Sept. 20, 1927. 1,643,115

E. A. FIELD ET AL

OIL BURNER

Filed Dec. 14. 1925 2 Sheets-Sheet 1

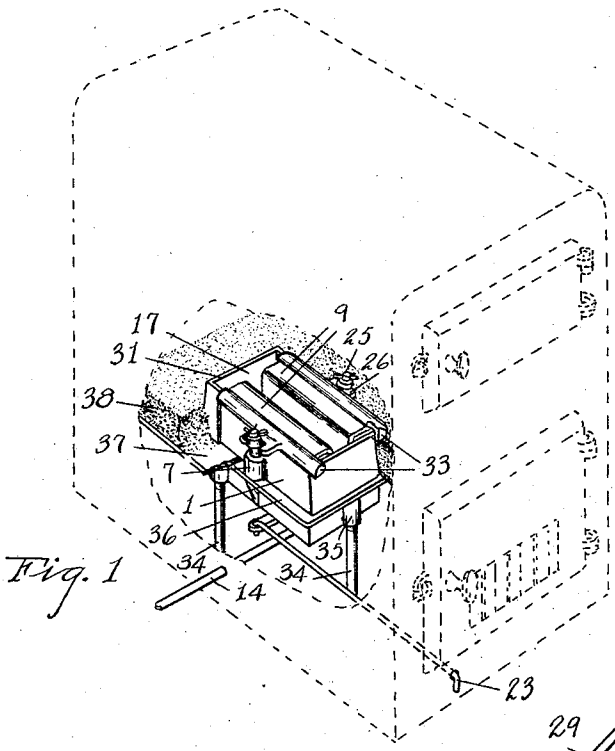


Fig. 1

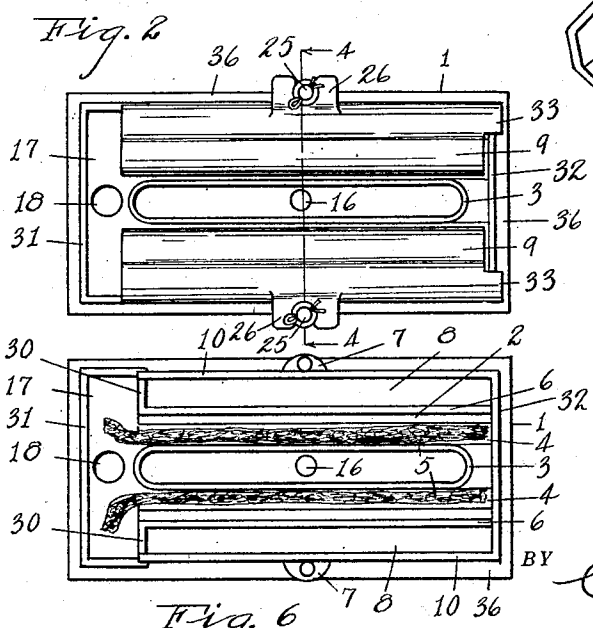


Fig. 2

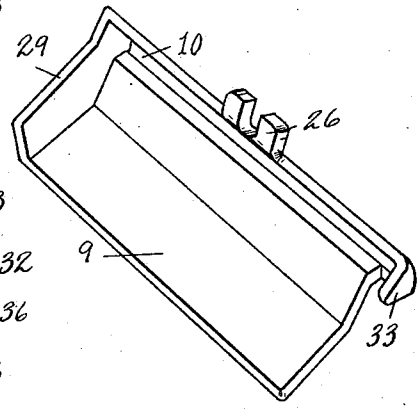


Fig. 7

INVENTOR
Edward A. Field
Edward A. Field Jr.

