F. J. NICE.

HYDROCARBON FEEDING SYSTEM.

APPLICATION FILED JUNE 10, 1912.

1,054,441.

Patented Feb. 25, 1913.

2 SHEETS—SHEET 1.

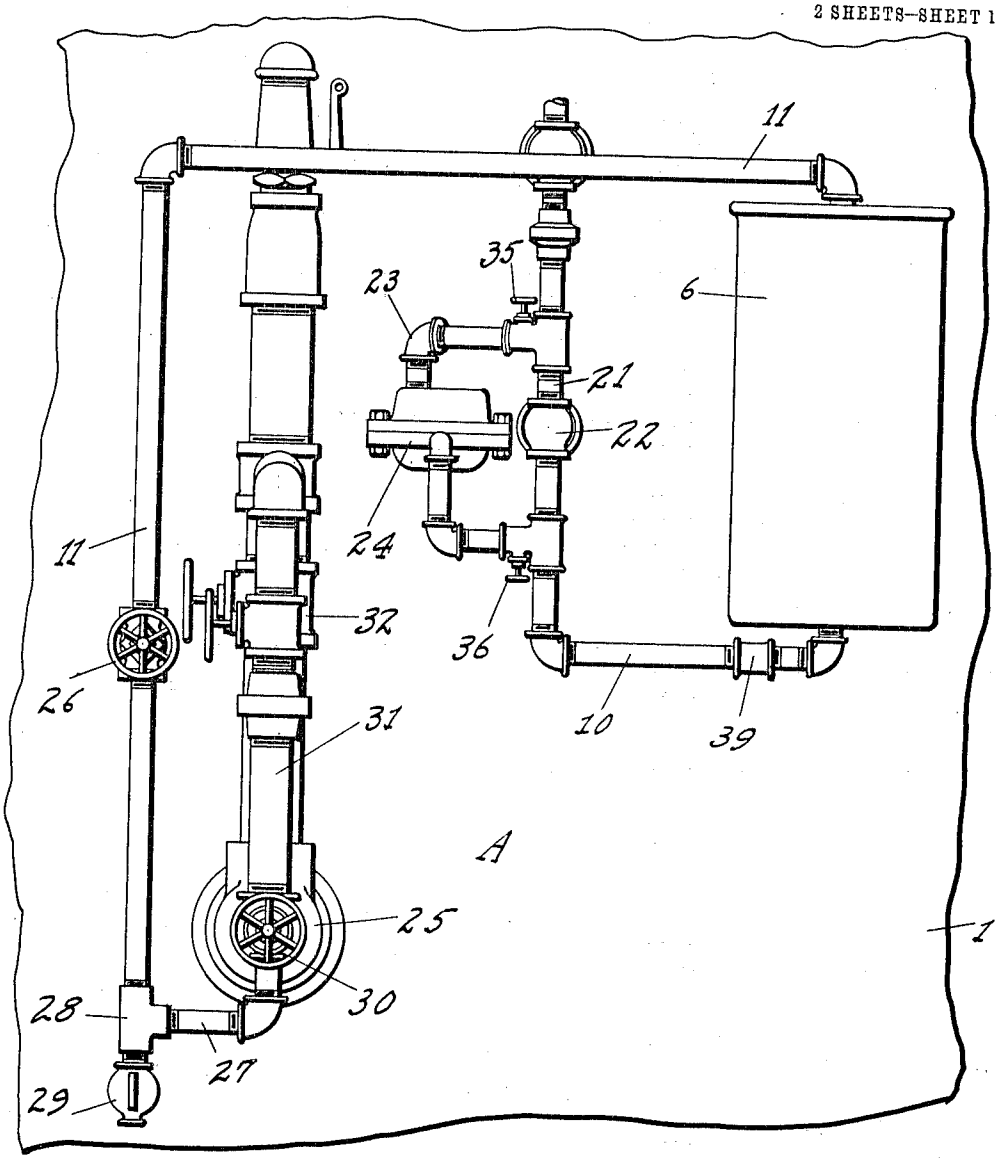

Fig. 1.

