

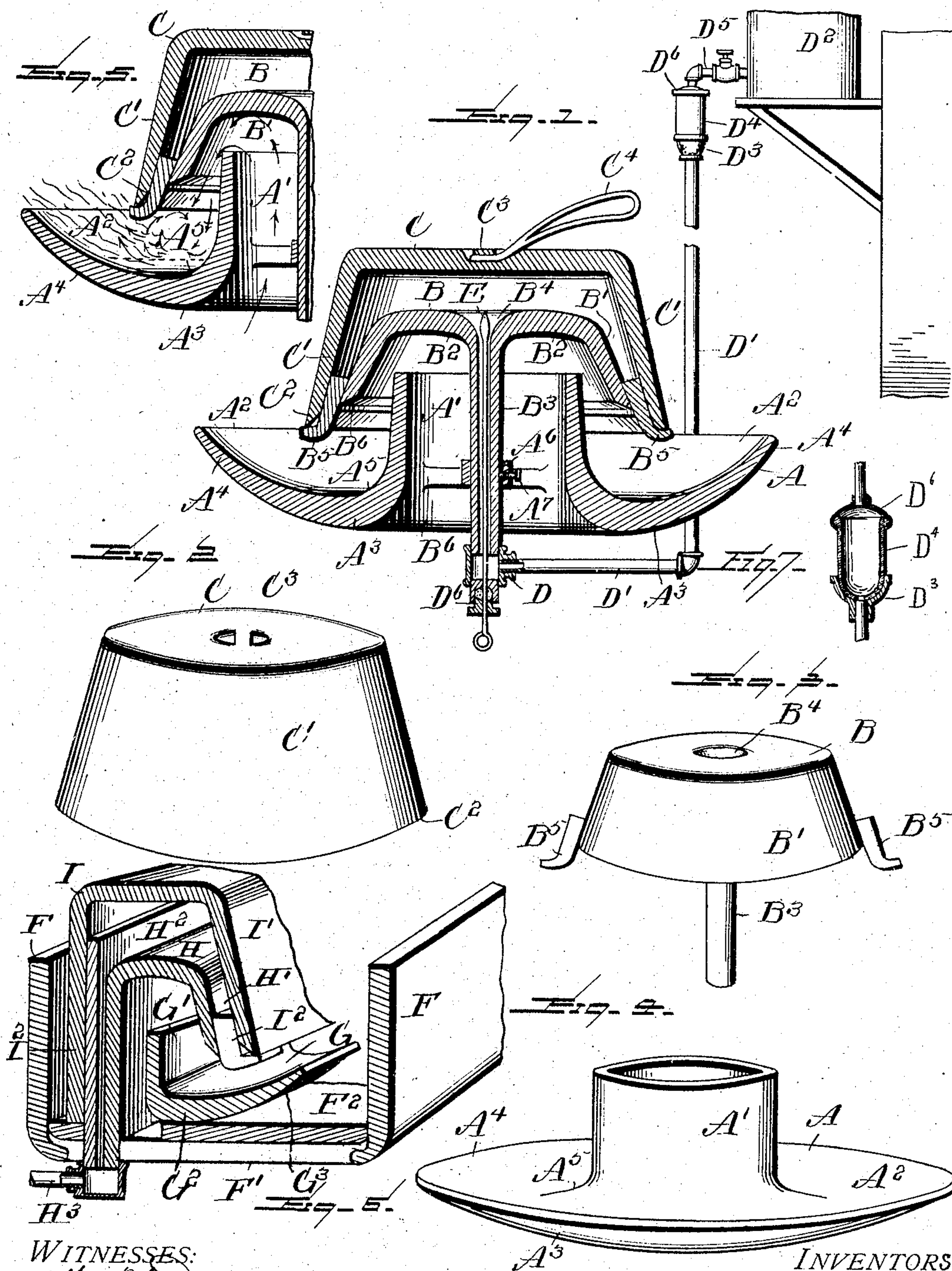
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CRUDE OIL BURNER.

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CRUDE-OIL BURNER.

SPECIFICATION forming part of Letters Patent No. 780,567, dated January 24, 1905.

Application filed May 13, 1902. Serial No. 107,139.

To all whom it may concern:

Be it known that we, THOMAS E. LEWIS, ALBERT J. RAY, and MILEY B. WESSON, citizens of the United States, residing at Fort Worth, in the county of Tarrant, State of Texas, have invented certain new and useful Improvements in Crude-Oil Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a crude-oil burner, and particularly to a device adapted to introduce a column of air at the point of combustion.

