No. 797,249. PATENTED AUG. 15, 1905.

J. C. ZIEGLER.

CRUDE OIL BURNER.

APPLICATION FILED MAY 6, 1905.

Fig. 1

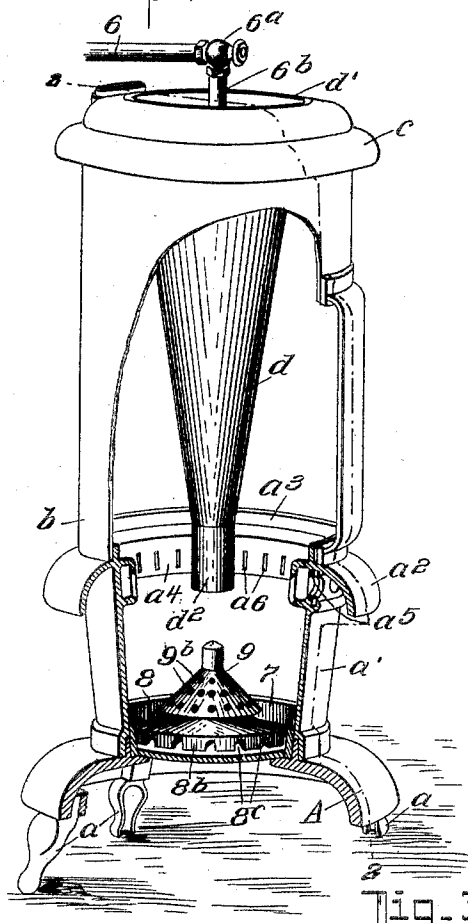


Fig. 2.

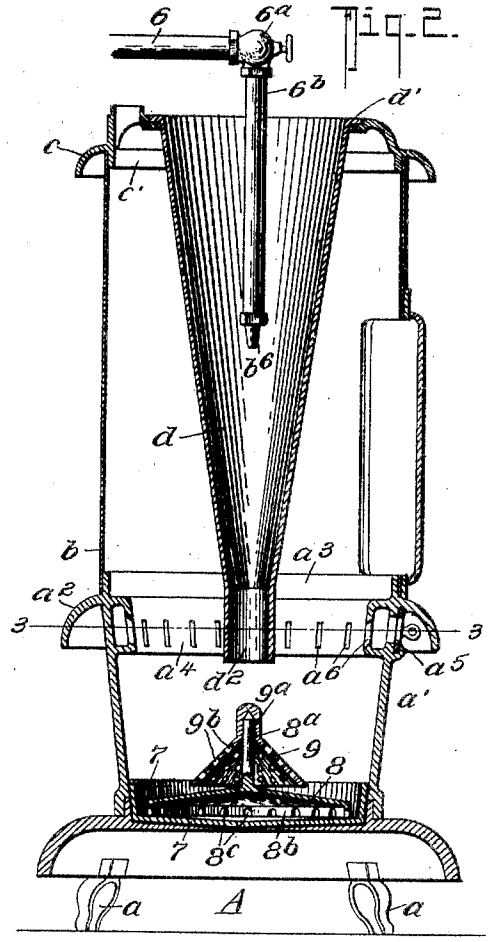


Fig. 3.

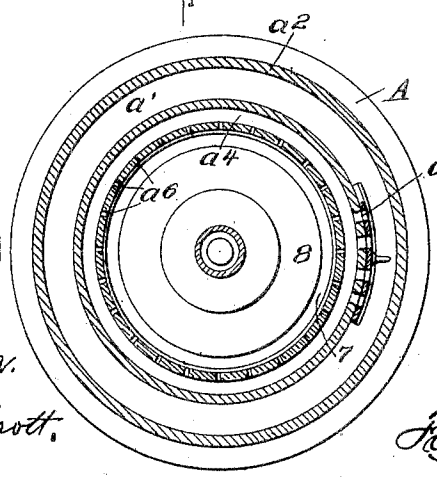


Fig. 4.

