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APPARATUS FOR INSTANTLY EXTINGUISHING THE FLAME OF DISH TYPE OIL BURNERS

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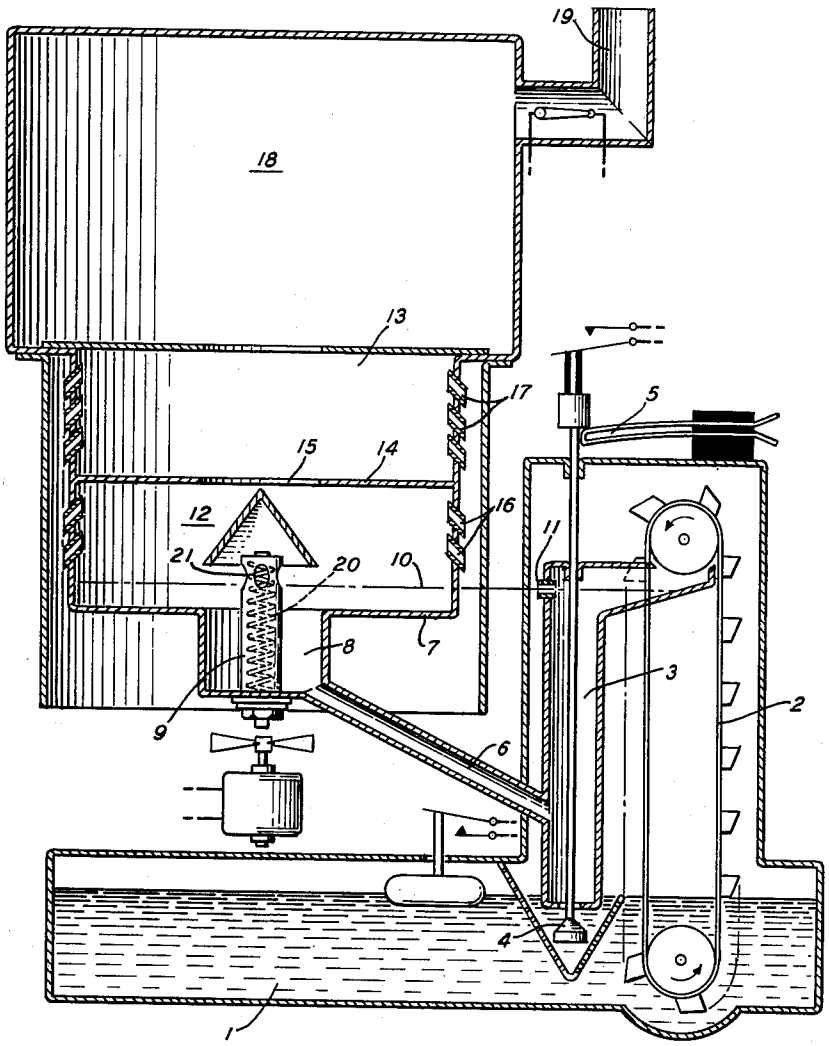

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APPARATUS FOR INSTANTLY EXTINGUISHING THE FLAME OF DISH TYPE OIL BURNERS

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This invention relates to an apparatus for instantly extinguishing the flame of oil burners of the dish, tray or plate type in which the combustible fuel oil is raised to boiling temperature, the generated vapors are mixed with air, and the mixture ignited and consumed.

Reference is made to my copending application Serial Number 697,219, filed November 18, 1957, in which there is described in detail an illustrative embodiment of oil furnaces of the type to which the instant invention relates.

When the supply of fuel oil to burners of the prior art constructions is stopped, the flame of the burner is not immediately extinguished. The oil on the burner plate, dish or tray burns and, while the flame contracts appreciably, it does not go out because the hot plate and its surroundings, which may be designated the "hot zone," transmits heat to the oil feed line. The latter, no longer cooled by the flow of cool oil therethrough, is heated and the oil therein commencing to boil gives off oil vapor for quite an interval, sufficient to maintain a small, soot-producing flame. Such after-burning may last as long as a half hour in prior art structures. As a result, there is not only the danger that the combustion chamber will be covered with soot, but also that the fuel oil supply line will be clogged by the soot. It is in part this reason which accounts for oil burners of this type not having been generally adopted.

