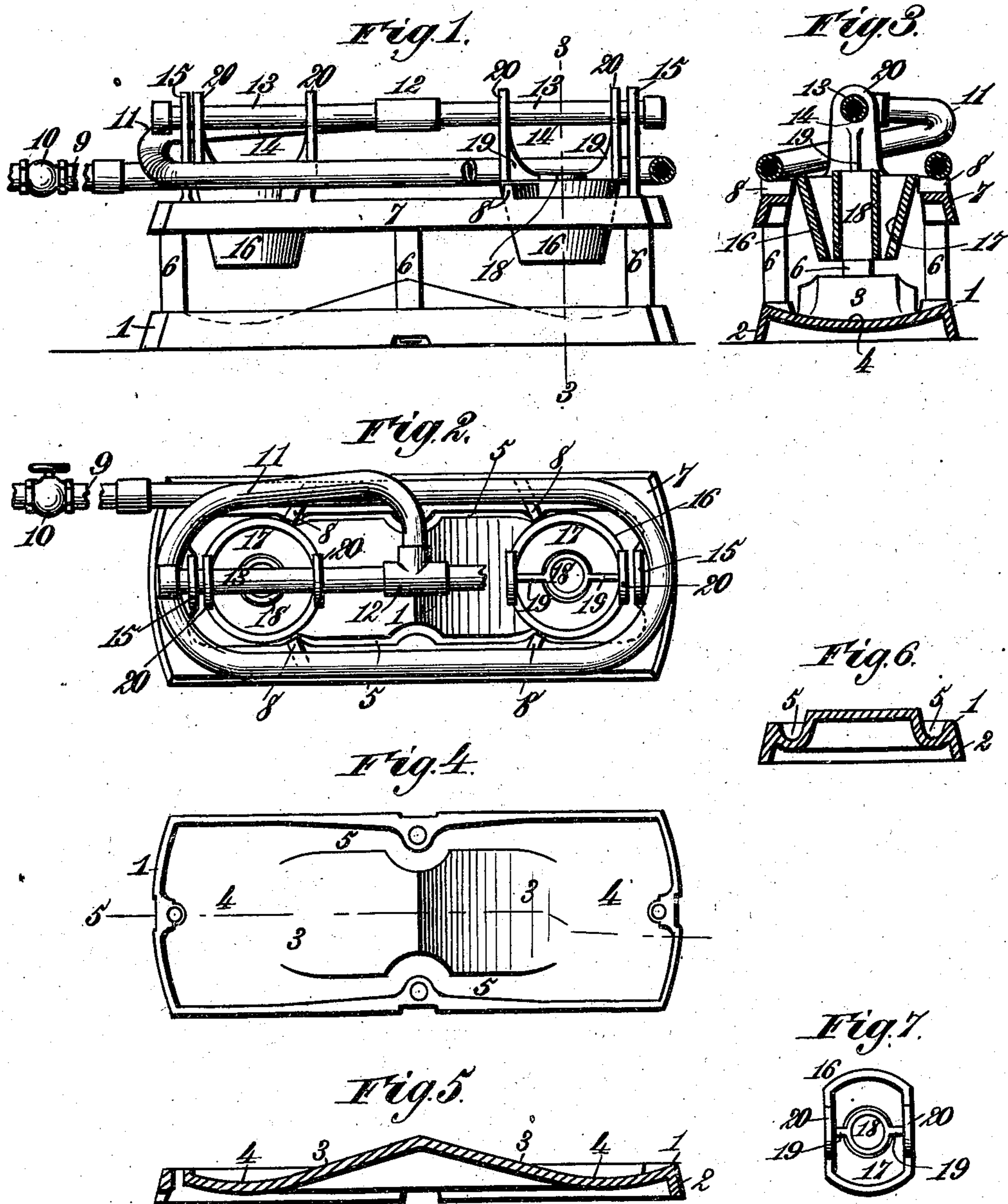


(No Model.)

S. STEWART & H. S. CARNES.
HYDROCARBON BURNER.

No. 545,744.

Patented Sept. 3. 1895.



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UNITED STATES PATENT OFFICE.

SIMEON STEWART AND HOMER S. CARNES, OF LIMA, OHIO.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 545,744, dated September 3, 1895.

Application filed April 2, 1895. Serial No. 544,204. (No model.)

To all whom it may concern:

Be it known that we, SIMEON STEWART and HOMER S. CARNES, citizens of the United States, residing at Lima, in the county of Allen and State of Ohio, have invented new and useful Improvements in Hydrocarbon-Burners, of which the following is a specification.

Our invention relates to improvements in hydrocarbon-burners, and has for its object to provide means for evenly distributing the heat over the space to be heated, to thoroughly mix the hydrocarbon vapors with a plentiful supply of superheated air, and to improve and simplify the construction of devices of this nature generally.

To these ends our invention consists in the features and in the construction and arrangement of parts, hereinafter fully described and afterward definitely pointed out in the claims following the description, due reference being had to the accompanying drawings, forming a part of this specification, wherein—

Figure 1 is a side elevation of our improved burner. Fig. 2 is a top plan view thereof. Fig. 3 is a vertical cross-section taken on the line 3 3 of Fig. 1. Fig. 4 is a top plan view of the base or deflector plate. Fig. 5 is a longitudinal section taken on the line 5 5 of Fig. 4. Fig. 6 is a transverse central section of the deflector-plate, and Fig. 7 is a top plan view of a modified form of mixer.