The invention has for its object to provide a novel construction of burner in which the oil is heated and partially vaporized, so that in addition to the gas generated a film of oil falls from the lower edge of the oil-tray and is atomized by an air-draft passing across the point of discharge from the oil-tray.

Another object of the invention is to introduce the air-draft in a circuitous path, so as to prevent a direct draft, which would extinguish the flame before the oil would become heated to a vaporizing temperature, and for this purpose an air-eddy is formed in the base-plate or tray beneath the discharge from the oil-tray.

A further object of the invention is to construct this base-plate with a receiving-depression adapted to hold and permit the consumption of semisolid residue from the oil which collects therein.

Other objects and advantages of the invention will be hereinafter set forth and the novel features thereof specifically defined by the appended claims.

In the drawings, Figure 1 represents a vertical section through the burner with a feed attachment thereto; Fig. 2, a detail perspective of the hood or cover for the oil-tray; Fig. 3, a similar view of the oil-tray; Fig. 4, a similar view of the base-plate; Fig. 5, a detail section illustrating the direction of the air-draft; Fig. 6, a sectional perspective showing a modified application of the invention, and Fig. 7 is a detail vertical section of the sight-glass in the feed-pipe.

Like letters of reference refer to like parts in the several figures of the drawings.

The letter A indicates a base-plate formed of any desired material and preferably provided with a vertical wall or collar A', while the lower portion of the plate forms a receiving-tray A², having its deepened inner portion thickened, as at A³, so as not to become so highly heated as the shallower thinner peripheral portion A⁴. Above this base an oil-tray B is located and provided with a downwardly-extending flange B', which overhangs the wall A' of the base-plate, so that an upward draft of air strikes the curved under surface B² of the oil-tray and is thereby deflected downward, so as to prevent a direct outward draft, as will be hereinafter described. The air in passing downward strikes the curved face A⁵ of the tray A² at the base of the wall A', and thereby forms an eddy beneath the lower edge of the oil-tray, so that the flame may be maintained at this point under all conditions without altering the air-draft. The oil-tray is provided with a central feed-pipe B³, having an enlarged opening B⁴ at its upper end and mounted at its lower end in any preferred construction of feed device, one desirable form of which will be hereinafter described. Under many conditions of chimney or flue draft it is desirable to alter the relation of the base-plate and wall A' to the oil-tray B, and this may be effected by any preferred means. For instance, the plate may be supported from the pipe B³ by means of a sleeve A⁶, supported from the base-plate by spider-arms and provided with a set-screw A⁷ for retaining the plate at any desired adjustment.

For the purpose of retaining the vapor generated from the heated oil-tray a hood or cover C is provided and may be supported from the oil-tray by means of lugs B⁵ extending from the lower ends of the flange B' thereof. This hood is provided with a depending wall C', resting upon the lugs B⁵, by which it is spaced from the oil-tray to provide a passage for the gas generated. The lugs firmly support the cover at a fixed dis-

tance from the tray, so as to preserve the equality of the width of the gas-passage, which under the influence of variable heats would have a tendency to warp the walls and leave the passage irregular as to width. The lower edge of the hood is beveled outwardly, as shown at C^2 , so as to form less impinging surface in opposition to the passage of the air-draft outward, although the invention is not in any wise confined to this sharp beveled edge. A similar edge B^6 is provided upon the wall B' of the oil-tray B . For the purpose of removing the cover a recess and cross-bar C^3 are provided upon the upper face thereof and adapted to receive any desired construction of removable handle C^4 , although this feature may be omitted, if convenient.

It will be observed that the lower edge of the hood extends beyond that of the oil-tray, so as to prevent a direct outward draft of the air across the point of discharge for the gas and secure a mixing of the air and gas before reaching the lower edge of the hood.

As illustrating one desirable form of feed device the pipe B^3 from the oil-tray is shown as mounted at its lower end in a coupling D , communicating with a pipe D' , leading from a tank or reservoir D^2 . The upper end of this pipe is provided with a cup D^3 , adapted to have secured therein the lower end of a sight-glass D^4 , the upper portion of which is connected to a stop-cock or valve D^5 , by means of an elastic cap D^6 , so as to form an air-tight connection through which the feed of oil can be observed and which will prevent the escape of any oil should the burner-pipe become clogged and the oil continue to collect therein. The valve D^5 is adapted to be adjusted so as to preclude an overfeed to the burner when turned on full, and the feed may be thereby varied to any desired extent. For the purpose of clearing the pipe B^3 from the oil-tray a rod E is shown extending through said pipe and having its lower end passed through a packing-box D^6 , connected to the coupling D , while at its upper end a flattened flange-head E' is provided, of the diameter of the aperture of the pipe B^3 , so that when rotated within this pipe any obstruction therein will be at once removed.

