954,959.

A. J. HENNESSEY.

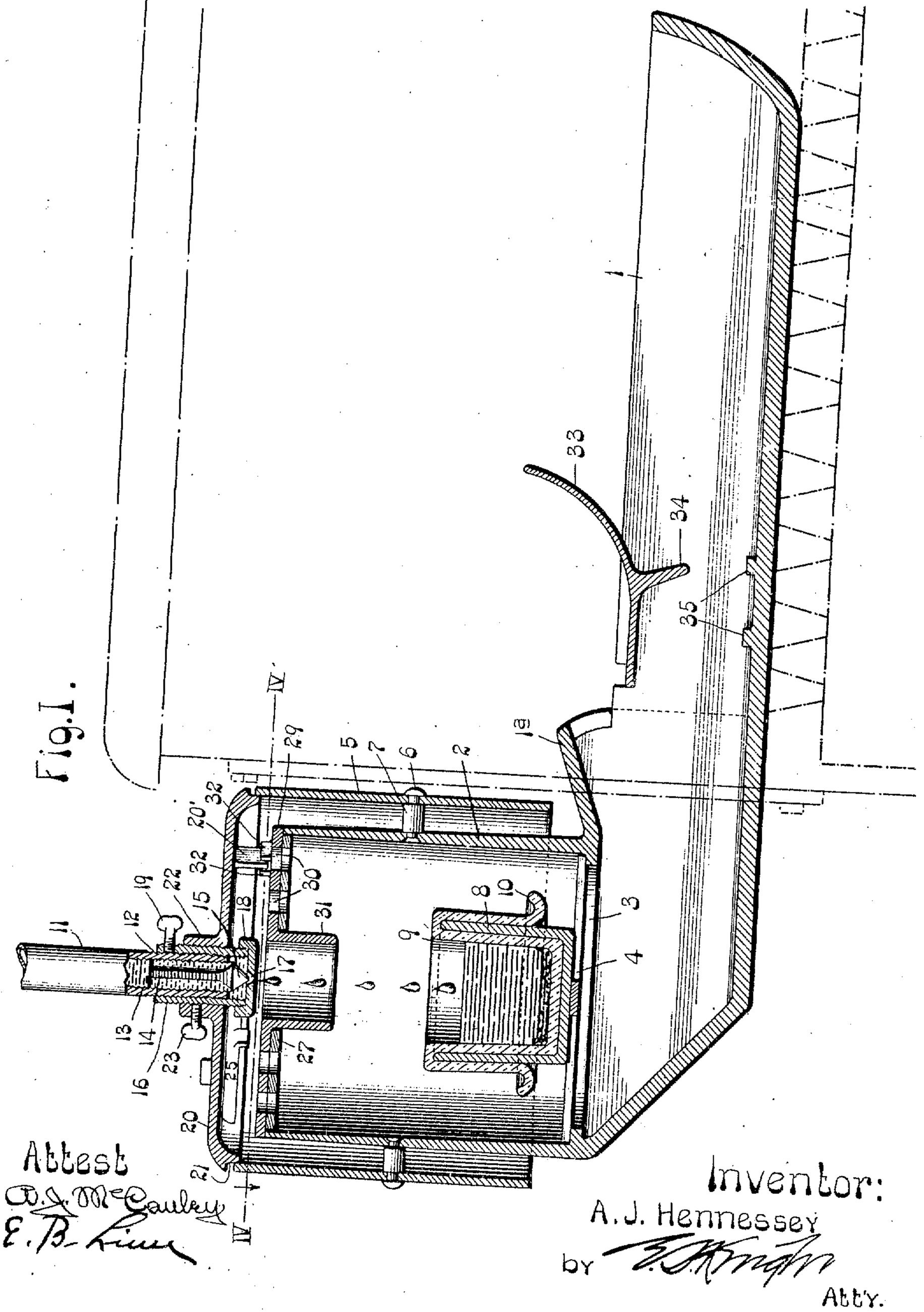
CRUDE OIL BURNER.

APPLICATION FILED NOV. 22, 1909.

Patented Apr. 12, 1910.

2 SHEETS—SHEET 1.

Fig. 1.



Attest

W. J. McCauley

E. B. Lincoln

Inventor:

A. J. Hennessey

by E. G. Siggers

Atty.

954,959.

A. J. HENNESSEY.

CRUDE OIL BURNER.

APPLICATION FILED NOV. 22, 1909.