In the drawings we have illustrated a double burner especially designed for use in a stove; but it will be evident that one or any number of burners may be employed, and that the same may be employed for any of the purposes to which hydrocarbon-burners are applicable.

Referring to the drawings, the numeral 1 indicates the base of the burner consisting of a rectangular plate having parallel sides and segment-shaped ends and having a downwardly-projecting flange 2 about its sides and ends. Said plate is highest at its center and gradually inclines downwardly toward the opposite ends, as at 3, and near the ends is curved in cross-section, as shown in Fig. 3, and thence inclines upwardly to the ends, forming two concaved or cup-shaped oil-receptacles 4. Channels 5 are arranged upon the opposite sides of the deflector-plate 1 and afford communication between the two oil-receptacles 4, for the purpose hereinafter described.

Bolted to the opposite sides and ends of the deflector-plate 1 are uprights 6, which support a frame or shelf 7, that is of the same size and general shape as the deflector-plate 1, and said shelf upon its upper and opposite sides is provided with lugs 8 that project above the plane of the shelf to form supports for the vaporizing-pipe and also project laterally inward to form guides for the mixers, as will more fully hereinafter appear.

The numeral 9 indicates the oil-supply pipe provided with a valve 10, and connected with one end of a coiled vaporizing-pipe 11 that rests upon the lugs 8 and at its other end is provided with a T-coupling 12, from which latter project in opposite directions two superheating-pipes 13 that are closed at their outer ends, and near each end upon the underside are provided with jet-apertures 14. Said superheating-pipes are supported at their outer ends by uprights 15 that are secured to or cast with the shelf 7.

Suspended from the superheating-pipes 13 are mixers 16, each consisting of a hollow shell 17 of the shape of an inverted truncated cone, and having centrally arranged therein a tube 18 that is supported in place by webs 19 cast integral with said shell and tube. The shell 17 is provided with two perforated ears 20, which are slipped over the superheating-pipe and by means of which the mixers are suspended from said pipes over the oil-receptacles 4 and in such manner that the tube 18 shall accurately align with the jet-apertures 14. The lugs 8 that project diagonally inward, as before described, guide the mixers 16 into place and insure the tube 18 being arranged in proper relation to the jet-aperture.

Instead of making the mixer circular in shape, as above described, the same may be formed elongated, as shown in Fig. 7, having its opposite sides parallel, as shown; and this form is especially desirable where several burners are employed in close juxtaposition to one another.

The operation of our improved burner is as follows: The valve 10 being opened the oil flows through the vaporizing-pipe 11 into the superheating-pipes 13 and escapes by the jet-apertures 14 and drips into the oil-receptacles 4. The channels 5 insure an equal supply of

oil to both receptacles. The oil is now ignited, the flames enveloping the upper portion of the burner and vaporizing the oil contained in the pipes. The vapor generated in the coil 11 is superheated in the pipes 13 and issues in jets from the apertures 14 and is projected with great force down through the tubes 18. The mixers 16, creating a strong downward draft of superheated air in the space between the tube 18 and shell 17, and as the vapor and air issue from the mixer they are intimately mixed and are projected down in a burning condition against the deflector-plate 1, the inclined faces of which diffuse the heat throughout the combustion-chamber, the raised and inclined central portion of said plate throwing the heat outward from the center of the burner, where it would otherwise be concentrated. By supporting the vaporizing-coil upon lugs, as shown, the pipe is held out of contact with the metallic surface of the shelf, whereby the oil therein is very quickly vaporized in the initial burning. Moreover, such arrangement permits the passage of the air between the shelf and the vaporizing-pipe, thus protecting the pipe from direct contact with the flame.

Having described our invention, what we claim is—

- 30 1. A hydrocarbon burner, consisting of a deflector plate having an oil receptacle, a vaporizing coil supported above said plate, a superheating pipe connected therewith and provided upon its under side with a jet aperture
- 35 and a mixer suspended from said superheating pipe over the oil receptacle and consisting of an inverted truncated-cone-shaped shell having centrally supported therein a tube arranged directly beneath the jet aperture, an

air passage gradually diminishing in area from top to bottom being formed between the shell and tube, substantially as described.

2. A hydrocarbon burner, consisting of a deflector plate having oil receptacles, of a shelf supported above the same and provided upon its upper side with inwardly projecting raised lugs, a vaporizing coil supported upon said lugs, superheating pipes connected with said coil and supported by uprights carried by said shelf, said pipes being provided upon the under side with jet apertures, mixers, one for each jet aperture, provided with perforated ears, said mixers being suspended from the superheating pipes by said ears and held in alignment with the jet orifices by the said lugs, substantially as described.

3. A hydrocarbon burner, consisting of a deflector plate raised at its center and inclined downwardly in opposite directions therefrom toward its ends, concaved oil receptacles formed in the ends of said deflector plate, channels connecting said oil receptacles, a vaporizing coil supported above said plate, superheating pipes connected with said coil and provided upon the under side with jet apertures arranged above said oil receptacles, and mixers arranged above said deflector plate and immediately beneath said jet apertures, substantially as described.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

SIMEON STEWART.
HOMER S. CARNES.

Witnesses:

R. C. EASTMAN,
G. M. SPRAGUE.