In Fig. 6 a modified application of the invention is shown in which the burner is of elongated form adapted to be received in a fire-box and has a burning-face at only one side thereof. In this figure the letter F represents the body of a fire-box having grate-bars F' at the lower portion thereof. For the purpose of cutting off the draft from all other points at the rear of the base-plate a cover-plate F^2 is laid upon the grate-bars and the burner rested thereon. Each of the parts of the burner in Fig. 6 is practically one-half of the burner shown in Fig. 1, and the base-plate G is provided with the draft-wall G' at the rear and the tray por-

tion, having the thickened body G^2 and thinner edge G^3 . Above this base-plate an oil-tray H is disposed, with a depending wall H' and a feed-passage H^2 communicating with a feed-pipe H^3 extending to a suitable source of supply. The hood or cover I is spaced from this tray to form a gas-chamber, as hereinbefore described, by any desired means—for instance, lugs I^2 , carried by the flange H' of the tray and upon which the flange I' of the hood rests—while the rear portion of the hood may be supported by a vertical wall I^2 , resting upon the plate F^2 . The action of the several parts is the same as that described in connection with the other figures.

In the operation of the invention it will be seen that the oil from the reservoir passes upward through the feed pipe or passage to the oil-tray, which pipe is located in the air-passage, so as always to be retained in a cool condition to prevent the baking and coking of the residue in the oil within this pipe, which will occur when the pipe becomes heated to any extent. The oil-tray is heated by the flame at its lower portion, so that the oil is partially vaporized and the gas formed in the chamber between the tray and hood passes downward and escapes at the lower portions thereof, where it is ignited. Certain portions of the oil do not readily vaporize under the heat here present, and they fall from the depending flange of the oil-tray in a film or layer through which the current of air is passed at the point of ignition. The vertical wall at one side of the base-plate forms an upward draft-passage and is the only draft used in connection with the burner, it being desirable to cut off all other draft when located in a grate-box by means of a plate, as shown in Fig. 6. At the upper end of this air-passage the draft is deflected downward by the curved under face of the oil-tray and passes between the depending wall of this tray and the wall of the base-plate. At the base of the wall upon the plate the air strikes the curved bottom thereof and is deflected into an eddy, thus preventing a direct outward blast, which will extinguish the flame when the stove is first lighted and will require supplemental means for heating the oil-tray to a sufficient extent to vaporize the oil thereon. This air-draft passes through the falling film of oil and residue, atomizing the same and carrying it into the flame at the point of ignition, which is at the lower outlet from the gas-chamber between the tray and cover. The solid residue or asphaltum falls into the tray formed by the base-plate, and the thicker inner portion of said tray does not become sufficiently highly heated to bake or coke this solid matter, but does retain it in a semi-fluid condition, so that it flows outward to the thinner edge of the plate, upon which it collects in a very thin layer by capillary

attraction. This thinner edge is in contact with the flame and becomes highly heated, so that the residue in the thin layer is quickly consumed and other material flows to the outer edge of the plate, thus continuing the consumption of the semisolid matter of the oil. The base-plate may be adjusted relatively to the oil-tray for the purpose of varying the relation of the parts under different conditions of draft, and the feed-pipe to this draft may be cleared of any obstruction by means of a rod therein, which may be reciprocated and rotated within the pipe in order to clean out any solid matter therein. It will be noted that the lugs carried by the depending flange of the tray space the closed hood or cover at a fixed distance therefrom, thereby maintaining a gas-passage between the flanges of the tray and cover of a definite capacity and preventing the warping which would otherwise occur between parts heated to different degrees. The hood or cover also presents an inclosed chamber within which the oil is vaporized, and the gas therein is not subjected to contact with the air until it emerges at the point of ignition, so that the gas is ejected by reason of its expansion caused by the heat of the tray. It will be noted that the location of the oil-tray above the air-inlet passage and the use of the eddy-wall upon the base-plate obviate all of the difficulties incident to a direct draft through a burner, which besides extinguishing the flame, if a small one, carries the flame outward away from the oil-tray, thus defeating the very important object of heating this tray by retaining the flame at the base thereof. It is important that there should be an ample supply of air; but it is essential that this air should not strike the flame in a direct draft.