Patented Apr. 12, 1910.

2 SHEETS—SHEET 2.

Fig. II.

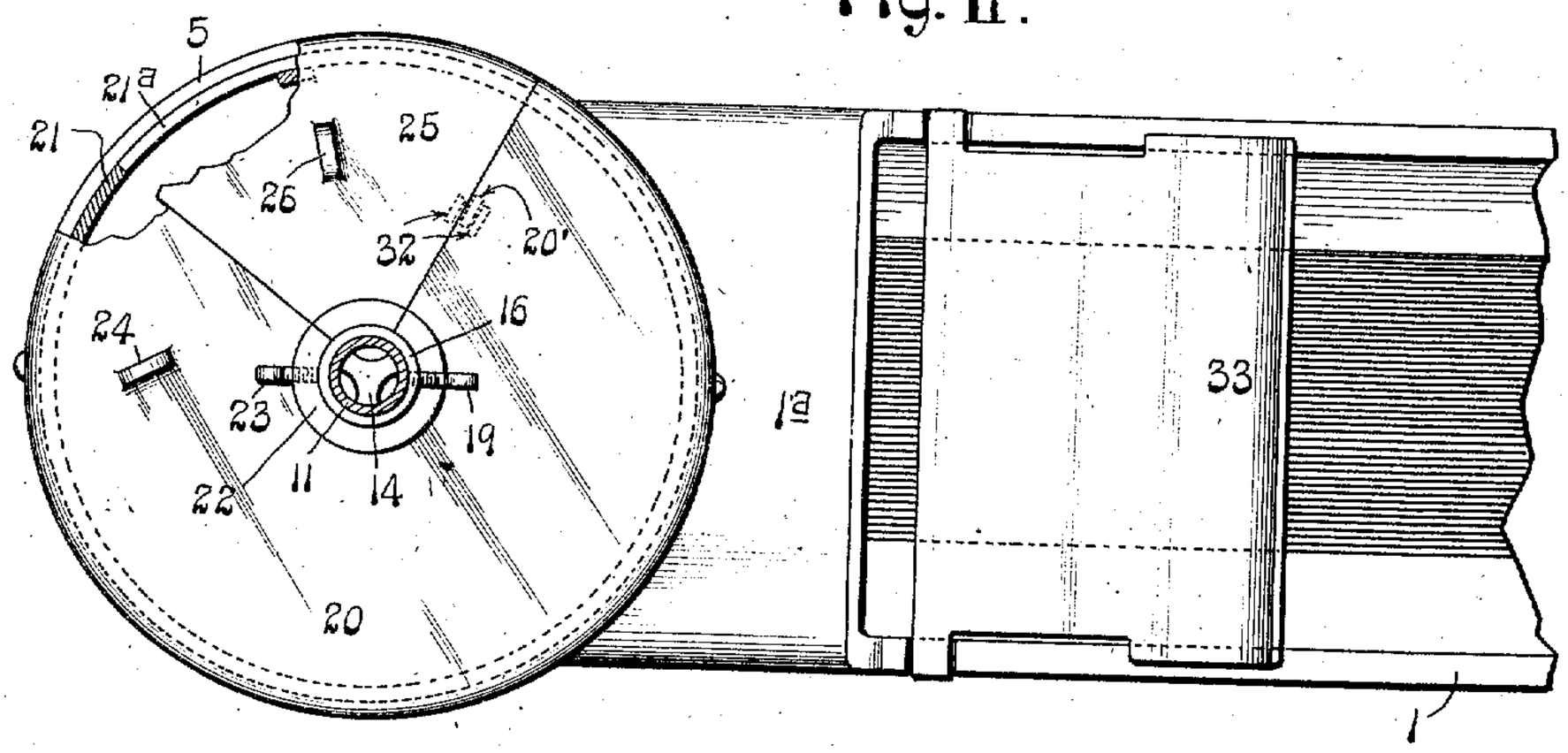


Fig. III.

