No. 729,205. PATENTED MAY 26, 1903.

J. H. MORRISSEY.

HYDROCARBON BURNER.

APPLICATION FILED JULY 21, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

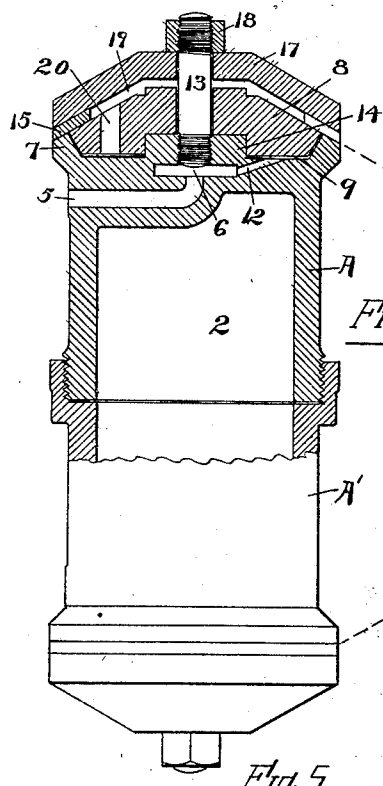


Fig. 1.

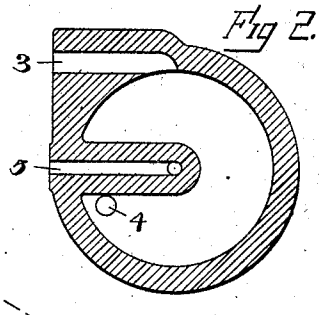


Fig. 2.

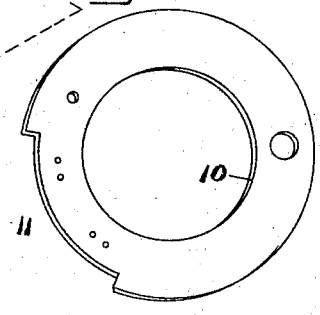


Fig. 3.

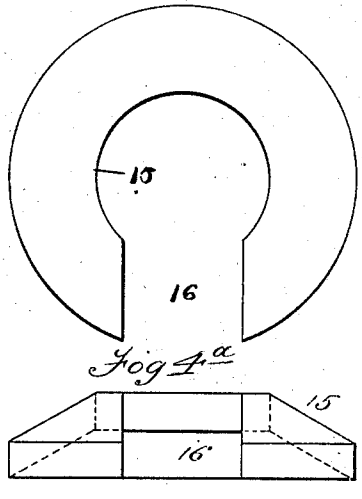


Fig. 4.

Fig 4a

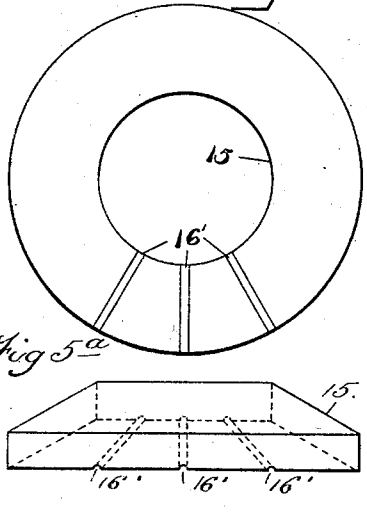


Fig. 5.

Fig 5a

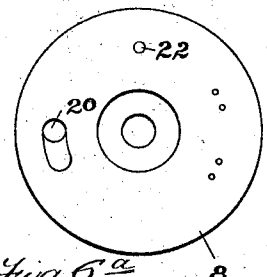


Fig. 6.

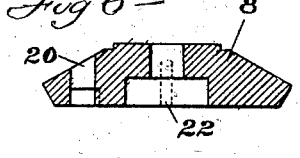


Fig 6a

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Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 7.