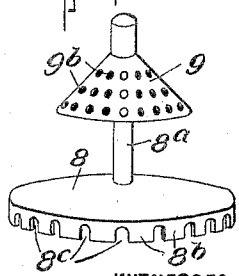
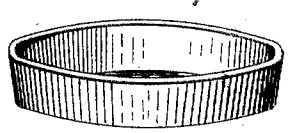


Fig. 5.



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CRUDE-OIL BURNER.

No. 797,249. Specification of Letters Patent. Patented Aug. 15, 1905.

Application filed May 6, 1905. Serial No. 259,205.

To all whom it may concern:

Be it known that I, JOHN C. ZIEGLER, residing at Seymour, in the county of Baylor and State of Texas, have invented a new and Improved Crude-Oil Burner, of which the following is a specification.

My invention relates to improvements in that type of burners or stoves especially designed for burning crude oil in its natural unrefined state as fuel; and it primarily has for its object to provide an improved construction of crude-oil-burning means of the general character stated of a simple, economical, and effective nature in which the oil is perfectly and under an economical feed positively consumed without producing smoke or odor.

In its generic nature my invention comprehends an improved type of crude-oil burner devices adapted for use with the common type of heating-stoves that use coal or wood for fuel without materially changing their general arrangement, and the said burner devices are designed for effecting a quick conversion of the oil into a vaporous fuel, whereby the maximum fuel products of the oil is obtained and the residuum or non-convertible elements of the oil is collected, so that the same may be readily removed.

In its more complete form my invention includes, in combination with a stove having a vertical heating drum or chamber, a conically-shaped air-funnel supported within the heating-drum and whose upper or wide end forms a closure means for the upper part of the heating-chamber of the drum and whose lower or contracted end leads the oil under a strong blast against the burner devices beneath it and which acts as a means for thoroughly heating the air as it is fed against the burner and also as a flame-spreader and in such manner that none but heated air is fed to the burner.

My invention also embodies a special construction of burner having its parts so designed that the oil fed down through the funnel under gravity or forced feed is delivered under great force against an upper or target member of the burner, whereby to spray the lighter particles so they instantly become converted into gas and are consumed, while the heavier particles descend over the lower part of the target member and are further converted into gas and consumed as the heavy non-convertible substance passes down onto the separating-cone member and into the pan.

My invention also provides such a type of gaseous-oil burner which acts on the crude oil in such manner that the lighter or floatable solids that detach themselves during the process of converting the oil into gas will be drawn up into the flue as the heavier solids attach to the upper perforated cone, from whence they may be removed after extinguishing the fire.

In its more subordinate features my invention consists in certain details of construction and peculiar combination of parts, all of which will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a crude-oil-burning stove constructed in accordance with my invention, portions being broken away to clearly illustrate the general arrangement of the internal parts. Fig. 2 is a vertical section of the same, taken practically on the line 2 2 of Fig. 1. Fig. 3 is a horizontal section taken on the line 3 3 on Fig. 2. Fig. 4 is a view which illustrates the perforated target-cone and the separating-cone member of the burner detached, and Fig. 5 is a perspective view of the collecting-pan detached.

In the accompanying drawings I have illustrated the burner, the pan, and the combined air-funnel and radiator and oil-leading member as adapted for and combined with the ordinary type of coal or wood heating-stove having a sheet-iron drum mounted on the combustion-chamber or fire-box; but I desire it understood that the said parts of my invention without materially changing may be readily adapted for other types of heaters. The type of heater shown I have found as permitting the most economical and effective application of my invention.

The base A of the stove is of cast metal, suitably mounted on the legs a a and having an inverted tapering fire-pot a', closed tight at its bottom, whose upper end has an annular ornamental rim a^2, provided with an annular seat a^3 to receive the bottom of the sheet-iron drum b, and the said upper end of the pot a has the annular hot-air-blast chamber a^4, fed through a valved opening or slide-damper a^5 in the door side of the drum in the usual manner, as best shown in Fig. 3, which also shows the slots a^6 in the chamber a^4 that lead the blast in streams or jets radially over the burner.

