

J. McDERMOTT.
OIL BURNER.

APPLICATION FILED SEPT. 27, 1902.

NO MODEL.

Fig. 3

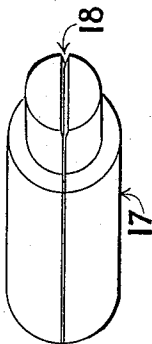


Fig. 2

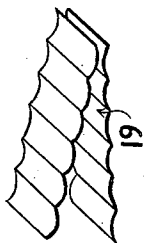


Fig. 5.



Fig. 1

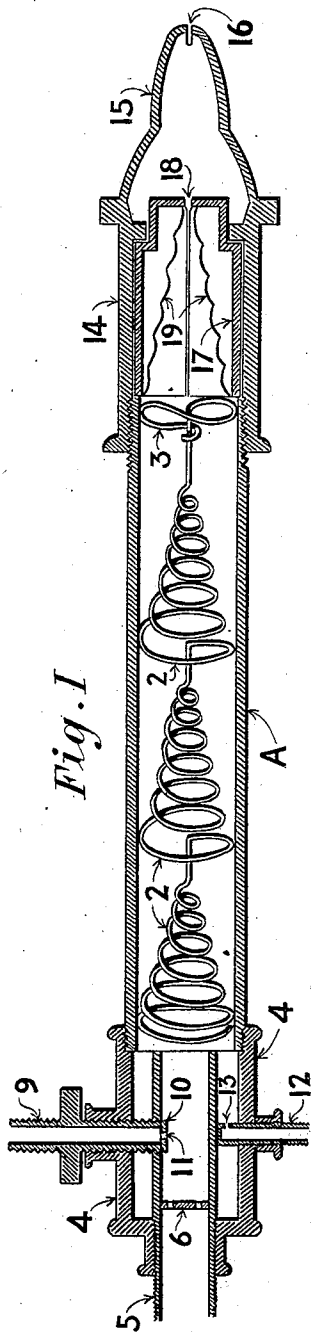


Fig. 4

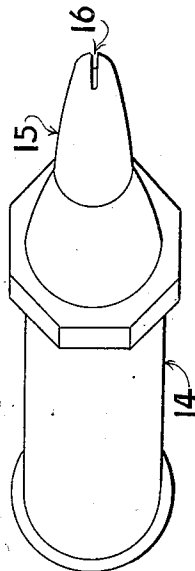


Fig. 7.

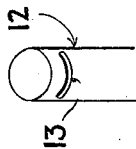


Fig. 6.



Witnesses,

[Signature]
F. F. S. Kelsey

Inventor,
John McDermott
Devey Stringer atty

UNITED STATES PATENT OFFICE.

JOHN McDERMOTT, OF WEST BERKELEY, CALIFORNIA.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 722,530, dated March 10, 1903.

Application filed September 27, 1902. Serial No. 125,071. (No model.)

To all whom it may concern:

Be it known that I, JOHN McDERMOTT, a citizen of the United States, residing at West Berkeley, county of Alameda, State of California, have invented an Improvement in Oil-Burners; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for the combustion of hydrocarbon oils and its preparation therefor previous to reaching the burner-tip.

It consists of devices by which the oil is finely divided and mixed with a suitable quantity of steam or air and finally delivered from the burner-tip in condition for combustion.

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 section of burner. Fig. 2 is a general view of corrugated baffle-plates. Fig. 3 is an outside view of inner and concentric chamber. Fig. 4 is a general view of chamber at front end of A with burner attached. Fig. 5 is a bottom end view of oil-inlet pipe. Fig. 6 is a face view of disk 6. Fig. 7 is a view of the upper end of pipe 12.

I have here shown my apparatus as consisting of a tubular chamber A, having within it a series of spirally and conically twisted wires 2. One or more of these spiral cones may be disposed within the chamber. I have here shown the device as comprising three of such spirals, the wire from the apex of one cone being continued and expanded to form the base of the second cone, and so on to the last one. The wire from the last one extends to the end of the tube A and is there expanded in any suitable manner, as shown at 3, to retain the cones approximately central within the tube A. To the rear end of the tube A is screwed a nipple or chamber 4, and into the rear end of this chamber extends a pipe 5, adapted to conduct steam or air. This pipe extends close to the base of the first spiral cone 2 and is interrupted at a point anterior to the oil-supply tube by a perforated diaphragm or baffle-plate 6, and through the openings made in this plate the steam passes in fine jets. The oil-pipe 9 extends down

through the side of the chamber 4 and into the pipe 5 between the plate 6 and the rear of the first cone 2. The bottom of the pipe 9 is closed by a plate 10, having a slot 11 made transversely across it, so that the oil passing down through the pipe 9 passes into the pipe 5 in the form of a thin sheet extending approximately across the pipe. The jets of steam from the rear strike this sheet of oil, which is thus blown into forcible contact with the coil or coils 2 and carried through them. The repetition of these coils repeats the action of the first one in more completely subdividing and comminuting the oil and thoroughly mixing it with the steam or steam and air, if the latter be employed.