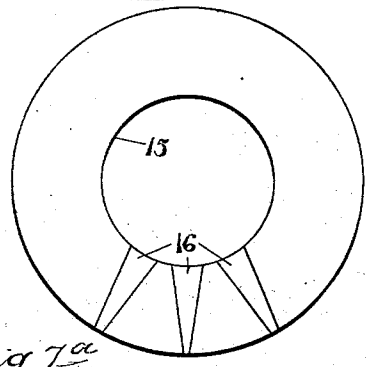


Fig. 7a.

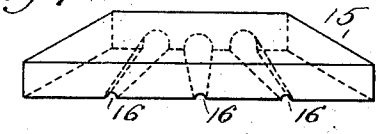


Fig. 8.

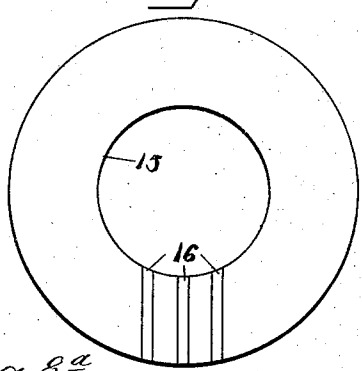


Fig. 8a.

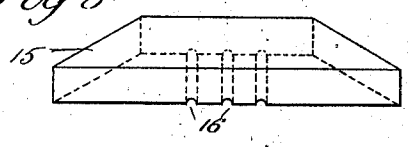


Fig. 9.

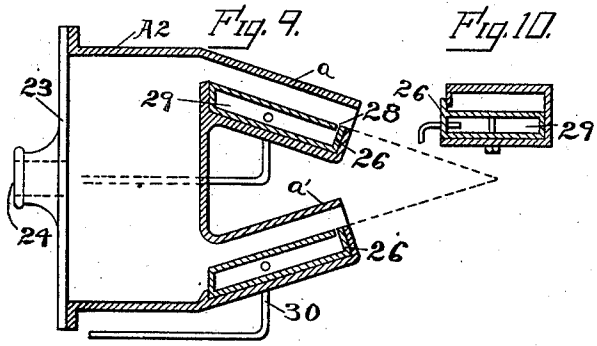


Fig. 10.

Fig. 11.

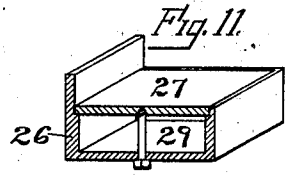


Fig. 12.

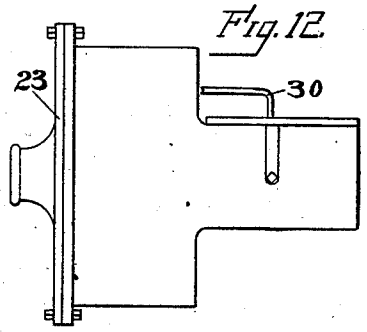
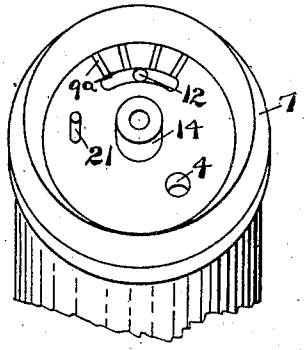


Fig. 13.



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No. 729,205. Patented May 26, 1903.

UNITED STATES PATENT OFFICE.

JAMES H. MORRISSEY, OF SAN FRANCISCO, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 729,205, dated May 26, 1903.

Application filed July 21, 1902. Serial No. 116,437. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. MORRISSEY, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Hydrocarbon-Burners; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in oil-burners for furnaces and the like. Its object is to provide a double-jet device of simple construction, one by which the flame can be directed according to the area or nature of the surface to be heated and employing a minimum air-pressure to effect volatilization of the oil.