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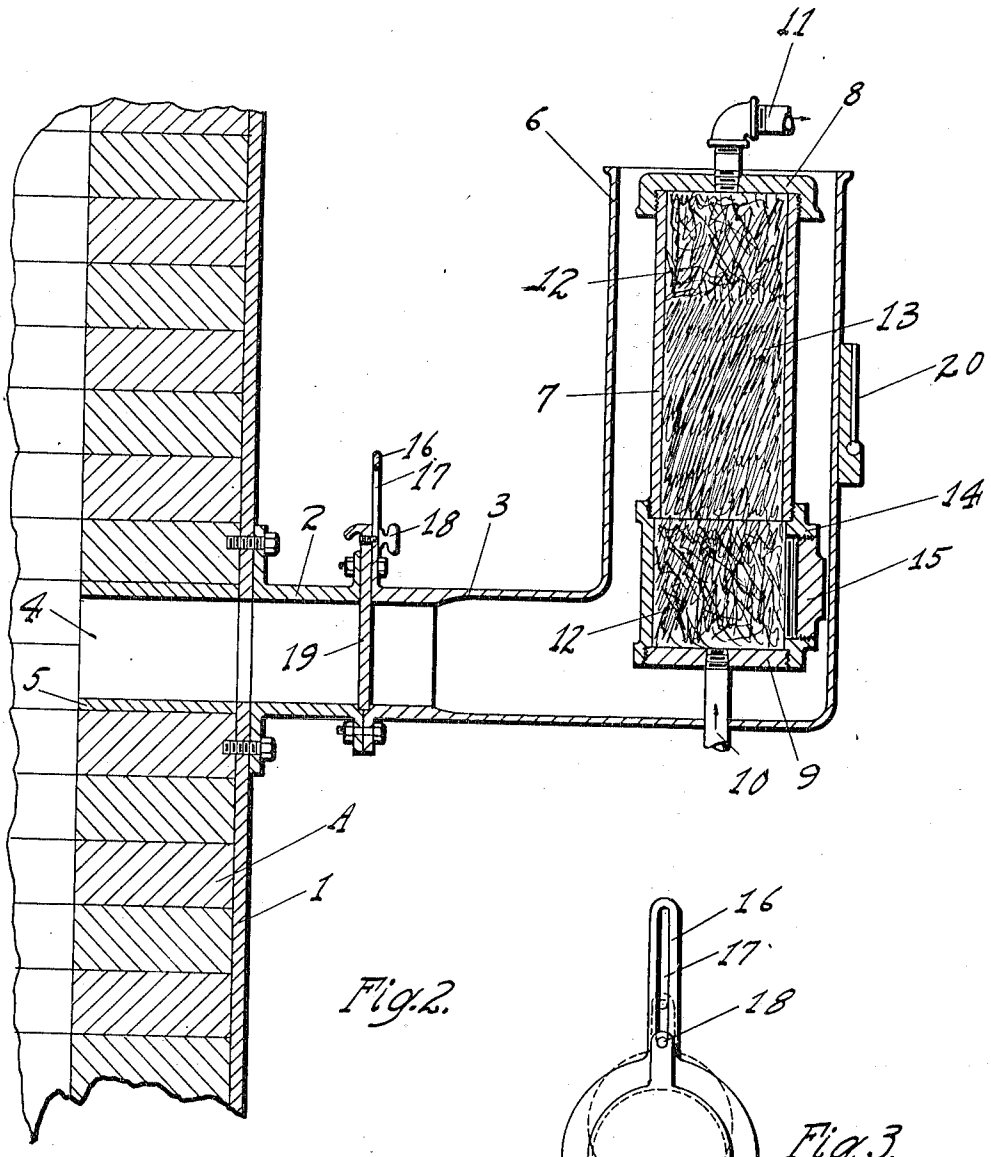

Fig. 2.

Fig. 3.

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FREDRICK J. NICE, OF PONTIAC, MICHIGAN.

HYDROCARBON-FEEDING SYSTEM.

1,054,441. Specification of Letters Patent. Patented Feb. 25, 1913.

Application filed June 10, 1912. Serial No. 702,689.

To all whom it may concern:

Be it known that I, FREDRICK J. NICE, a citizen of the United States, residing at Pontiac, county of Oakland, State of Michigan, have invented a certain new and useful Improvement in Hydrocarbon-Feeding Systems, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to oil feeding systems for hydro-carbon burners and has for its object a system adapted to filter and prepare the oil for combustion in a burner used in connection with smelting furnaces or other high temperature furnaces.

It has for its object a system which is adapted to thoroughly filter the crude oil before it is admitted to the burner and that is so arranged that the sediments or refuse resulting from the filtering process may be readily removed when desired.

A further object is a heating of the oil to prepare it for volatilization and mixing with the air. This heating arrangement is so arranged that heating the oil in no way interferes with the feeding apparatus and so that the temperature is under the control of the operator of the furnace.

In the drawings:—Figure 1, is an elevation of the piping forming the oil feeding system. Fig. 2, is a vertical section of the filter, the furnace, the stack which surrounds the filter and the connection with the furnace. Fig. 3, is a detail of the support for the heat-vent gate, viewed from the left of Fig. 2 with the union removed.