In order to prevent the oil from settling upon the bottom of the tube A, I have shown a second pipe 12, opening into the lower part of the chamber 4 and below the pipe 5. The inner end of this pipe 12 is closed, as shown, and in the side of it is made a horizontally-disposed slit, as shown at 13. Through this slit the steam or hot-air jet is discharged beneath the pipe 5 and along the lower part of the chamber A, this jet serving to keep any oil from being deposited in the lower part of the chamber A.

To the front end of the pipe A is secured the chamber 14, and to the front end of this chamber is connected the burner-tip 15, which may be made of any suitable or desired shape, having, preferably, a discharge-slit 16, through which the combustible is finally delivered to the furnace.

Within the chamber 14 is contained an inner and essentially concentric chamber 17, which is here shown as formed in two halves lengthwise and having a closed outer end with a narrow discharge-slit transversely across it, as shown at 18. Within this chamber are fixed the corrugated baffle-plates 19. These plates are here shown as being formed with a series of concavo-convex channels extending transversely from side to side, one in the upper and the other in the lower half of the chamber 17, and the plates are so set that the portions presented toward the chamber A are separated from each other to nearly the full diameter of the chamber 17. Thence they converge to the discharge-opening 18 in the front end of the chamber. The object of

these plates is to receive the impact of the oil and steam, which is being continually discharged with considerable force while the burner is in operation. Experience has shown that this discharge very rapidly wears out the burner-tips of such apparatus, and the object of the construction is to provide the interior removable chamber 17 and baffle-plates 19 to receive this impact, these being cheaply replaced by simply unscrewing the chamber 14 and replacing the parts 17 and 19 when worn out. In this manner the burner-tip is relieved from the greater portion of the wear to which it would be otherwise subjected and will last for a long time.

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

1. An apparatus for burning petroleum-oil consisting of a chamber having one or more spiral conical coils located therein, a burner-tip connected with the front end of said chamber, a steam or air inlet pipe axially in line with the rear end, and a pipe through which oil is delivered at an angle with the steam-jet and behind the spiral coils, said oil-pipe discharging the oil in a thin sheet-like form approximately across the chamber and in the path of the steam-jet.

2. An apparatus for the combustion of hydrocarbon oils consisting of a tubular chamber having one or more spiral conical coils located axially between the rear and front end, a burner-tip connected with the front end, a steam or air inlet pipe opening into the rear of the chamber and in line with its axis, an oil-conducting pipe opening at an angle into the steam-pipe having a transverse slit at the lower end whereby the oil is delivered in a sheet across the steam-pipe and is blown thereby into and through the coils in the chamber.

3. An apparatus for burning hydrocarbon oil, consisting of a chamber having the burner-tip at the front, a plurality of spiral conical coils located axially in said chamber, a steam or air inlet pipe extending into the rear of the chamber and in line with its axis, an oil-conducting pipe opening into the upper part of the steam-pipe at right angles therewith and

having a transverse slit by which the oil is delivered into the pipe in a thin sheet, a perforated diaphragm fixed in the steam-pipe behind the oil-inlet pipe whereby the steam is delivered in jets against the sheet of oil and the mixed product is forced through the coils.

4. An apparatus for the combustion of hydrocarbon oil consisting of a chamber having a burner-tip at the front, a plurality of connected spiral conical coils located axially within the chamber; a centrally-disposed steam and air pipe extending into the rear of the chamber and axial therewith, an oil-conducting pipe entering the top of the steam-pipe at right angles and having a transverse slit through which the oil is delivered in a sheet across the steam-pipe, a perforated plate through which the steam-jet is discharged against the sheet of oil, and the latter blown through the coils in the chamber, a pipe entering the lower part of the chamber behind the coils having a horizontal forwardly-directed slit whereby a jet of heated medium is discharged through the lower side of the chamber and the coils to prevent the settling of the oil.

5. An apparatus for the combustion of hydrocarbon oil consisting of a mixing-chamber with oil and steam or air inlets at the rear, a burner-tip located at the front, a chamber interposed between the mixing-chamber and the burner-tip, said chamber consisting of removable cylindrical segments and transversely-disposed baffle-plates located therein.

6. An apparatus for the combustion of hydrocarbon oil consisting of a mixing-chamber having oil, steam and air inlets at the rear, a burner-tip at the front, a removable chamber located between the mixing-chamber and the burner-tip and baffle-plates located therein, said plates being formed with transverse concavo-convex grooves and convergent from the rear to the front.

In witness whereof I have hereunto set my hand.

JOHN McDERMOTT.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.