BY Chappell & Earl

ATTORNEYS

Fig. 6

Sept. 20, 1927. 1,643,115

E. A. FIELD ET AL

OIL BURNER

Filed Dec. 14. 1925 2 Sheets-Sheet 2

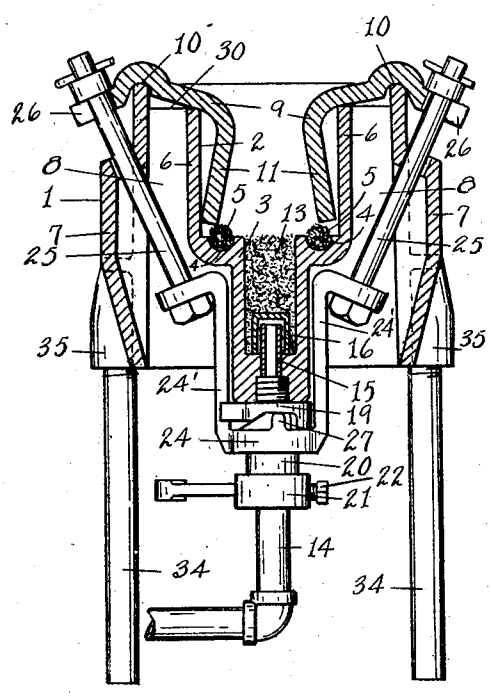


Fig. 4

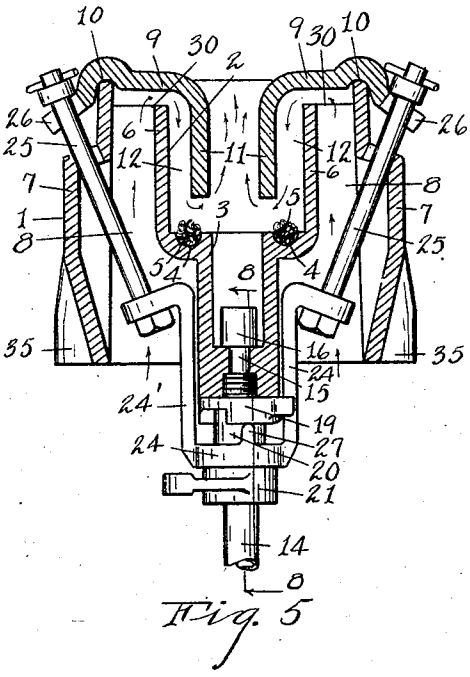


Fig. 5

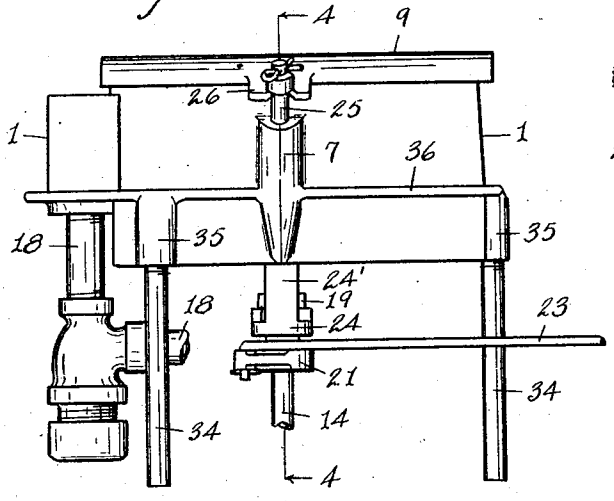


Fig. 3

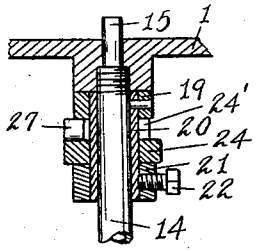


Fig. 8

INVENTOR
Edward A. Field
Edward A. Field Jr.

BY Chappell & Earl

ATTORNEYS

Patented Sept. 20, 1927. 1,643,115

UNITED STATES PATENT OFFICE.

EDWARD A. FIELD AND EDWARD A. FIELD, JR., OF CHICAGO, ILLINOIS.

OIL BURNER.

Application filed December 14, 1925. Serial No. 75,327.

The main objects of this invention are:

First, to provide an improved oil burner adapted for burning distillates, kerosene and other fuel oils which is highly efficient.

Second, to provide an improved burner of the class described which is well adapted for use in furnace boilers, cooking stoves and the like, it being capable of being easily embodied in various ways according to the particular installation or use required.

Third, to provide an improved oil burner embodying these advantages which is very simple and economical in structure and at the same time very durable.

Fourth, to provide an improved oil burner having no driven parts and one that does not require a fan for supplying air.

Objects pertaining to details and economies of construction and operation of the invention will definitely appear from the detailed description to follow. The invention is clearly defined and pointed out in the claims.

A structure embodying the features of the invention is clearly illustrated in the accompanying drawing forming a part of this application, in which:

Fig. 1 is a perspective view of one of the improved burners, the manner of installing the same in a boiler being illustrated and the boiler being conventionally shown by dotted lines.