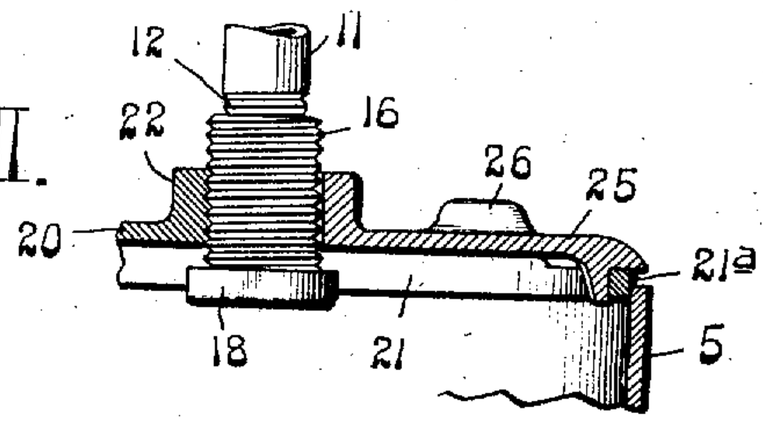
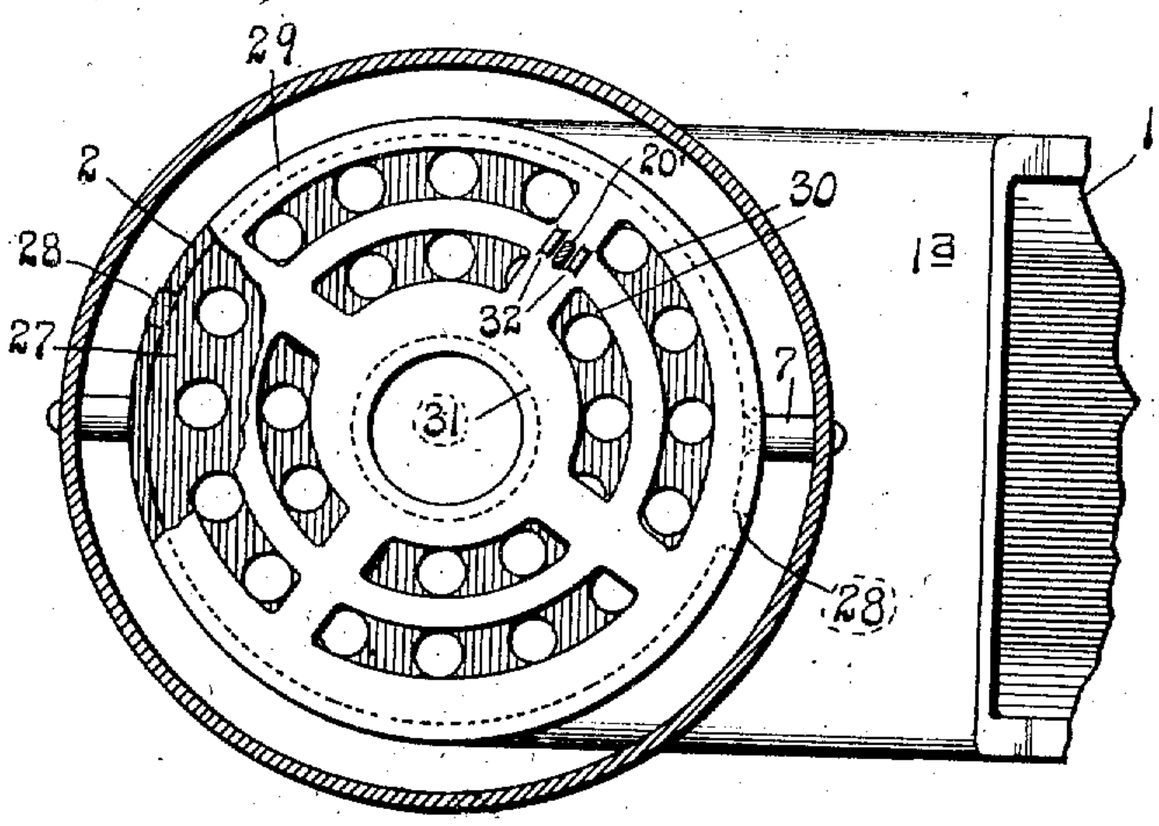


Fig. IV.



Attest

A. J. McCauley

E. B. Lum

Inventor:

A. J. Hennessey

by E. G. Siggers

Atty.

UNITED STATES PATENT OFFICE.

ARTHUR J. HENNESSEY, OF ST. LOUIS, MISSOURI.

CRUDE-OIL BURNER.

954,959. Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed November 22, 1909. Serial No. 529,204.