The drum b in my arrangement of oil-burner is closed by the ornamental annular cast rim c, having a pendent flange c', that slips down inside the top of the drum, and the said rim c

has an opening nearly the full diameter of the rim, in which is pendently held a cone-shaped funnel d, whose upper or large end has an annular flange d' to rest on the rim c, as shown.

The lower or small end of the funnel c terminates in a short restricted straight nozzle d^2, that extends in a plane slightly below the annular air ring or chamber on the top of the fire-pot and to a point in practice about three inches above the upper or target member of the burner devices, the reason for which will be presently explained.

6 designates the oil-feed pipe that connects with the storage-tank or other source of supply and which joins with a valve 6^a, with which the pendent or discharge pipe 6^b connects and which extends down into the funnel d to a point about midway its length and ends with an ejector-nozzle b^6.

The burner device proper comprises, essentially, but three parts—the pan 7, of a size to freely fit on the bottom of the fire-pot and slightly dished to convey the flow therein to the center, a hollow conical casting 8, having its edge terminating in pendent flange 8^b, notched, as at 8^c, that detachably seats in the pan and has a central upwardly-projecting stem 8^a, and a second cone-shaped member 9, of much less diameter than that of the casting 8 and which has a vertical hub having a socket 9^a in its under side to rest on the stem 8^a and to hold the "target-cone" elevated above the casting 8. The target-cone 9 has a series of apertures 9^b, and said target forms the spraying-cone, as it is directly against the upper face that the mixed air and oil is forced under pressure from the funnel d.

The manner in which my invention operates and the advantages of the same are best explained as follows: To start the fire, saturated waste is placed under the target-cone 9 and ignited to effect the preliminary heating of the burner members 8 and 9. As soon as the target-cone is heated a small quantity of oil is allowed to drop onto the target, which is increased until the target is at the maximum incandescence. The damper a^5 in the annular hot-air chamber a^4 is opened or closed as the flow of oil is increased or diminished—*i. e.*, when the flow of oil is slight and no smoke is produced during its combustion if the damper a^5 is closed then the said damper a^5 is allowed to remain closed, but should the flow of oil be too great to be fully burned with only the air fed in through the funnel d smoke will be produced, and to prevent this smoke production the damper a^5 is opened just sufficient to feed in the additional amount of air required to fully consume the oil without production of smoke. The draft down the funnel d and up the chimney-flue (and in through the damper a^5 and up the chimney-flue when the damper is open) will be sufficiently strong to prevent the escape of combustible gases from the stove, and by providing the funnel d, as shown, the fresh air fed in therethrough will be concentrated directly on the target-cone. Since in connection with the flue the intense heat in the fire-pot creates a powerful draft down the funnel and heats the funnel, it follows that the air-blast drawn through the contracted end of the funnel creates a strong suction on the discharge or ejector end of the oil-pipe, and thus materially aids in keeping up a proper feed of the oil and also in preventing the clogging of the nozzle of the pipe, which might occur under ordinary gravity-feed of the oil therefrom. The oil and air mixing in the lower or contracted end of the funnel becomes at once thoroughly heated and converted into a gaseous fluid which discharges under great force against the target portion 9^a of the target-cone 9, and such impact of the mixed air and vaporous fluid serves to thoroughly spray the lighter particles of the fluid, and thus cause them to instantly ignite as they are thus diffused, thereby creating, as it were, a maximum spreading of the flame, which under the force of the whirling air-current, caused by the influx of air into the closed fire-pot from the funnel, as also from the annular air-space on the fire-pot, and the passing of the up-current through the perforations in the target-cone, creates a heat intense enough to at once convert and consume all but the incombustible particles of the oil and create a powerful heat within the drum, which as it radiates externally of the drum also keeps the funnel to such heat that will thoroughly heat the incoming air before it intermixes with the gas, a great desideratum in this type of heaters. By providing the funnel member d and making it of cone shape, with the larger diameter at the open or top end in communication with the atmosphere and the smaller diameter adjacent the target-cone, the heat from the internal surface of the funnel passes off into the room, thereby greatly increasing the heating capacity of this type of stove. As the heavier convertible particles of the oil pass over the lower edge of the perforated face of the target-cone 9 they become consumed, thus effecting a positive consumption of all the convertible parts of the oil without smoke or odor, and the non-convertible parts, such as asphaltum and the like, drop off the target-cone 9 onto the lower cone 8, which for convenience of description I shall term the "separating-cone." The non-convertible parts which fall on the separating-cone 8 flow off the same and down underneath such cone through the apertures 8^c into the collecting-pan 7. As the non-convertible parts of the oil are subjected to a powerful heat in a restricted space they become baked, baking in the pan 7, from which they can be readily separated when the said parts are cooled by simply removing the several parts through