It will be obvious that the form or configuration of the burner may be changed in numerous particulars, as well as the construction of the different detail features thereof, without departing from the spirit of the invention as defined by the appended claims.

Having described our invention and set forth its merits, what we claim, and desire to secure by Letters Patent, is—

1. In an oil-burner, a base-plate having a recessed tray provided with a concave face and a straight wall at one edge thereof, said face decreasing in thickness from its inner portion outward, and an oil-tray having a depending discharge-flange above said concave face; substantially as specified.

2. In an oil-burner, a concave base-plate having its lowest portion thickened and its higher outer edge portion tapered thinner whereby the parts of the plate may become heated to different degrees; substantially as specified.

3. In an oil-burner, a base-plate having a vertically-disposed wall and air-inlet at its inner face and a tray extending outwardly there-

from, an oil-tray disposed above said wall and having a depending flange spaced substantially parallel thereto, lugs extending downward from said depending flange, and a hood or cover supported upon said lugs and extending below said flange; substantially as specified.

4. In an oil-burner, a base-plate having a vertically-disposed wall and air-inlet at its inner face and a curved tray extending outwardly therefrom, an oil-tray disposed above said wall and having a central enlarged opening and a feed-pipe depending therefrom, a depending flange upon said tray extending substantially parallel with said wall and having a concave face above the wall, lugs extending from said depending flange, a hood or cover supported upon said lugs and extending below said flange, and a supply-pipe communicating with said feed-pipe beneath the burner; substantially as specified.

5. In an oil-burner, a base-plate having a vertically-disposed wall and air-inlet at its inner face and a curved tray extending outwardly therefrom, an oil-tray disposed above said wall and having a depending flange extending substantially parallel therewith to provide an air-passage between said wall and flange, lugs extending from said depending flange, a hood or cover supported upon said lugs, a depending feed-pipe from said oil-tray, a supply-pipe communicating therewith beneath the burner, and a sleeve supported from said base-plate and adjustable on said feed-pipe to vary the vertical adjustment of the base-plate relative to the oil-tray; substantially as specified.

6. In an oil-burner, a base-plate having a vertically-disposed wall and air-inlet at its inner face and a curved tray extending outwardly therefrom, an oil-tray disposed above said wall and having a depending flange extending substantially parallel therewith to provide an air-passage between said wall and flange, lugs extending from said depending flange, a hood or cover supported upon said lugs, a depending feed-pipe from said oil-tray, a supply-pipe communicating therewith beneath the burner, a sleeve supported from said base-plate and adjustable on said feed-pipe to vary the vertical adjustment of the base-plate relative to the oil-tray, and a clearer-rod extending through said feed-pipe and projecting from the supply-pipe, and a packing around said rod; substantially as specified.

7. In an oil-burner, a burning device, a reservoir, a supply-pipe communicating between the same, a stop-cock from said reservoir, a sight-glass removably connected to said cock and supply-pipe, an elastic cap surrounding the discharge-pipe from said cock and the upper portion of said glass, and a cup upon the supply-pipe to receive the lower portion of said glass; substantially as specified.

8. In an oil-burner, a base-plate having a

raised inner wall and a curved face at the base thereof adapted to produce an eddy in the air passing thereover, a service-pipe, an oil-tray above the wall of said plate and having a depending feed connection supported from said pipe, a hood or cover spaced from said tray to form a gas-passage discharging downward toward the curved face of the plate and into the path of the air-draft, and means for adjustably mounting said base-plate upon the feed connection for movement toward and from the under face of said tray; substantially as specified.

9. In an oil-burner, a concave annular base-plate having a central raised wall to form a draft - passage, a circular oil - tray disposed above said wall and having a central opening and a depending flange extending concentric to said wall, a circular hood or cover spaced from

said tray and outwardly beveled at its lower edge, a feed-pipe for the opening in said tray extending within the wall of said base-plate, means for vertically adjusting said base-plate upon said pipe, a reservoir, a pipe connection extending therefrom to the feed-pipe, lugs depending from the periphery of said tray for spacing the hood therefrom, and means carried by said hood to receive a lifting device; substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

THOMAS E. LEWIS.
ALBERT J. RAY.
MILEY B. WESSON.

Witnesses:

S. SEATON,
PAUL KELLER.