It consists of the parts and the construction and combination of parts to be hereinafter set forth, having reference to the accompanying drawings, in which—

Figure 1 is a view, partially in section, of burner. Fig. 2 is a cross-section of burner. Fig. 3 is a view of spacer 10. Figs. 4, 5, 7, and 8 are plan views of ring 15. Figs. 4ª, 5ª, 7ª, and 8ª are edge views of the ring of Figs. 4, 5, 6, and 8. Fig. 6 is a view of cone 8. Fig. 6ª is a sectional view of said cone. Fig. 9 is a sectional view of modified burner. Fig. 10 is a section of A. Fig. 11 is a sectional view of 26. Fig. 12 is a bottom view of Fig. 9. Fig. 13 is a view of Fig. 1 with cap and cone removed.

In Fig. 1, A A′ represent the separable and complementary sections of the casing, inclosing the chamber 2. Steam or air under high pressure is admitted at 3 in section A and discharges through ports 4 in the end walls of either section. Each section is provided with an oil-feed inlet 5, discharging into an annular channel 6, disposed centrally in the end wall of the section. The outer end of each section is provided with an annular ledge 7, Figs. 1 and 13, inclosing a space in which is retained a centrally-perforated conical block 8 concentric with the ledge. An oil-space 9 is formed beneath the cone and between the adjacent surfaces of the cone and ledge. The space 9 may be made by cutting a channel in the bottom of the cone or in the end of the section to meet certain conditions, as 9ª, Fig. 13. In order to avoid expense in manufacture, a thin disk 10, having a cut-out portion 11, is interposed between the cone and end of the section. A passage 12 connects the space 9, embraced within the cut-out portion 11 of the disk, with the channel 6. A stud 13 screws into a boss 14 on the end of the section, and the cone and securing means therefor are adapted to slip over the stud. The circular space between the cone and ledge is covered by an annulus or ring 15 except for an opening 16 in the ring, which forms the discharge-orifice of either end of the burner. The parts are held in position by means of a cap 17 and a nut 18, screwing onto the stud. Steam is admitted to the space 19 between the cap, cone, and ring through port 20 in the cone, which port is adapted to register with port 4, communicating with steam-chamber 2.

In the present instance I have shown the device with the parts 7, 8, 15, and 17 on section A correspondingly tapered. Similar parts on A′ would be likewise tapered, so that the inflammable vapors issuing from orifices 16 (which latter are disposed on the same side of the burner) meet and commingle at a point exterior to the burner to create a broad fan-like flame, which can be varied in area and volume according to the width and size of the cut-away portions of the rings 15.

It is obvious that the foregoing parts, which are shown and described as tapered or cone-shaped, may be made flat, as where a single jet only is desired, and without in any way altering the character or departing from the principle of my invention.

The character of the vapor-discharge openings may be varied by providing rings having a series of grooves or channels 16′ disposed radially or otherwise, as in Figs. 5, 7, and 8.

Where a ring has a portion cut out, as in Fig. 4, it is preferred that the sides of the opening 16 should be parallel, since the steam cutting over the edges acts to equal advantage on all the oil coming up into the opening 16 from the space between the cone and

ledge. Where the walls of opening 16 are flared, it has been found necessary to form supplemental steam-ports 4′ 4^a 4^b, respectively, in the head of the section, disk, and cone to distribute the steam properly to the oil in the discharge-orifice. The thickness of the ring 15 depends on the steam-pressure.

In operation steam enters the chamber 2 intermediate of the ends of the burner. Oil is fed in through ports 5, passing thence through channels 6 and 12 into the space 9, embraced in the cut-out portion of the spacing-disk 10. Thence it flows up between the walls of the ledge 7 and cone 8 into the opening 16 in ring 15, where it meets the steam-current and is cut sharply or torn, as it were, over the edge of the ledge and passes into the furnace in the form of fine highly-inflammable vapor. The cone and ring are adjusted in relation to each other so that the steam coming in through port 20 discharges directly behind the center of the outlet 16, thereby being distributed equally around both sides of the stud 13. In order to insure the proper seating of the cone, so that ports 20 and 4 will always register, a pin 21, Fig. 13, is secured in the end of the casing and fits a recess 22 in the bottom of the cone, Fig. 6.