Fig. 2 is a plan view of our improved burner.

Fig. 3 is a side elevation thereof, the fuel supply, overflow pipes and adjusting rod being broken away.

Fig. 4 is a detail view partially in vertical section on a line corresponding to line 4—4 of Figs. 2 and 3, the burner being shown with the parts adjusted to starting position.

Fig. 5 is a detail section corresponding to that of Fig. 4 with the burner adjusted to normal or running position.

Fig. 6 is a plan view with the adjustable air passage members removed.

Fig. 7 is an inside perspective view of one of the air passage members.

Fig. 8 is a detail vertical section on a line corresponding to line 8—8 of Fig. 5 showing details of the air passage member adjusting means.

Referring to the drawing, our improved burner comprises a case or body 1 of general rectangular form which is open at the top and bottom. Disposed centrally within the casing and preferably formed therewith as part of an integral casing is a generating chamber member 2 having a fuel trough 3 at the bottom thereof. This trough is disposed centrally of the generating chamber. At each side of the trough 3 are channels 4 for the wick 5, this wick being of asbestos or other heat resisting material.

The side walls 6 of the generating chamber are disposed in spaced relation to the side walls 7 of the casing providing air passages 8 at the sides of the generating chamber. These passages are closed at the top by the air passage members 9 which have longitudinal grooves 10 in their under sides engaging the upper edges of the wall 7 so that these passage members are tiltingly supported upon the walls. These passage members have depending skirt portions 11 which depend within the generating chamber forming return or down draft air passages 12 when the passage members are in the open or normal position as shown in Fig. 5.

When the air passage members are closed or adjusted to the position shown in Fig. 4 they rest upon the upper edges of the walls 6 thereby closing the passages 8 and also exposing the wicks 5 within the generating chamber. These passage members form the mouth of the generating chamber, the flow of air and the mixed air or vapor and gases being indicated by dotted lines in Fig. 5. The combustion takes place as the combustible gases issue from this mouth.

In use these passage members become heated and, being quite heavy castings, serve to pre-heat the air as it is carried downward in the passages 12 and also aid in vaporizing and mixing of the air and fuel.

The trough 3 is preferably filled with an oil distributing material indicated at 13, coarse sand having proved satisfactory for this purpose. However, asbestos wool and other fire resisting materials may be satisfactorily used in this relation.

The fuel pipe 14 has a nozzle or tip 15 delivering centrally into the trough 3. A cap 16 placed loosely over the end of the nozzle prevents the material 13 falling into the nozzle.

At one end of the casing is an overflow trough 17 for the fuel trough, the return pipe 18 leading from this overflow. In practice the overflow is operatively associated with the feed valve so that in the event of the burner becoming extinguished the flow

of fuel is stopped. Devices for this purpose are known in the art and as this forms no part of the present invention it is not illustrated herein.

In the embodiment illustrated the air passage members 9 are simultaneously adjusted by means of the cam 19 carried by the sleeve 20 mounted on the fuel supply pipe 14. This sleeve is provided with a lever 21 which is adjustably secured by means of the set screw 22 so that the adjusting rod 23 may be arranged as the particular installation renders most desirable.

Mounted upon this sleeve 20 is a yoke 24, the arms 24' of which are connected by the links 25 to the slotted ears 26 on the members 9. This yoke has lugs 27 engaging the cam. Rotation of the sleeve from the operative or normal position shown in Fig. 5 to the position shown in Fig. 4 allows these lugs to drop into the recesses of the cam, thus allowing the passage members to swing or tilt to the position shown in Fig. 4.

In starting the burner the parts are adjusted to the position shown in Fig. 4 and the fuel turned on until the trough overflows, saturating the wicks which are then lighted and permitted to burn until the parts become sufficiently heated to generate the vapor. The members 9 are then adjusted to the position shown in Fig. 5, the air flows upwardly through the passages 8 and downwardly through the passages 12 into close proximity with the fuel feed means described, and the vapors of the fuel are entirely mixed with this air which becomes heated.

In the embodiment illustrated the members 9 have end walls 29 which overlap the end walls 30 of the passages 8, these end walls 30 being spaced from the end walls 31 of the casing to provide the trough 17. The end wall 32 of the casing also constitutes an end wall for these passages 8.

