

No. 757,182

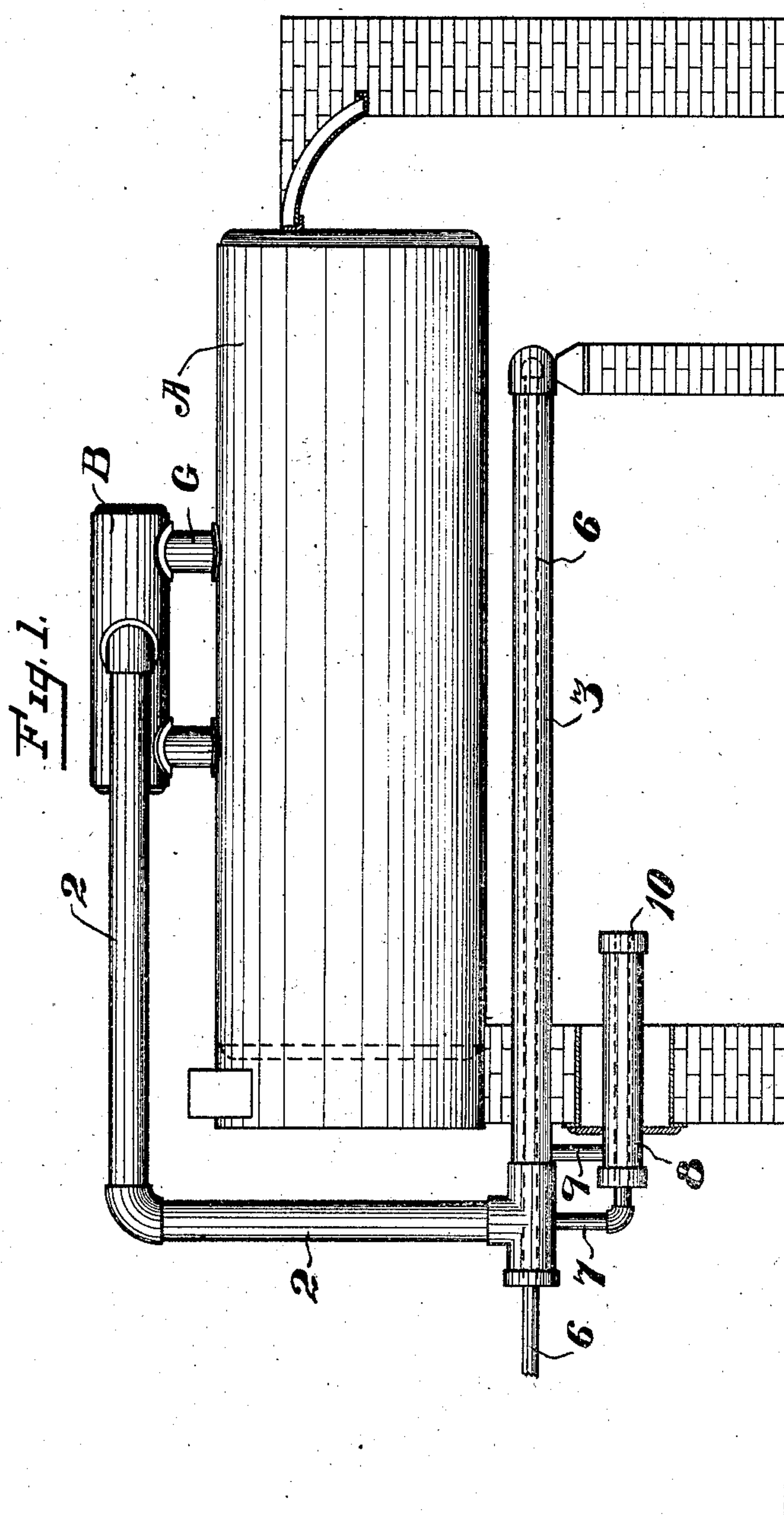
PATENTED APR. 12, 1904.

J. M. DONAHUE.
SUPERHEATER FOR OIL BURNERS.

APPLICATION FILED OCT. 16, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses,

Edw. Morse
Dudley Moss.