The foregoing-described burner is adapted for use where a considerable steam or air pressure is obtainable.

In Fig. 9 I have shown a modification where the same principle of a vapor-chamber is interposed between the ends of two convergent jets, but which is adapted more particularly for use where there is only a small air-pressure to be had and it is necessary to have larger vapor-discharge passages. This consists of a casing A^2, having the convergent branches a a' disposed at either end. A removable plate or bonnet 23 is adapted to fit over the end of the casing and has an air-inlet 24, or the bonnet may be removed and the casing set into the door of the furnace and the open-ended casing connected up with the blower, as when only a very low air-pressure is obtainable. The walls of the branches a a' have openings through which are inserted the oil-feed boxes 26. These boxes are each made with a removable cover 27, provided with an oil-discharge slit 28 at one end. Oil enters the chamber 29 in the boxes through pipes 30. The air-current passing through branches a a' and over the boxes 26 cuts the oil across the edges of the openings 28 as it issues therefrom, and the two convergent vapor streams issuing from the outlets 16^a meet at a common point exterior to the burner.

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

1. The combination in a hydrocarbon-burner, of a casing inclosing a steam-chamber said chamber having outlets at opposite portions, and having separate oil-inlets adapted to commingle their contents with the steam exterior to said chamber and means for discharging vapor toward a common point exterior to the burner.

2. The combination in a hydrocarbon-burner, of a casing inclosing a steam-chamber, convergent discharge-passages connected with said chamber, and separate oil-feed means one discharging into each of said passages.

3. The combination in a hydrocarbon-burner of a casing inclosing a steam-chamber, said casing having an outlet at each end, and having separate oil-feed inlets adapted to commingle their contents with the steam exterior to said chamber, and means constituting convergently-disposed vapor-outlets by which the commingled oil and steam is directed toward a common point exterior to the burner.

4. A hydrocarbon-burner, including in combination a casing, having a steam-inlet and steam-outlet at each end, a cone at each end of the casing, caps fitting said cones, and forming therewith steam and oil feed passages in which the oil and steam are commingled within the casing and through which passages the commingled vapor is directed to a common point exterior to the burner.

5. A hydrocarbon-burner, including in combination a casing, a steam inlet and outlet, an annular ledge upon the end of said casing, an annular block inclosed by said ledge, said casing having an oil-space between itself and said block, a cap fitting over said block, and forming a steam-space between itself and said block, and means forming a vapor-outlet passage communicating with the said oil and steam spaces.

6. The combination in a hydrocarbon-burner, of a casing inclosing a steam-chamber said casing having a head at each end provided with a steam-outlet; separate means for admitting oil to said heads; and means upon the heads including an annulus having vapor-discharge openings for conducting, mixing and discharging the oil and steam.

7. The combination in a hydrocarbon-burner, of a casing inclosing a steam-chamber, said casing having a steam-outlet in the head and an oil-passage leading into said head, an annular ledge upon the head, a cone inclosed by said ledge, means forming oil-passages between said cone and head and between the adjacent faces of the cone and ledge, an annulus upon the cone and overlapping the annular space between the cone and ledge, said annulus having outlet-passages, a cap fitting over said annulus, means for securing the parts together, said cone having steam-passages communicating with the steam-chamber and with the outlet-passages in the annulus.

8. The combination of a casing inclosing a steam-chamber and having a head provided

with means for admitting steam and oil; a removable block seated on said head and having a steam-passage, said head having an annular ledge, a spacing-plate fitting upon said ledge, and a cap fitting said plate, said cap, block and head forming oil and steam passages between them, substantially as described.

In witness whereof I have hereunto set my hand.

JAMES H. MORRISSEY.

Witnesses:
S. H. NOURSE,
JESSIE C. BRODIE.