A, is the furnace built of refractory brick which has an inclosing shell 1, to which is bolted a pipe union 2 that connects the heat-vent 3 with the aperture 4 in the furnace wall. This aperture is lined with a metal lining 5. The heat-vent 3 at its outer end turns and enlarges, forming a stack 6. This stack is adapted to contain a filtering tank 7 which comprises a pair of cylindrical tubes screwed together. It will be noted that the vent 3 is bolted to the union 2 and it may be detached, and dropped to secure access to the filter. The cap 8 screws over the top of the upper tube and the plug 9 screws into the bottom of the lower tube. The oil is introduced into the bottom of the filter through the induction pipe 10 and it flows out of the filter through the eduction pipe 11. These pipes 10 and 11 screw into the plug 9 and cap 8, respectively. The interior of the tank 7 is filled with a filtering substance. I prefer to use a section of hair 12 at both the top and bottom. The space intervening between these sections is filled with steel wool as indicated at 13 in Fig. 2. I employ this filter material and in this arrangement for the reason that the hair is considerably coarser than the steel wool. The section of hair at the bottom of the filter is located at a position where most of the sediment drops or sifts through. The steel wool is located at the center and forms the smaller interstices of the two filtering materials, but inasmuch as it is located at center it is in no danger of clogging the eduction or induction pipes and interfering with the flow of oil or the action of the pumps, it being understood that the oil is pumped through the filling material under pressure, there being a pressure of about twenty-five pounds to the square inch. This affords force to send the crude oil, which I prefer to employ, through the small interstices of the filtering material which detaches nearly all the sediment and impurities therefrom.

It will be noted that I introduce the oil at the bottom. This is so that the oil can leave the top without carrying with it sediment or impurities that have collected in the filter. Such sediments and impurities settle toward the bottom and when the oil is taken through from top to bottom, some of the impurities that have collected in the bottom are quite apt to be carried into the eduction pipe.

It will be noted that I have provided a threaded aperture 14 in the side of the lower tubular member into which screws a plug 15. This plug can be removed and access had to the filter for removing the sediment.

The heat-vent 3 is provided with an extending piece 16 at the end where it is bolted to the pipe 2. This extending piece is slotted at 17 and in this slot runs a winged screw 18 that is screwed into the gate 19. This gate serves as a control for the heat-vent 3. By loosening the screw the gate may be raised and lowered as the screw travels in the slot and by tightening the screw upon the extension piece, the gate is supported in any desired position of adjustment. Some of the hot gases of the

interior of the furnace are abstracted through the heat-vent pipe and pass out into the stack 6, enveloping the oil filter 7 and are free to pass out at the open top into the stack. It will readily be understood that by regulating the position of the gate 19 that a constant temperature may be maintained, or any fluctuating temperature that is desired. The intensity of the heat in the stack is at all times indicated by a thermometer 20 on the side of the stack.

The oil is brought to the induction pipe 10 by piping 21, part of which is ordinarily cut out by the cut-out valve 22 and the flow of oil is through the meter branch 23, which carries it through the oil meter 24. I locate the oil meter on the pipe line so that it is operated upon by the oil before the same is heated, as the heated oil has a tendency to interfere with the operation of the meter. The cut-out valve may be opened and the meter branch 23 cut out by closing either of the valves 35 and 36. The cut-out valves may be closed and the induction pipe 10 broken in two, by unscrewing the coupling 39. This allows the dropping of the stack to reach the filter.

The eduction pipe 11 extends away horizontally from the top of the filter, thence turns in a downward direction and drops to a point below the burner 25. In the downward drop of the eduction pipe 11, a cut-off valve 26 for the burner is located. The burner feed pipe 27 joins the eduction pipe 11 at a point below the burner and leads up from below into the burner. This drop of the feed pipes below the burner, so that they feed the burner from below, has a distinct purpose. It will be noted that the coupling 28 that joins the feed pipe 27 with the eduction pipe 11 has a flush valve 29 so that it may be readily flushed. This is to take off any of the impurities or sediment which have escaped the filter and which naturally tend to collect in this loop of the piping below the burner.

The burner 25 is controlled by a valve 30 and fed with the oxygen necessary for combustion by the air pipes 31 and 32, but inasmuch as the construction of the burner and the supply of air to it is not part of this invention, I have not described them.

What I claim is:—

1. An oil feeding system, having in combination, a pipe through which hot air may be taken, a heat vent removably bolted thereto, a stack attached to the heat vent, and a filter surrounded by the stack, the said stack being adapted to be dropped from about the filter by taking out the bolts, substantially as described.

2. An oil feeding system, having in combination, a pipe member through which hot air may be taken, a heat vent bolted thereto, the said pipe member and the vent being cut away at adjacent ends to leave a slot at their juncture, an extending piece attached to the heat vent and provided with a slot, a gate slidable through the opening left at the juncture of the vent and pipe member and adapted to act as a control for the hot air or gases passing therethrough, a winged screw threaded into the gate and slidable in the slot of the extending piece, a stack portion connected with the heat vent, and a filter about which the stack portion engages, substantially as described.

In testimony whereof, I, sign this specification in the presence of two witnesses.

FREDRICK J. NICE.

Witnesses:

STUART C. BARNES,

VIRGINIA C. SPRATT.