To all whom it may concern:

Be it known that I, ARTHUR J. HENNESSEY, a citizen of the United States of America, residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Crude-Oil Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a crude oil burner more particularly intended for use in cooking stoves, ranges, or heating stoves, but which may also be used in connection with various other heating apparatuses.

Figure I is a vertical longitudinal section taken through my burner, illustrated as it appears in use in a cooking stove. Fig. II is a top or plan view of the burner shown partly broken out. Fig. III is a vertical section of the top of the burner at the location of the detachable cap member. Fig. IV is a horizontal section taken on the line IV—IV, Fig. I, with a portion of the movable damper plate beneath said line broken out.

In the accompanying drawings:—1 designates a pan that is adapted to be placed within the stove, or other device, to which heat is to be supplied in the use of my burner. The pan is intended to be only partially located within the fire box of the stove, and is surmounted at its outer end by an inner vertical housing member 2, preferably of cylindrical shape and which has communication with the pan at its lower end, due to the presence of an opening 3. At the location of the opening 3 is a grate 4.

5 is an outer shell surrounding the inner housing member 2 and preferably supported by attachment to said housing member through the medium of bolts 6. The shell 5 is distanced from the inner housing member to provide an annular air passageway between these members through which air may ascend, the separation of the members being preferably accomplished by distance sleeves 7 surrounding the bolts 6 and located between the inner housing and the surrounding shell.

The grate 4 at the bottom of the inner housing serves as a support for an oil receptacle which preferably comprises a main pot 8 that may be of iron, or other suitable material, and a lining 9, of some less expensive material than the main pot, and which is non-combustible, the material used in making the lining being preferably clay. The lining 9 comprises a vessel portion that is seated within the main pot and extends across the top of the main pot and then downwardly at its exterior, terminating exterior of the pot and at the bottom of the outer portion of the lining in a trap 10 which is adapted to serve as a receiver for the overflow of oil residue resulting from burning of the crude oil delivered to the pot of the burner.

The provision of the inexpensive lining 9 in an oil receiver of a crude oil burner, as herein contemplated, and the provision in connection with this inexpensive lining of a trap by which the residue from the oil may be caught is an important item in a crude oil burner, for the reason that such residue, which is not under ordinary conditions combustible, is contained in crude oil to such an extent that the oil receiver becomes very rapidly filled with the residue so that there is, after short use of the burner, no adequate room in the receiver for the combustible elements of the oil, unless the residue be removed from the oil receiver by a laborious process; and by reason of the further fact that, in the absence of a trap to catch the overflowing residue, it descends in the burner and accumulates upon the burner parts beneath the oil receiver to such extent as to cause early impediment to the flow of hot air currents from the oil receiver in which combustion takes place to the point at which heat from the products of combustion is to be utilized. By providing my lining 9, which is removably fitted to the main oil pot, I provide an oil receptacle in connection with the main oil pot which serves to catch the overflowing residue of oil and which, being of an inexpensive nature, may be discarded and replaced by a new lining whenever it becomes unfit for service due to accumulation of oil residue therein, or caught in its trap.

11 designates an oil conducting pipe leading to my burner and which terminates in a vertical position above the point at which the oil receiver in the burner is located.

This oil conducting pipe is provided at its termination with an external screw thread 12 and an internal screw thread 13, the latter of which is engaged by a grooved valve stem 14 located within the oil conducting pipe and terminating at its lower end in a conical valve 15.

16 is a regulator sleeve surrounding the conducting pipe 11 and provided with an internal screw thread that engages the external screw thread 12 of said pipe, in order that said sleeve may be adjusted vertically upon the conducting pipe to regulate the degree of flow of oil from the conducting pipe 11 through an orifice 17 in a closure member 18 carried by the regulator sleeve and which orifice is adapted to be controlled by the valve 15. The regulator sleeve 16 is adapted to be held in a fixed position by a set screw 19 mounted in said sleeve and extending therethrough into engagement with the conducting pipe 11.

20 designates a cap of segmental shape surmounting the shell 5 and the inner housing 2 and partially surrounding the oil conducting pipe 11 and the regulator sleeve 16. This cap is provided at its bottom and near its periphery with a flange 21 which is loosely seated within the outer shell 5, thereby permitting rotation of the cap for the performance of an office as will hereinafter appear. The cap is provided with a central collar 22, of segmental shape, and which has screw threaded engagement with the regulator sleeve 16, around which the cap is adapted to turn.