Inventor,
James M. Donahue
By Geo. H. Strong. atty

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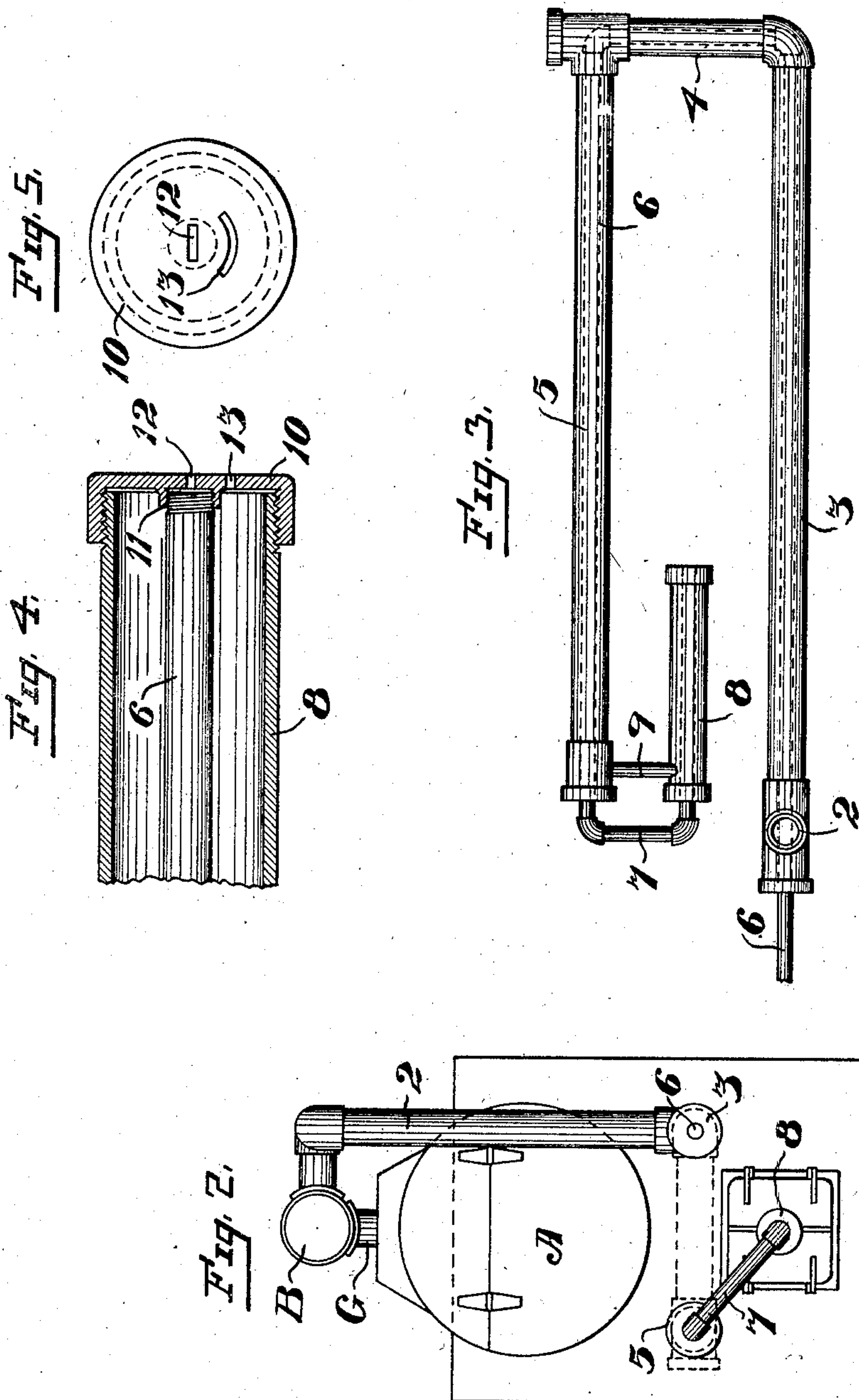
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UNITED STATES PATENT OFFICE.

JAMES M. DONAHUE, OF SANTA ROSA, CALIFORNIA.

SUPERHEATER FOR OIL-BURNERS.

SPECIFICATION forming part of Letters Patent No. 757,182, dated April 12, 1904.

Application filed October 18, 1903. Serial No. 177,235. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. DONAHUE, a citizen of the United States, residing at Santa Rosa, in the county of Sonoma and State of California, have invented new and useful Improvements in Superheaters for Oil-Burners, of which the following is a specification.

My invention relates to a superheating attachment and connection for oil-burners in conjunction with furnaces wherein such material is used as a fuel.

It consists, essentially, in a return-curved pipe located in the boiler-furnace, connection between the steam-drum of the boiler and one end of said pipe whereby steam may be caused to pass through the pipe, an oil-conducting pipe fitted centrally within the steam-pipe and following its course and extending back to the front of the boiler, connection between the oil-pipe and the burner, and a connection between the steam-pipe and the burner.

It also comprises details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal central section of boiler-setting, showing my superheater. Fig. 2 is a front elevation of same. Fig. 3 is a plan view of superheater-pipes. Fig. 4 is a longitudinal central section of end of burner. Fig. 5 is an end view of same.

