

No. 624,058.

Patented May 2, 1899.

J. C. LONG & J. E. WALLING.

CRUDE OIL BURNER.

(Application filed May 12, 1898.)

(No Model.)

2 Sheets—Sheet 1.

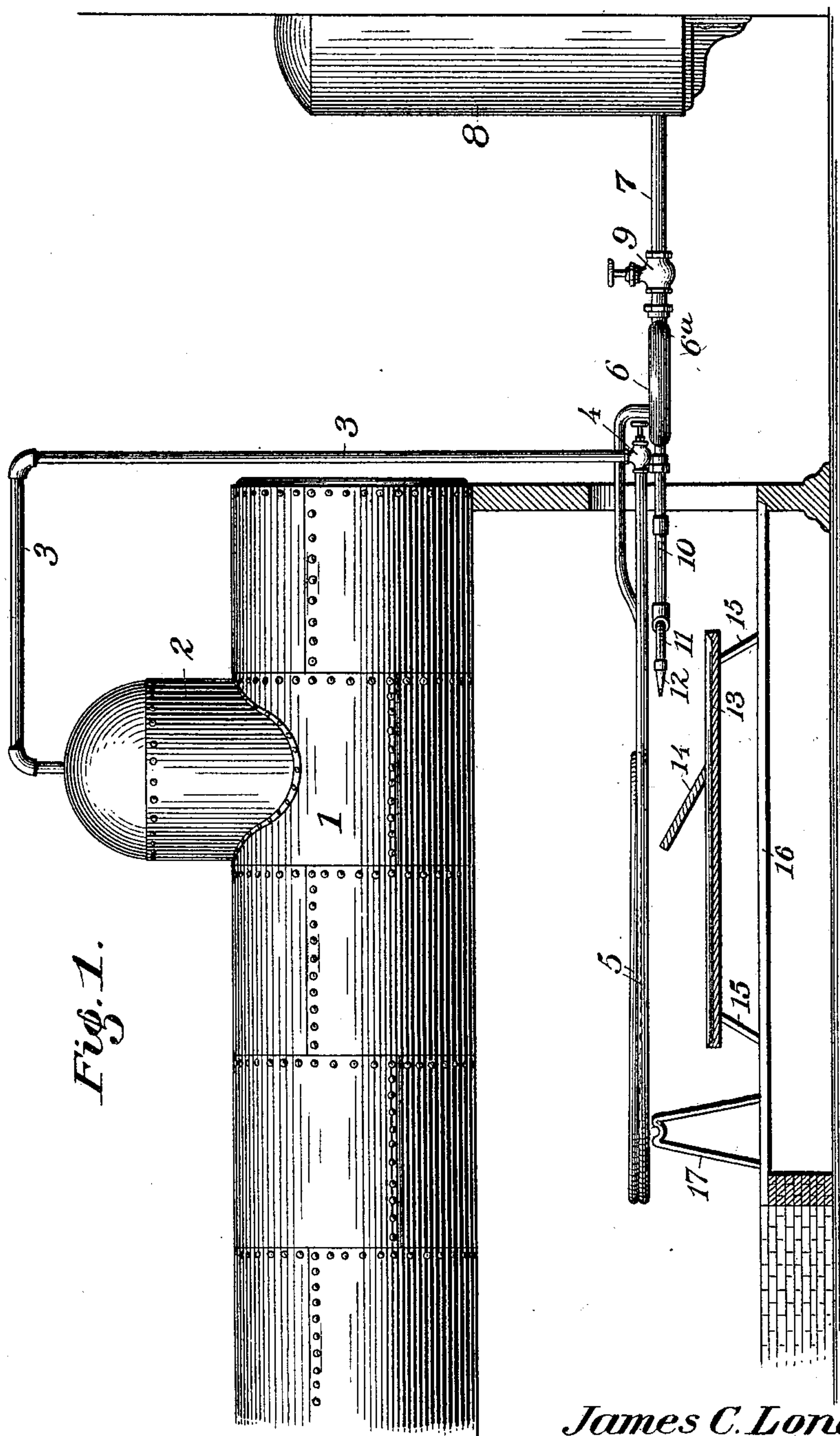


Fig. 1.