23 is a set screw mounted in the collar 22 and adapted to bear against the regulator sleeve 16 to hold the cap from movement after it has been adjusted to a position in which it is desired to maintain it.

24 is a finger piece carried by the cap 20 and by which rotation may be readily imparted to said cap.

25 is a removable cap piece, provided with a finger piece 26, and which serves to close the gap in the segment shaped cap 20. This cap piece is detachably supported in part by the regulator sleeve 16, (see Fig. III), and in part by a continuation 21^a of the flange of the cap 20 at the location of the gap in said cap, and said cap by being detachable permits ready access to the interior of the inner shell 2, in order that oil present in the oil receiver may be ignited.

27 designates a perforated air admission plate located at the upper end of the inner housing 2 and immovably supported by said housing, the support for said plate being preferably provided by furnishing the plate with lips 28, (see Fig. IV), and notching the upper end of the inner housing to receive these lips.

29 is an air regulator plate loosely seated on the air admission plate 27, and which is provided with segmental shaped slots 30 adapted to register with the perforations in the air admission plate. The air regulator plate is provided with a depending tubular leg 31, the passageway through which is located beneath the oil conducting pipe 11 and above the oil receiver within the inner housing 2. The tubular leg just referred to is offset from the center of the air regulator plate and extends through a central opening in the air admission plate 27, so that the axis of said air regulator plate is eccentrically located relative to the center of the air regulator plate. As a consequence, when the air regulator plate is rotated above the air admission plate, the imperforate portions of the air regulator plate are so changed in positions as to provide for the perforations in the air admission plate being at one time mainly in an open condition, and at another time partially closed to a greater or less degree by the imperforate portions of the air regulator plate. The quantity of air rising between the inner housing 2 and the outer shell 5, and which gains access to the interior of the inner housing within which the crude oil is burned, may be governed according to the adjustment of the air regulator plate 29. It is highly desirable to regulate the admission of air into the combustion chamber, which it will be appreciated is the chamber within the housing 2, and to regulate the flow of oil into said combustion chamber in harmony with the admission of air, in order that proper combustion may take place. I, therefore, provide for the adjustment of the air regulator plate 28 through the medium of the cap 20, which is also adapted to actuate the regulator sleeve 16 that controls the flow of oil from the pipe 11. With this in view, the cap 20 is placed in engagement with the air regulator plate 29 by suitable means, such as that shown in the drawings, and which comprises a finger 20′ extending downwardly from the cap 20 and arranged between a pair of lugs 32 projecting upwardly from the air regulator. It will be readily understood that when the set screw 19 is retracted to a sufficient degree to permit rotation of the regulator sleeve 16 on the oil conducting pipe 11, while the set screw 23 is set to hold the cap 20 and the regulator sleeve 16 in firm engagement with each other, the cap 20 will, upon being rotated, serve to actuate not only the air regulator plate 29, but also the oil controlling regulator sleeve 16 in such manner that, if there is a small amount of oil being delivered to the combustion chamber of the burner, the passageways through which air may enter into the combustion chamber will be restricted, commensurate with the quantity of oil being delivered to the combustion chamber; while, if the flow

of oil to the combustion chamber is increased, the air regulator plate will be so adjusted as to provide for the admission of a greater supply of air to the combustion chamber.

In the practical use of my crude oil burner, the oil delivered into the oil receiver may be ignited upon the removal of the cap piece 25 and the dropping of a lighted match or taper into the oil receiver through the opening uncovered by the removal of said cap piece and through the tubular leg 17 of the air regulator plate 29. As the oil burns, the air heated in the combustion chamber descends therefrom into the pan 1 to supply heat to the stove, or other heating apparatus with which the burner is associated.

