of the burner 18 the full length of the free end of the frame 13. This movement is accomplished by winding the cable 48, in one direction or the other, according to the desired directions of movement, on the drum 47 by means of the hand wheel 53. Likewise the frame 13, the supply hose 21 being of sufficient in accordance with the height of the weed growth and irregularity of the land. This movement is accomplished by pivoting the frame 13 in its sleeve bearings 17 by means of the hand lever 37 which is connected to the frame 13 by the link 36 and crank arm 35.

In view of the foregoing description it will be seen that the present invention contemplates a structure in which are eliminated all moving units that will wear through continuous operation, with the single exception of the burner supporting bearings 17 which may be encased in a body of oil. The burner 18 obtains its power for operation from the pressure developed by the gas itself, thus, no other source of power is necessary.

Although a certain specific embodiment of the invention has been shown and described, it is obvious that many modifications thereof are possible. The invention, therefore, is not to be restricted except by the spirit of the appended claims.

That which is claimed, as new, is:
1. An apparatus for burning weeds and the like, a wheeled vehicle support, an elongated frame pivotally mounted on said support along one of its sides adjacent one end of said frame so that its other end portion extends laterally beyond said support, manually operable means on said support and having an operative connection with said frame for adjusting pivotally said frame relative to said support and located for access by an operator on said support, a burner slidably mounted on the extended portion of said frame, and manually operable means for adjusting said burner along said extended frame portion and located for access by said operator on said support.

2. An apparatus for burning weeds and the like which comprises a mobile support, an elongated frame pivotally mounted on said support along side adjacent one end of said frame so that its other end portion extends beyond said support, one of the elongated side members of said frame being formed by a hollow member, means on said support for adjustably pivoting said frame relative thereto, a burner slidably mounted on the extended portion of said frame, means for sliding said burner along said extended frame portion, a fuel supply tank on said support, a fuel line between said fuel supply tank and said hollow frame member, and a fuel line between the outer extended end portion of said hollow frame member and said burner.

3. An apparatus for burning weeds and the like which comprises a mobile support, an elongated frame pivotally mounted on said support along one side adjacent one end on said frame so that its other end portion extends laterally beyond said support, one of the elongated side members of said frame being formed by a hollow member, means on said support for adjustably pivoting said frame relative thereto, a burner slidably mounted on the extended portion of said frame, means for sliding said burner along said extended frame portion, a fuel supply tank on said support, a vaporizer mounted on said frame adjacent said support, a flexible fuel line between said fuel supply tank and said vaporizer, a fuel line between said vaporizer and said hollow frame member, and a flexible fuel line between the outer extended end portion of said hollow frame member and said burner.

4. An apparatus for burning weeds and the like which comprises a mobile support, journals mounted on said support, an elongated rectangular frame including elongated side members formed by hollow round pipes, one of said side members being pivotally mounted in said journals and adjacent one end thereof so that the other end portion of the frame extends laterally beyond said support, means on said support for adjustably pivoting said frame relative thereto, a burner slidably mounted on the extended portion of said frame, means for sliding said burner along said extended frame portion, a fuel supply tank on said support, a vaporizer mounted on said frame adjacent said support, a fuel line between said fuel supply tank and said vaporizer, a fuel line between said vaporizer and one of said hollow frame members, and a fuel line between the outer extended end portion of said hollow side member and said burner.

5. An apparatus for burning weeds and the like which comprises a mobile support, journals mounted on the rear end of said support, an elongated rectangular frame including elongated side members formed by hollow round pipes, one of said side members being pivotally mounted in said journals, means on said support for adjustably pivoting said frame vertically relative to said support, a burner slidably mounted on said frame, means for sliding said burner along said frame,
a fuel supply tank on said support, a flexible fuel line between said fuel supply tank and one of said hollow side members, and a flexible fuel line between the outer extended end portion of said hollow side member and said burner.

6. An apparatus for burning weeds and the like which comprises a mobile support, journals mounted on said support, an elongated rectangular frame including elongated side members formed by hollow round pipes, one of said side members being pivotally mounted in said journals and adjacent one end thereof so that the other end portion of the frame extends laterally beyond said support, means on said support for adjustably pivoting said frame relative thereto, a burner slidably mounted on the extended portion of said frame and adapted to burn a fluid fuel, means for sliding said burner along said extended frame portion, a fuel supply tank adapted to contain liquefied fuel and being mounted on said support, a vaporizer adapted to vaporize the liquefied fuel and being mounted on said frame adjacent said support, a fuel line between said fuel supply tank and said vaporizer to permit its movement with said frame, a fuel line between said vaporizer and one of said hollow side members to supply vaporized gas to said hollow member which functions as a pressure chamber, and a fuel line between the outer extended end portion of said hollow side member and said burner.

7. An apparatus for burning weeds and the like and for attachment to a transportable support, said apparatus comprising an elongated frame, means for mounting the frame on the support in a horizontal position, a burner mounted on said frame for movement lengthwise of the frame, means projecting from the burner for directing the flame, and means for adjusting the burner along said frame and which includes a manually operated drum journaled on the frame at one end portion of the latter, and a sheave mounted at the other end portion of the frame, an endless cable attached to the burner and wound about said drum and passing over said sheave, and means for connecting said burner with the source of fuel supply.

8. A weed burner as set forth in claim 7 wherein the means mounting the frame on the support comprises brackets in which the frame is mounted for movement about a horizontal axis and means for angularly adjusting said frame about said horizontal axis.

9. An apparatus for burning weeds and the like, for attachment to a transportable support, said apparatus comprising a horizontal frame including a pair of spaced parallel members, a burner slidably mounted upon said parallel members, a manually operated drum journaled at one end portion of the frame, a sheave at the other end portion, an endless cable connected to said burner and passing over said sheave and being wound about said drum, brackets for mounting said frame on said support and in which one of said parallel members is rotatably mounted, and a connecting means between the burner and a source of fuel supply.

ARThUR S. LasseIGNE.
EtiennE J. lasseIGNE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>422,278</td>
<td>Archer</td>
<td>Feb. 25, 1890</td>
</tr>
<tr>
<td>457,702</td>
<td>Bruce</td>
<td>Aug. 11, 1891</td>
</tr>
<tr>
<td>526,300</td>
<td>Dawson et al.</td>
<td>Sept. 15, 1894</td>
</tr>
<tr>
<td>896,774</td>
<td>Tetzman</td>
<td>Aug. 25, 1903</td>
</tr>
<tr>
<td>919,328</td>
<td>Dubois</td>
<td>Apr. 27, 1909</td>
</tr>
<tr>
<td>1,433,885</td>
<td>Fuller</td>
<td>Oct. 31, 1922</td>
</tr>
<tr>
<td>1,600,340</td>
<td>Smith</td>
<td>July 8, 1924</td>
</tr>
<tr>
<td>1,823,975</td>
<td>Little</td>
<td>Jan. 20, 1925</td>
</tr>
<tr>
<td>1,890,838</td>
<td>Schults</td>
<td>Dec. 25, 1928</td>
</tr>
<tr>
<td>1,799,035</td>
<td>Benien et al.</td>
<td>Mar. 31, 1931</td>
</tr>
<tr>
<td>1,987,603</td>
<td>Claesson</td>
<td>Jan. 15, 1935</td>
</tr>
<tr>
<td>2,008,881</td>
<td>Woods</td>
<td>July 23, 1935</td>
</tr>
<tr>
<td>2,043,761</td>
<td>Marshall</td>
<td>June 9, 1936</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Germany</td>
<td>June 8, 1926</td>
</tr>
</tbody>
</table>