It is an object of the instant invention to provide apparatus for instantly quenching the flame of such burners by providing instant removal of all oil in the hot zone when the burner is to be turned off.

Another object of the invention is to provide a control element in the fuel oil feed line between the oil storage tank and the burner plate which on actuation produces a drainage of the fuel oil from the burner plate and the feed line hot zone.

The foregoing, and other objects and features of the invention will be readily understood from the following detailed description of an illustrative embodiment of the apparatus according to the instant invention when read in conjunction with the appended drawing in which the sole FIGURE shows an elevational, highly simplified, diagram of an apparatus for instantly draining the hot zone of a dish, tray or plate type oil burner.

In the illustrative embodiment of the dish type oil furnace incorporating the instant invention shown in the sole figure of the drawing, the furnace is supported on the base 1 which is the fuel oil tank or reservoir, and is provided with a fuel oil conveyor and elevator 2 having a plurality of buckets of which but some are indicated, and an oil standpipe 3 having a drain valve 4 which is controlled by a bimetal couple 5 and is closed only when the burner is operating or running. A feed tube 6, inclined downwardly from burner tray 7 to the lower end region of standpipe 3, interconnects the burner tray and the standpipe. In a depressed, preferably central, region 8 of tray or dish 7 an electric ignition plug 9 is so positioned that its upper apertured end is above the level of maximum height 10 of oil possible in standpipe 3 as determined by the overflow opening 11 thereof. The tray or plate 7 is at the bottom of mixing chamber 12, divided from combustion chamber 13 by plate 14 having a central aperture 15, and both the mixing and combustion chamber walls having air intake slits 16 and 17, therethrough. As is well known in the art, a flame chamber 18 having a chimney 19 extending from its upper region, is above the combustion chamber 13, and such parts together with the other usual elements of oil furnaces and the electrical circuits interconnecting them, are shown in my above identified copending application; such elements, controls, circuits and the operation thereof being herein incorporated as though here fully set forth.

Oil is scooped out of the tank by the buckets of the vertical bucket coveyor and elevator 2, and having been raised to the open top of the standpipe, the oil contained in the buckets is poured into the standpipe. At its bottom region, as above stated, the standpipe is provided with drain valve 4, which, on starting the oil furnace and energizing the electrical circuit thereof, is raised by the upward bending of the free end of bimetal strip 5 sufficiently to close upon its seat in the standpipe, sealing the standpipe bottom so that the oil being poured into the standpipe remains therein with a gradually rising level. As is obvious from the figure, ultimately oil flows from the standpipe, by way of feed line 6, into the depressed region 8 of the burner dish 7 where it envelopes the lower portion of ignition plug 9. There it is heated by the heat transmitting shell of the ignition plug, the shell being heated by the electrically energized heating and ignition coil 20 within the plug shell, and the emitted oil vapors are ignited by an upper portion of the incandescent ignition coil exposed by aperture 21. As soon as valve 4 opens, and it opens promptly on the opening of the electrical circuit so that current no longer flows through the bimetal strip 5, the depression 8, dished plate 7, feed line 6, and the standpipe 3, are instantly emptied of oil which flows through the open bottom of the standpipe back into the oil tank.

What I claim is:

1. In an oil burner, the combination of a burner dish having a horizontal bottom portion, an electrical ignition plug having an upper apertured end for igniting oil in the bottom of the dish on energization, an oil reservoir, an upright elongated intermediate oil receptacle extending from a level substantially below to a level substantially above the bottom portion of the dish and positioned above the reservoir, means for supplying oil from the reservoir to the elongated receptacle, an oil feed line connecting a region of the receptacle below the plane of the bottom of the dish to the bottom of the dish, and valve means in the intermediate receptacle below the region at which the feed line connects to the receptacle selectively operable to closure to maintain on operation of the oil supplying means a level of oil in the receptacle and dish above the bottom portion of the dish to a maximum height not above the apertured top end of the plug, and to an open position to permit instantaneous drainage of all oil from the dish, feed line, and receptacle by gravity.

2. In an oil burner the combination according to claim 1 in which the valve means is actuated by thermal means responsive to starting of the burner to closure, and is maintained in closure while the burner is running.

