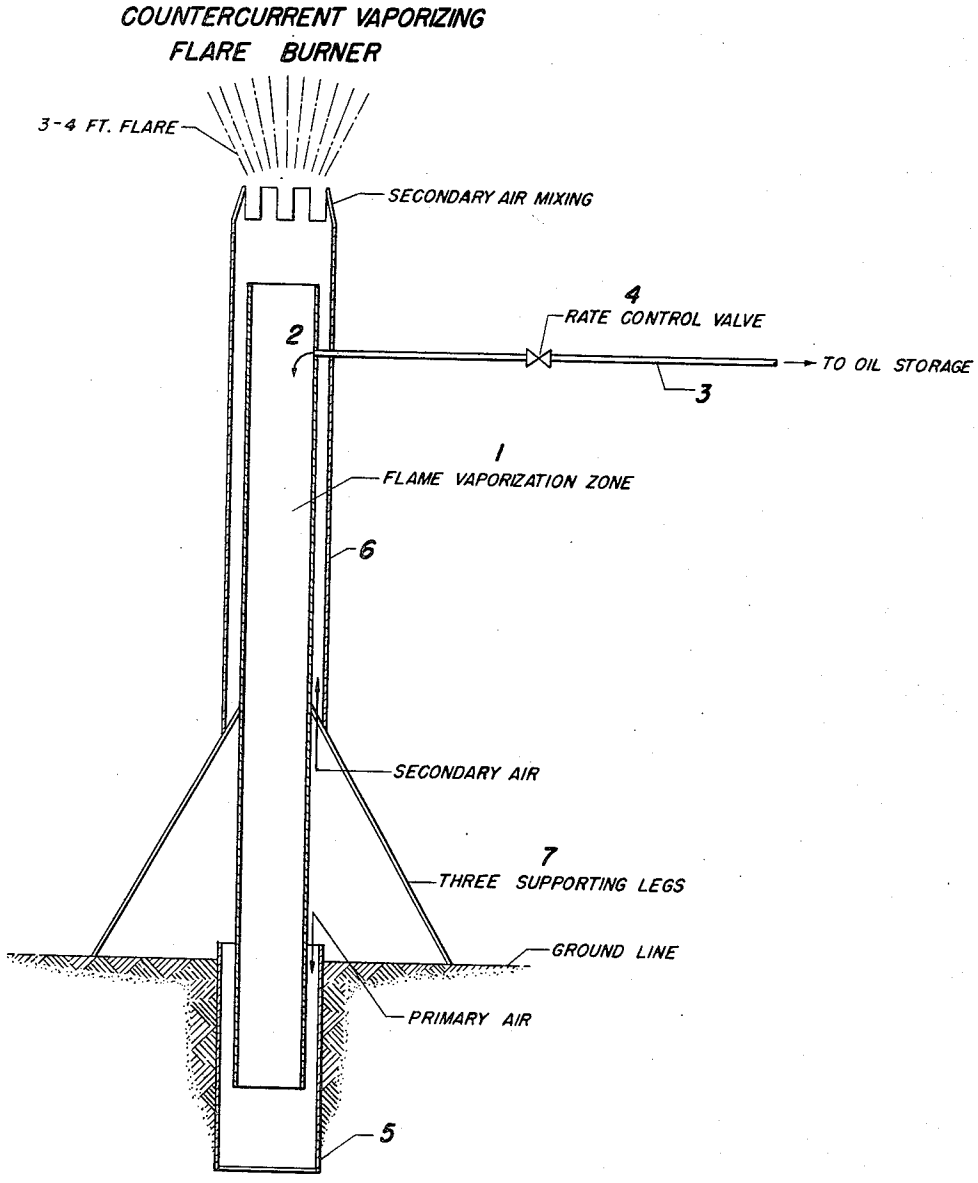
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COUNTERCURRENT VAPORIZING FLARE BURNER