It is highly desirable to prevent the hot air and products of combustion entering into the pan 1 from passing in rearward course within the heating apparatus after they have entered the pan, in order that they may not escape rapidly through the draft opening in the heating apparatus, with consequent lessening of the supply of heat in the heating apparatus. I, therefore, locate over the end of the pan nearest the combustion chamber a hood 1^a beneath which the hot air and products of combustion pass after entering into the pan, and provide a deflector plate 33, which is supported by the side walls of the pan and located back of said hood, this deflector plate being provided with an upwardly extending rear portion that serves to retard the flow of the current of hot air as it passes upwardly after flowing beneath the hood 1^a. A certain percentage of the hot air is therefore caused to ascend in the chamber of the heating apparatus at its end nearest the combustion chamber of the burner, while the remainder passes beneath the deflector plate 33; and, in so doing, ascends from the pan in the chamber to which heat is supplied from the burner. The deflector plate 33 is provided with a downwardly extending baffle 34, which acts to restrict the passage of currents of hot air and products of combustion in a rearward course in the pan 1 and cause them to be partially combined in front of said baffle in order that the oil that may descend into the end of the pan beneath the combustion chamber of the burner may be consumed in this end of the pan, which is the one subject to the greatest degree of heat, due to the proximity of the combustion chamber. As a consequence, the oil descending into the pan is completely consumed at the entrance end of the chamber in the heating apparatus with which the burner is used and the benefit of the heat derived from the combustion of oil at the point named is, therefore, received by the entire chamber in the heating apparatus. With the object in view of enhancing the combustion of the oil in the pan 1, at the point to which reference has been made, I locate in the bottom of the pan one or more transverse ribs 35, (see Fig. I,) which serve to restrain the flow of oil in a rearward course, and retain it at the forward end of the pan, where it will be subjected to sufficient heat for combustion thereof.

I wish to direct attention to the fact that by surrounding the inner housing 2 of my burner by the outer shell 5, between which and the inner housing the air for the support of combustion in the combustion chamber passes, and the further fact that these members are located above the outer end of the pan 1, in which combustion also takes place, there is constantly a high degree of heat in the air passageway leading to the combustion chamber and the air is highly heated in traversing this passageway and before it reaches the combustion chamber. It is apparent that this highly heated air on entering the combustion chamber greatly enhances the combustion in said chamber, as compared with the admission of air that has not been subjected to a high degree of heat.

I claim:

1. In an oil burner, a housing having a combustion chamber therein, an oil delivery pipe for supplying oil to said combustion chamber, a valve supported by said pipe, a regulator sleeve rotatably fitted to said pipe and having an orifice adapted to be moved relative to said valve, and a cap surmounting said housing in engagement with said regulator sleeve.

2. In an oil burner, a housing having a combustion chamber therein, an oil delivery pipe for supplying oil to said combustion chamber, a valve supported by said pipe, a regulator sleeve rotatably fitted to said pipe and having an orifice adapted to be moved relative to said valve, a cap surmounting said housing in engagement with said regulator sleeve, and means beneath said cap for controlling the admission of air to said combustion chamber.

3. In an oil burner, a housing having a combustion chamber therein, an oil delivery pipe for supplying oil to said combustion chamber, a valve supported by said pipe, a regulator sleeve rotatably fitted to said pipe and having an orifice adapted to be moved relative to said valve, a cap surmounting said housing in engagement with said regulator sleeve, and adjustable means whereby said cap may be secured to said regulator sleeve.

4. In an oil burner, a combustion chamber having top and side walls, the top wall being provided with an inlet opening, means for delivering oil to said chamber, a housing surrounding said chamber, the lower portion of said housing being open to provide an air inlet, and means for spacing said housing away from the top and side walls of the

combustion chamber so as to form a passageway leading from the bottom of the housing to the top wall of the combustion chamber.

5. In an oil burner, a combustion chamber, an air regulator plate adjustably mounted on said combustion chamber, means for delivering oil to said chamber, a housing surrounding said chamber, the lower portion of said housing being open to provide an air inlet, a movable cap forming the top wall of said housing, means for connecting said cap to the air regulator plate, and means for spacing said housing away from the top and side walls of the combustion chamber so as to form a passageway leading from the bottom of the housing to the top of the combustion chamber.

6. In an oil burner, a housing, a movable cap forming the top wall of said housing, a combustion chamber having top and side walls that are inclosed by said housing, an air regulator plate mounted on said combustion chamber, an oil delivery pipe for supplying oil to said chamber, an oil regulating member fitted to said oil delivery pipe, and means for connecting said air regulator plate and oil regulating member to said movable cap.

7. In an oil burner, a housing providing a combustion chamber, means through which oil and air are admitted to said combustion chamber, a pan having communication with said combustion chamber, and a deflector member on said pan adapted to divide the current of hot air passing into said pan from the combustion chamber, said deflector member having a wing which extends upwardly and away from the combustion chamber, and a depending baffle which extends across the upper portion of said pan.

In testimony whereof, I have hereunto affixed my signature, this 19th day of November, 1909.

A. J. HENNESSEY.

In the presence of—
M. C. HAMMON,
E. B. LINN.