Witnesses

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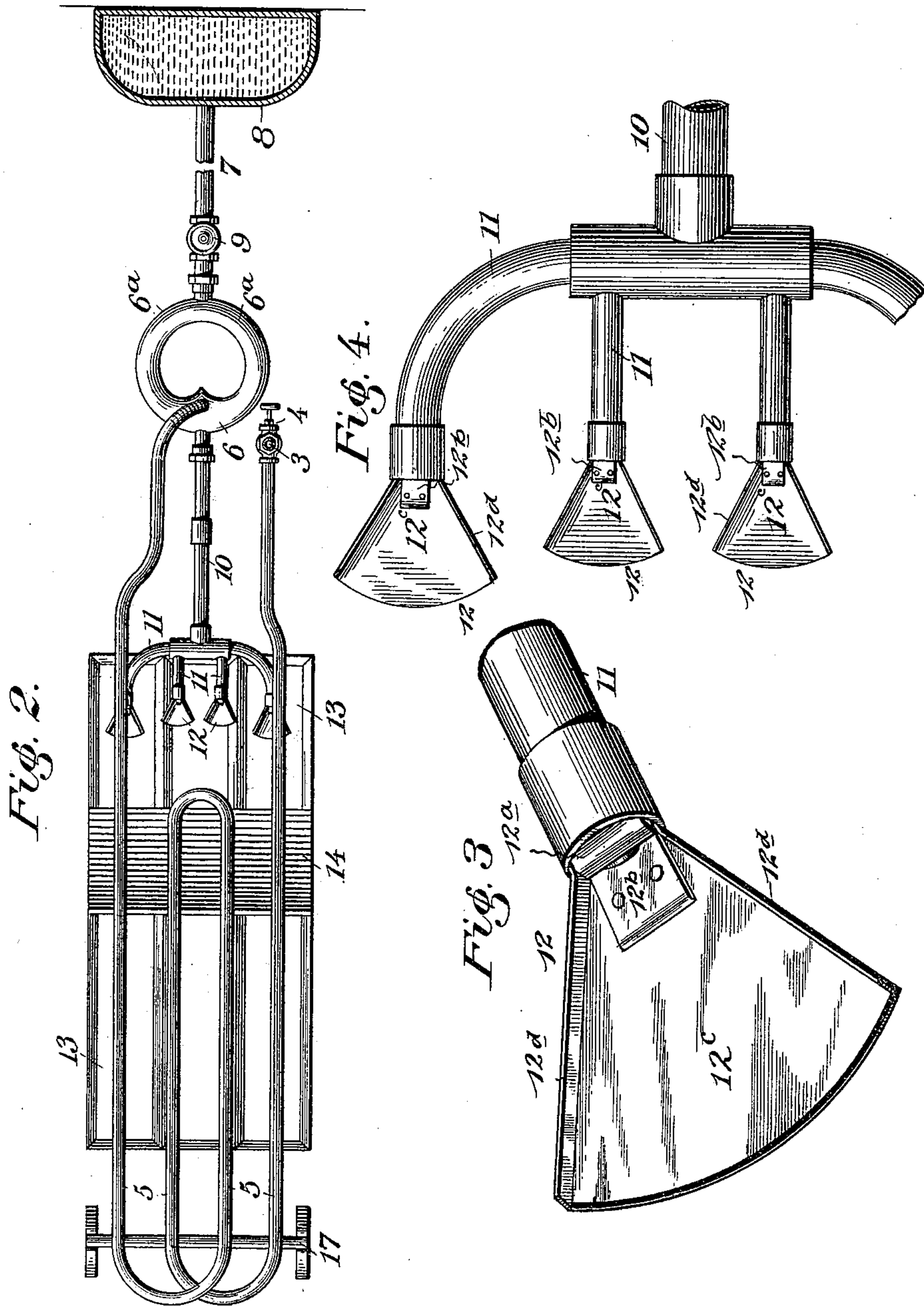
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Witnesses

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UNITED STATES PATENT OFFICE.

JAMES C. LONG AND JAMES E. WALLING, OF LEBANON, INDIANA, ASSIGNORS
OF ONE-HALF TO S. H. LONG AND E. G. LONG, OF SAME PLACE.

CRUDE-OIL BURNER.

SPECIFICATION forming part of Letters Patent No. 624,058, dated May 2, 1899.

Application filed May 12, 1898. Serial No. 680,499. (No model.)

To all whom it may concern:

Be it known that we, JAMES C. LONG and JAMES E. WALLING, citizens of the United States, residing at Lebanon, in the county of Boone and State of Indiana, have invented a new and useful Crude-Oil Burner, of which the following is a specification.

Our invention relates to improvements in burners for hydrocarbons and crude oils, and has for its object to provide a simple, compact, and efficient construction and arrangement of parts designed for economizing in the use of fuel by insuring a complete combustion thereof, and hence obtaining the maximum heat from a given quantity of the same, the burner embodying our invention being particularly adapted for use in connection with furnaces or for heating boilers, but being also adapted for analogous uses under other conditions.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a side view, partly in section, of a burner apparatus constructed in accordance with our invention, the same being shown arranged in an operative position with relation to a boiler. Fig. 2 is a plan view of the burner. Fig. 3 is a detail view in perspective of one of the burner jets or tips. Fig. 4 is a detail plan view of a portion of the burner apparatus.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the drawings the burner embodying our invention is shown in connection with a boiler 1, from the steam-dome 2 of which extends a steam-feed pipe 3. This feed-pipe is provided with a controlling-valve 4 and communicates with a superheating-coil 5, adapted to be arranged in the furnace in connection with which the apparatus is employed, said superheating-coil leading to and communicating with a mixer 6. This mixer is also in communication with an oil-supply pipe leading from a tank 8 and provided with a controlling-valve 9. The burner-tube 10 extends from the mixer 6 into the furnace in a plane