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FIG. 1



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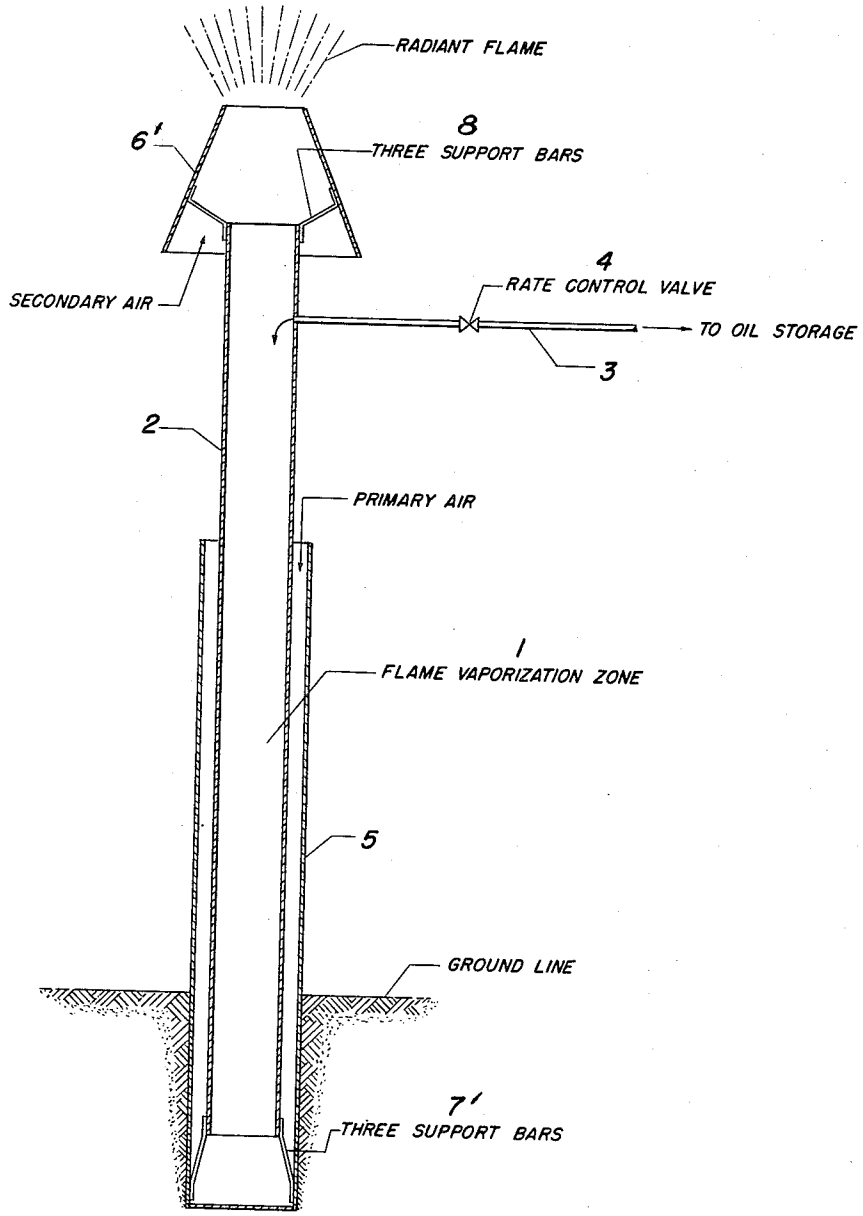
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FIG. 2



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COUNTERCURRENT VAPORIZING FLARE BURNER

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4 Claims. (Cl. 126—59.5)

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The present invention relates to liquid fuel burners and, more particularly, to a simple but effective burner suitable for protecting orchards, citrus groves and the like from low temperatures.

Figure 1 is a vertical section of one embodiment of the present invention; and Figure 2 is a vertical section of another embodiment of the present invention.

The novel burner vaporizes the heavy fuel, or light fuel if desired, in its own flame. The burner, as can be discerned by reference to Figure 1, comprises a vertical central pipe or combustion and vaporizing chamber 1 of sufficient length to insure vaporization and combustion of the fuel before the fuel reaches the lower end thereof. The fuel is introduced into the combustion and vaporizing chamber at a point 2 near the upper end of the combustion and vaporizing chamber. The rate of flow of the fuel in conduit 3 from the storage tank (not shown) is controlled by valve 4. The fuel is fed from the storage tank by gravity. The lower part of combustion and vaporizing chamber 1 is surrounded by substantially concentric cylinder 5 closed at the bottom. Primary air enters through the annulus formed between the outer surface of the lower portion of the combustion and vaporizing chamber and the inner surface of the aforesaid substantially concentric cylinder. The upper portion of the combustion and vaporizing chamber is surrounded by a substantially concentric cylinder 6 which extends beyond the upper end of the combustion and vaporizing chamber. The upper end of the aforesaid cylinder or sleeve 6 preferably is tapered to produce a Venturi effect and/or the upper edge can be scalloped or cut out in a manner similar to that illustrated in Figure 2 of the drawings. The annular space between the combustion and vaporizing chamber 1 and sleeve 6 provides a pasageway for secondary air which is admitted at the bottom of sleeve 6. The heater is also provided with supports such as legs 7.