A is a boiler of any suitable or desired description.

B represents the steam-drum, into which the steam from the boiler is conducted by connecting-pipes G in the usual manner.

2 represents a pipe opening out of the steam-drum leading down to a point adjacent to the front of the boiler-furnace, and at this point it is connected with a horizontal pipe 3. This horizontal pipe is of any suitable or desired diameter, extends into the boiler-furnace, and at the rear is connected by suitable elbows or couplings with a transverse pipe 4. By another elbow or T-coupling this pipe 4 is connected with a pipe 5, which returns to the front of the furnace and essentially parallel with the pipe 3.

The pipe 3 has a plug fitted into its end exterior to the boiler, with a central opening

into which an oil-conducting pipe 6 passes. This pipe 6 extends centrally through the interior of the pipe 3, and by suitable elbows and connections it is carried across within the pipe 4 and thence returned through the pipe 5 to the front, emerging from the front end of the pipe 5 through an opening in the plug or closure at the outer end of this pipe. By elbows this pipe 6 has its direction changed, as shown at 7, and it then enters the burner proper, as shown at 8, this burner extending and discharging into the furnace between and beneath the pipes 3 and 5. The steam passing through these pipes will become highly superheated after leaving the steam-drum B, and the oil passing through the pipe 6 will be subjected to this increasing heat, so that any heavy asphaltic or other residue which would ordinarily not be vaporized will be so highly heated in passing through this pipe that it will be vaporized before reaching the burner at 8.

9 shows a connecting-pipe between the outer end of the steam-pipe 5 and the burner, so that the superheated steam from this pipe may be admitted into the burner and mingled with the oil to be discharged at the front end. Air may also be admitted into the pipe surrounding the burner-pipe, so that a sufficient quantity may be delivered to provide for the best combustion of the fuel.

As here shown, the discharge end of the burner consists of a cap 10, threaded to screw upon the end of the outer pipe and having its central portion formed with a socket or depression with screw-threads of the same pitch with the outer ones, as at 11. This allows the cap to be screwed simultaneously upon both the outer and the inner tubes of the burner or similarly removed. Two narrow slits 12 and 13 are made in this cap, one registering with the inner oil-pipe and the other with the steam-pipe and just below the one first named, so that the steam discharged from the slit 13 intersects and mingles with the oil-vapor from the slot 12.

By this construction the steam and oil are not only highly heated while passing through the furnace, but the oil-pipe being inclosed and jacketed within the steam-pipe is protected from direct contact with the fire.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with a furnace, of a pipe 5 receiving steam therefrom, a pipe connected with the first-named pipe and extending horizontally beneath the boiler said second pipe returned substantially upon itself to the front of the boiler, the two members of the said pipe 10 lying in substantially the same horizontal plane, a burner positioned in a lower horizontal plane than the steam-pipe, and an oil-pipe concentric with and extending throughout the steam-pipe and having its returned end con- 15 nected with the burner.

2. The combination with a steam-boiler and a steam-drum connected therewith, of a steam-pipe leading from the drum, a second pipe 20 into which the steam-pipe leads said second pipe extending through the front of the furnace and beneath the boiler and thence bent horizontally and returned to the front of the furnace, the parts of said second pipe lying 25 in substantially the same horizontal plane, a burner positioned in a lower horizontal plane than the steam-pipe and leading through the front of the furnace, an oil-pipe concentric with and traversing the second-named pipe, and a pipe connecting the returned end of the 30 oil-pipe with the burner.

3. The combination with a steam-boiler and an oil-burner, of a pipe connected with and receiving steam from the boiler, a return-pipe within the furnace and having its members in substantially the same horizontal plane, an 35 oil-pipe within and traversing the steam-pipe, a vertical pipe connecting the oil-pipe with the burner, and an independent vertical pipe connection between the steam-pipe and said burner. 40

4. The combination with a steam-boiler, a furnace, a pipe connected with the boiler and extending through the furnace, and an oil-pipe located concentrically within the first-named pipe, of a burner formed of outer and 45 inner concentric tubes with which the superheating steam and oil pipes respectively connect, a flat screw-cap fitting the discharge end of the outer tube, and having a screw-threaded depression engaging the end of the inner tube, 50 and discharge-slits formed in said cap and communicating respectively with the steam and oil pipes of the burner.

In testimony whereof I have hereunto set my hand in presence of two subscribing wit- 55 nesses.

JAMES M. DONAHUE.

Witnesses:

J. R. LEPPA,

GEO. BURMESTER.