The lugs 33 on the passage members 9 engage over the end walls 32 of the casing supporting the parts and permitting their tilting adjustment without the necessity for pivots. The links 25 are arranged through openings 26 provided in the side walls of the casing, thereby securing a substantially direct pull on the adjusting yoke.

In installing the burner in a firepot, it is preferably supported by legs 34 which are adjustably threaded into bosses 35 on the casing, thus permitting the leveling of the burner. The casing is provided with flanges 36 adapted to support the plate 37 which is of such size as to fit within the fire pot, the fire pot being filled in around this plate with sand indicated at 38, thereby providing an approximately air-tight closure around the burner, the air flowing through the burner and compelling all the air for combustion to pass through the burner.

The heating of the air by the burner induces the proper flow of air so that it is unnecessary to provide fans or blowers for forcing the air thereto. We thus avoid the annoyance incident to a motor and the expense of maintaining the same and the movable parts.

Our improved burner is very economical to produce and at the same time is highly efficient. We have illustrated and described our improvements in an embodiment which we have found very practical. We have not attempted to show various modifications and adaptations as we believe the disclosure made will enable those skilled in the art to embody or adapt the same as may be desired.

Having thus described our invention what we claim as new and desire to secure by Letters Patent is:

1. The combination in a burner, of an elongated casing open at the top and bottom, a generating chamber open at the top and having a centrally disposed fuel trough at the bottom thereof and wick channels at the sides of the fuel trough, said generating chamber being disposed centrally and longitudinally of the casing and in spaced relation to its side walls providing an air inlet passage at the sides of the generating chamber, said fuel trough containing fuel distributing material and said wick channels being provided with wicks, there being an overflow trough at one end of said fuel trough and wick channels, air passage members tiltably mounted on the upper edges of the casing side walls to overhang said air passage and depending within said generating chamber providing return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages and exposing the wicks within the mixing chamber, a vertically disposed fuel feed pipe for said fuel trough, a sleeve rotatably mounted on said pipe and provided with a downwardly facing cam, a yoke slidable on said sleeve below said cam to be actuated thereby, and links connecting the arms of said yoke to said passage members.

2. The combination in a burner, of an elongated casing open at the top and bottom, a generating chamber open at the top and having a centrally disposed fuel trough at the bottom thereof and wick channels at the sides of the fuel trough, said generating chamber being disposed centrally and longitudinally of the casing and in spaced relation to its side walls providing an air inlet passage at the sides of the generating chamber, there being an overflow trough at one end of said fuel trough and wick channels, air passage members tiltably mounted on the upper edges of the casing side walls to overhang said air passage and depending within said generating chamber providing return

air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages, a vertically disposed fuel feed pipe for said fuel trough, a sleeve rotatably mounted on said pipe and provided with a downwardly facing cam, a yoke slidable on said sleeve below said cam to be actuated thereby, and links connecting the arms of said yoke to said passage members.

3. The combination in a burner, of an elongated casing open at the top and bottom, a generating chamber open at the top and having a centrally disposed fuel trough at the bottom thereof and wick channels at the sides of the fuel trough, said generating chamber being disposed centrally and longitudinally of the casing and in spaced relation to its side walls providing an air inlet passage at the sides of the generating chamber, said fuel trough containing fuel distributing material and said wick channels being provided with wicks, there being an overflow trough at one end of said fuel trough and wick channels, and air passage members tiltably mounted on the upper edges of the casing side walls to overhang said air passage and depending within said generating chamber providing return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages and exposing the wicks within the mixing chamber.

4. The combination in a burner, of an elongated casing open at the top and bottom, a generating chamber open at the top and having a centrally disposed fuel trough at the bottom thereof and wick channels at the sides of the fuel trough, said generating chamber being disposed centrally and longitudinally of the casing and in spaced relation to its side walls providing an air inlet passage at the sides of the generating chamber, and air passage members tiltably mounted on the upper edges of the casing side walls to over-hang said air passage and depending within said generating chamber providing return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages.

5. The combination in a burner, of a casing open at the top and bottom, a generating chamber within said casing open at the top and having a fuel trough at the bottom thereof and wick channels at the sides of the trough, there being air inlet passages at the sides of the generating chamber, said fuel trough containing a fuel distributing material and said wick channels being provided with wicks, air passage members adjustably mounted on said casing walls to overhang said air passage and depending within said generating chamber providing when open return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages and exposing the wicks within the mixing chamber, a vertically disposed fuel pipe for said fuel trough, a cam rotatably mounted on said pipe, and a yoke operatively associated with said cam and connected to said passage members.