For servicing orchards, vegetable farms and airport runways the novel burners may be used as individual units or connected in batteries. The most convenient way to assemble the novel burner is to prepare a substantially vertical pit in the ground of the area to be protected of such size as to be fitted snugly by cylinder 5. Combustion and vaporizing chamber 1 is then placed with the lower end thereof within and substantially concentric with cylinder 5. Supports or legs 7 are then adjusted to position the bottom of chamber 1 a few inches from the bottom of

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cylinder 5. Cylinder 6 is then placed substantially concentric with the upper portion of chamber 1 and supported by legs 7.

To start the burner, a trickle of oil is admitted through conduit 3 to combustion and vaporizing chamber 1 to flow down the inner surface of chamber 1. Flame is applied to the oil trickle on the inner surface of chamber 1. The area within which the oil enters chamber 1 heats quickly and the flow of oil to the combustion and vaporizing chamber can be increased up to the desired rate of feed. It is preferred that the oil be admitted to the combustion and vaporizing chamber at a rate no greater than it is consumed. When oil in relatively large amounts is unburned and flows unburned to the bottom of the combustion tube, the desirable, novel countercurrent effect is lost. When unburned oil collects in the bottom of sleeve 5 it burns with the sooty flame of a conventional lard-pail type burner. The rate at which the oil is admitted to combustion and vaporizing chamber 1 is controlled by valve 4 or other suitable means to provide a rate of flow such that all of the oil flowing down the inner surface of chamber 1 is vaporized before it reaches the bottom of sleeve 5.

The embodiment of applicants' novel burner illustrated in Figure 1 can be further modified as illustrated in Figure 2. Thus, for example, cylinder 5 may be extended to surround chamber 1 as shown in Figure 2. The upper periphery of cylinder 5 in this modification of applicants' novel burner should be at least at the vertical midpoint of inner pipe or combustion and vaporizing chamber while the bottom of sleeve 6' may be slightly below the level of the upper end of chamber 1 or may be at a point just sufficiently above the upper rim of sleeve 5 as to permit both to function. By extending sleeve 5 upward at least half the height of the combustion and vaporizing zone 1, the primary air is preheated. Extending sleeve 6' appreciably below the upper rim of combustion and vaporizing zone 1 permits the secondary air likewise to be heated. Sleeve 6' is supported in any suitable manner as by a plurality of bars 8. Three bars 7' support combustion chamber 1.

We claim:

1. A countercurrent vaporizing flare burner comprising an upright tube, an upright elongated cylindrical combustion and vaporizing chamber having only its lower portion within said upright tube, substantially concentric therewith and spaced therefrom to provide an annular orifice for primary air, an upright sleeve surrounding

and substantially concentric with only the upper portion of said combustion and vaporizing chamber and spaced therefrom to provide an annular orifice for secondary air, conduit means for introducing liquid fuel into said combustion and vaporizing chamber at the inner surface thereof and in the region of the top thereof, means for regulating the flow of liquid fuel in said conduit means, and means supporting said combustion and vaporizing chamber in spaced relation with the bottom of said upright tube and supporting said upright sleeve with the upper end thereof extending beyond the upper end of said combustion and vaporizing chamber.

2. A countercurrent vaporizing flare burner as described and set forth in claim 1 in which the upper portion of the upright sleeve surrounding and substantially concentric with only the upper portion of said combustion vaporizing chamber, is tapered sufficiently to increase the velocity of the gases emerging from the combustion and vaporizing chamber.

3. A countercurrent vaporizing flare burner as

described and set forth in claim 1 in which the upright sleeve, substantially concentric with the combustion and vaporizing chamber is an upright truncated cone placed with the greatest diameter of said cone below the upper end of said combustion and vaporizing chamber.

4. A countercurrent vaporizing flare burner as described and set forth in claim 1 in which a major portion of the upright elongated cylindrical combustion and vaporizing chamber is within the upright tube.

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