below the superheating-coil 5 and is provided with a plurality of branch tubes 11, terminating in burners 12, consisting of pans 12^c, which are of fan-like construction, and tips 12^a, which are spread laterally or in plan and reduced in dimensions vertically, whereby as the steam, which has been superheated by passing through the coil 5, and the fuel, which has become mixed with the steam, are discharged from the tips 12^a they are sprayed, and hence are in highly-inflammable condition, calculated to insure a complete combustion. Located below the plane of the superheating-coil and also under the burner-tips is a plate 13, constituting a combined waste-pan or initial-ignition pan and reflector designed to catch drippings from the burner-tips, and also to cause all of the heat generated at the burner-tips to be reflected upwardly toward the boiler or other object to be heated, and also to maintain the pipes 5 in a proper condition for superheating the steam which passes therethrough. Also arranged in front of the burner-tips and in the paths of spray discharged therefrom and rising in a forwardly-inclined position from the pan 13 is a deflector 14, which serves to throw or deflect the spray and flame upwardly toward the superheating-pipes and the boiler or other object to be heated.

In the construction illustrated the pan 13 is provided with suitable standards or up-rights 15, which rest upon the grate, (indicated at 16,) and also rising from the grate or other suitable portion of the furnace or fire-box thereof is a support 17 for the contiguous portions of the steam-coil 5.

In practice it is obvious that the supply of both the steam and the fuel may be regulated by the valves provided for that purpose to insure the desired consumption of fuel in proportion to the amount of steam admitted to the burners, and as the steam is not mingled with the fuel until after it has passed through the coil 5, and hence has been superheated, it is obvious that the discharge of steam through the burner-tube 10 may be and preferably is utilized to draw the oil or fuel from the tank by suction. The mixer 6, which is preferably employed in this connection, is of the open-center construction, wherein branches 6^a com-

communicate with the fuel-supply tube, and hence divide the stream thereof, and again unite at an enlarged portion which is in communication with the steam-superheating coil. This construction serves to obstruct back pressure of the steam into the fuel-supply pipe 7 and cause the proper direction thereof into the burner-tube 10, besides insuring the intimate mixture of the superheated steam with the fuel by reason of the division of the stream of fuel into two branches. Hence when the mixture of steam and fuel reaches the burner tips or jets it is thoroughly mingled and the spray is in a proper condition for instant and efficient combustion.

The specific construction of burner-outlets which we prefer to use in connection with our apparatus embodies a horizontally-spread and vertically-contracted tip 12^a, having an extension or tongue 12^b, to which is secured the spray-pan 12^c, flanged at its sides, as shown at 12^d, and spread or enlarged horizontally from its point of attachment to the tube to its extremity. The bottom of this pan is inclined upwardly from the burner-tube to the free edge of the pan to increase the spreading effect produced upon the flame as it is discharged, and thus insure the efficient distribution of the heat.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described our invention, what we claim is—

1. In an apparatus of the class described, the combination of a valved fuel-supply pipe, a steam-superheating coil, a mixer in communication with the valved fuel-supply pipe, and also in communication with said steam-heating coil, a burner-tube communicating with the mixer and provided with a plurality of communicating branches, and laterally-spread burner-tips in communication with these several branches, the same being extended horizontally and contracted vertically toward their outlets, substantially as specified.

2. In an apparatus of the class described,

the combination of a valved steam-supply pipe, a horizontally-disposed steam-superheating coil in communication with said supply-pipe, a reflecting-plate located below the plane of said superheating-coil, and constructed to receive drippings, a mixer in communication with a valved fuel-supply pipe, and also in communication with the superheating-coil, a burner-tube in communication with the mixer and provided with branches, located between the planes of said reflecting-plate and superheating-coil, and terminating in burner-tips disposed horizontally, and an inclined deflector 14 rising from said reflecting-plate in front of the burner-tips, substantially as specified.

3. In an apparatus of the class described, the combination with a superheating-retort, conveyers for fuel and a combustion-supporting agent, and a burner-tube for receiving the fluids after the mixture thereof, of a burner-tip having a horizontally-spread and vertically-contracted outlet, and a spray or burner pan extending forwardly from the burner-tip, spread toward its free end and laterally flanged, said pan being inclined upwardly toward its free edge, substantially as specified.

4. In an apparatus of the class described, the combination with a superheating-retort, conveyers for fuel and a combustion-supporting agent, and a burner-tube for receiving the fluids after the mixture thereof, of a burner-tip of which the outlet is contracted vertically and spread horizontally, a tongue extending forwardly from the burner-tip, and a spray or burner pan attached to said tongue, spread laterally toward its front edge and provided with lateral flanges, the bottom of said pan being inclined upwardly toward its free edge, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

JAMES C. LONG.

JAMES E. WALLING.

Witnesses:

JAMES L. HENDRICKS,

JNO. D. ALEXANDER.