3. In an oil burner, the combination of a burner dish having a horizontal bottom portion, an electrical ignition plug having an apertured upper end in the dish for igniting on energization oil in the bottom of the dish, an oil reservoir, an upright elongated oil receptacle positioned above the reservoir and extending from a level substantially below the bottom of the dish to a level substantially above the bottom of the dish, the intermediate receptacle being subjected to atmospheric pressure, a bucket conveyor interconnecting the reservoir and the receptacle for conveying oil from the reservoir to the

upper end region of the receptacle, an oil passage interconnecting the region of the receptacle below the bottom of the dish with the bottom of the dish, a valve engageable to a seat therefor defined in the bottom of receptacle, means operable to close the valve on its seat when starting the burner and to open the valve to drain oil substantially instantly from the dish, passage and receptacle on stoppage of the burner, and driving means to actuate the conveyor at such rate to spill oil into the receptacle that a predetermined level of oil above the bottom of the dish but not above the apertured top of the plug is maintained in the receptacle while oil is burned in the dish and the valve is closed.

4. In an oil burner, the combination of a burner dish having a horizontal bottom portion, an electrical ignition having an apertured upper end in the dish for igniting on energization oil in the bottom of the dish, an oil reservoir, an upright elongated oil receptacle positioned above the reservoir and extending from a level substantially below the bottom of the dish to a level substantially above the bottom of the dish, an overflow port in the receptacle at the horizontal plane of the apertured region of the plug in the dish, a bucket conveyor for supplying oil from the reservoir to the upper end region of the receptacle, an outer casing enclosing at least the top and intermediate regions of the receptacle and conveyor, a passage in the outer casing communicating the top of the receptacle with the atmosphere, an oil passage interconnecting the region of the receptacle below the bottom of the dish with the bottom of dish and passing through the outer casing, a valve, a valve seat defined in the bottom of the receptacle, means operable to close the valve on the seat when starting the burner and maintaining the valve thereon while the burner is running and removing the valve therefrom on stoppage of the burner substantially instantly to drain oil from the dish, passage and receptacle, and driving means to actuate the conveyor at such rate to spill oil into the receptacle that oil delivered to the receptacle while the valve is on the seat is continuously burned in the dish.

5. In an oil burner, the combination of claim 4 in which the outer casing extends vertically from an aperture defined by the upper wall regions of the reservoir, the valve being thus so positioned that on opening the valve from the seat the oil from the dish and passage flows into the receptacle and together with the oil from the receptacle spills from the receptacle into the reservoir.

6. In an oil burner, the combination of a burner dish, an oil reservoir wholly below the horizontal plane of

the bottom of the dish, an intermediate oil receptacle of elongated form extending from the reservoir to above the horizontal plane of the bottom of the dish, means for lifting from the reservoir to the region of the receptacle above the horizontal plane of the bottom of the dish measured quantities of oil to maintain a flame of predetermined size in the dish, an oil feed line connecting the receptacle at a region thereof below the mentioned horizontal plane to the bottom region of the dish, and means for draining by gravity at least the oil from the dish and in the hot region of the feed line back to the reservoir comprising a valve movable to close upon a seat defined in the bottom region of the receptacle and automatically actuable means to close the valve upon the seat while the flame is to be maintained burning and to open the valve from the seat when the flame is to be extinguished so that after-burning is prevented.

7. In an oil burner, the combination of a burner dish, an oil reservoir below the burner dish and aligned therewith, a fuel passage opening at one end into the burner, the other end of the passage being in a horizontal plane above that of the end opening into the burner, the fuel passage having an intermediate region below the horizontal plane of the burner dish and above the reservoir, means for lifting measured quantities of oil from the reservoir and spilling such measured oil quantities into such other passage end, and a closure means aligned with the reservoir in the intermediate passage region operable to closure on starting the burner so that the measured oil quantities flow into the dish by gravity, the closure means being maintained in closed position while the burner is running, and to open position instantly to drain the oil from the dish and fuel passage by gravity back into the reservoir when the burner is stopped whereby after-burning is eliminated.

References Cited in the file of this patent

UNITED STATES PATENTS

653,893	Wilder	July 17, 1900
1,431,054	Stockstrom	Oct. 3, 1922
1,786,832	Donley et al.	Dec. 30, 1930
2,498,484	Canty et al.	Feb. 21, 1950
2,519,241	Findley	Aug. 15, 1950

FOREIGN PATENTS

518,425	Germany	Feb. 16, 1931
749,072	Great Britain	May 16, 1956