the stove-door and cleaning them with any suitable instrument.

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

1. A crude-oil burner comprising a stove-casing and a closed fire-pot, an imperforated conical separator detachably mounted on the bottom of the fire-pot, an elevated perforated target-cone centrally supported above said conical separator, a cone-shaped funnel member pivotally supported through the top of the stove-casing with its small end held to discharge centrally against the target-cone, and an oil-dropper that discharges into the funnel substantially as shown and described.

2. A crude-oil burner, comprising in combination with the stove-casing having a closed fire-pot, of an imperforated conical separator mounted on the bottom of the fire-pot, a second conical and apertured member supported at its center over the separator, and a combined air and oil receiver mounted in the top of the stove that discharges directly against the second conical member, substantially as shown and described.

3. The combination with a stove-casing and an inverted-funnel-shaped air-feeder depending within the body of the stove for contracting the air column as the air passes into the stove-body and serving to reduce the space at the upper end of the body, and a burner within the stove-body below the air-feeder, said stove-body being provided at its upper portion with an offtake, and means for feeding oil to the burner through the air-feeder, substantially as shown and described.

4. A crude-oil burner comprising an imperforated cone-shaped separator having a vertical stem at its apex, a target-cone of less diameter than the separator-cone detachably supported on the aforesaid vertical stem and including a target portion, and means supportable from the top of the stove for feeding mixed air and oil directly against the target portion of the target-cone, substantially as shown and described.

5. The combination with a stove-casing having a closed fire-pot and an opening in the top, of a pan detachably supported in the fire-pot, a conical separator supported in the pan, a perforated target-cone detachably supported centrally over the separator, and a means for conveying a combined air-blast and oil-feed through the top of the stove-casing directly against the target portion of the target-cone, substantially as shown and described.

6. The combination with the closed fire-box having a slotted hot-air-blast ring at its upper edge, a casing mounted on the fire-box, a funnel-shaped air-receiver detachably supported from the open top of the stove-casing, and the oil-feed pipe that discharges into the funnel-shaped receiver, of the pan detachably mounted in the bottom of the fire-box, the cone-shaped separator 8 loosely mounted in the pan, said separator having a central vertical stem, the target-cone 9 having a series of apertures and a central socket whereby to support it on the stem of the member 8, said target being in line of the discharge end of the funnel-shaped receiver.

7. A crude-oil burner comprising a cone-shaped separator having a vertical stem at its apex and a downwardly-projecting peripheral flange at its base, said flange having peripheral apertures, a target-cone having a target portion and of less diameter than the cone-shaped separator detachably supported at its apex on the aforesaid vertical stem and means for feeding mixed air and oil downwardly directly on the top of the target portion of the target-cone substantially as shown and described.

8. The combination with a stove-casing having a closed fire-pot and an opening in the top, of a pan detachably supported in the fire-pot, a conical separator supported in the pan, a perforated cone-shaped target detachably supported at its apex centrally over the separator, and a means for conveying a combined air-blast and oil-feed through the top of the stove-casing and directly against the target, substantially as shown and described.

JOHN C. ZIEGLER.

Witnesses:
JOHN L. FLETCHER,
JOHN T. SCHROTT.