6. The combination in a burner of a casing open at the top and bottom, a generating chamber within said casing open at the top and having a fuel trough at the bottom thereof, there being air inlet passages at the sides of the generating chamber, air passage members adjustably mounted on said casing walls to overhang said air passage and depending within said generating chamber providing when open return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages, a vertically disposed fuel pipe for said fuel trough, a cam rotatably mounted on said pipe, and a yoke operatively associated with said cam and connected to said passage members.

7. The combination in a burner of a casing open at the top and bottom, a generating chamber within said casing open at the top and having a fuel trough at the bottom thereof and wick channels at the sides of the trough, there being air inlet passages at the sides of the generating chamber, said fuel trough containing a fuel distributing material and said wick channels being provided with wicks, and air passage members adjustably mounted on said casing walls to overhang said air passage and depending within said generating chamber providing when open return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages and exposing the wicks within the mixing chamber.

8. The combination in a burner of a casing open at the top and bottom, a generating chamber within said casing open at the top and having a fuel trough at the bottom thereof, there being vertical air inlet passages at the sides of the generating chamber, and air passage members adjustably mounted on said casing walls to constitute top walls of said air passages and depending within said generating chamber providing when open return air passages delivering in proximity to said fuel trough, said passage members being adapted to rest on the generating chamber walls when in one position thereby closing the air passages.

9. The combination in a burner, of a casing open at the top and bottom, a generating chamber having a fuel trough at the bottom thereof, and wick channels at the sides of the trough, said generating chamber being disposed within said casing providing air inlet passages at the sides of the chamber, said fuel trough containing a fuel distributing material and said wick channels being provided with wicks, and air passage members covering the upper ends of said air passages and depending within said mixing chamber providing return air passages delivering into proximity to said fuel trough, said air passage members being adjustably mounted to close said air passages and to expose the wicks within said generating chamber.

10. The combination in a burner, of a casing open at the top and bottom, a generating chamber having a fuel trough at the bottom thereof, said generating chamber being disposed centrally within said casing providing vertical air inlet passages at the sides of the chamber, and angled air passage members pivotally mounted on said casing to cover the upper ends of said air passages and depend within said generating chamber providing return air passages delivering into proximity to said fuel trough.

11. The combination in a burner, of a casing open at the top and bottom, a generating chamber having a feed means at the bottom thereof, said generating chamber being disposed centrally within said casing to provide vertical air inlet passages at the sides of the chamber, and angled air passage members pivotally mounted on said casing to cover the upper ends of said air passages and depend within said generating chamber providing a mouth for the burner and return air passages delivering into proximity to said fuel feed means, said air passage members being adjustably mounted to close said air passages.

12. The combination in a burner, of a casing open at the top and bottom, a generating chamber having a feed means at the bottom thereof, said generating chamber being disposed centrally within said casing to provide vertical air inlet passages at the sides of the chamber, and angled air passage members pivotally mounted on said casing to cover the upper ends of said air passages and depend within said generating chamber providing a mouth for the burner and return air passages delivering into proximity to said fuel feed means.

13. The combination in a burner, of a mixing chamber having a centrally disposed fuel trough at the bottom thereof and wick channels at the sides of the trough, said fuel trough containing a fuel distributing material and said wick channels being provided with wicks, there being an overflow for said fuel trough and wick channels, air passage members mounted to depend within said generating chamber in spaced relation to each other providing a mouth for the burner and with their lower edges adjacent the top of the trough and coacting with the casing walls providing air passages delivering downwardly adjacent the fuel trough, said members being tiltingly adjustable to close said passages and to expose the wicks within the generating chamber, and a fuel feed pipe delivering centrally to said trough.

14. The combination in a burner, of a mixing chamber having a fuel feed means at the bottom thereof, wicks disposed at the sides of the trough, and air passage members mounted to depend within said generating chamber in spaced relation to each other providing a mouth for the burner with their lower edges adjacent the top of the trough and coacting with the casing walls providing air passages delivering downwardly adjacent the fuel trough, said members being tiltingly adjustable to close said passages and to expose the wicks within the generating chamber.

In witness whereof we have hereunto set our hands.

EDWARD A. FIELD.
EDWARD A. FIELD, JR.