No. 713,902. Patented Nov. 18, 1902.

J. H. MORRISSEY.

HYDROCARBON BURNER.

(Application filed Dec. 20, 1901. Renewed Oct. 25, 1902.)

(No Model.)

Fig. 1.

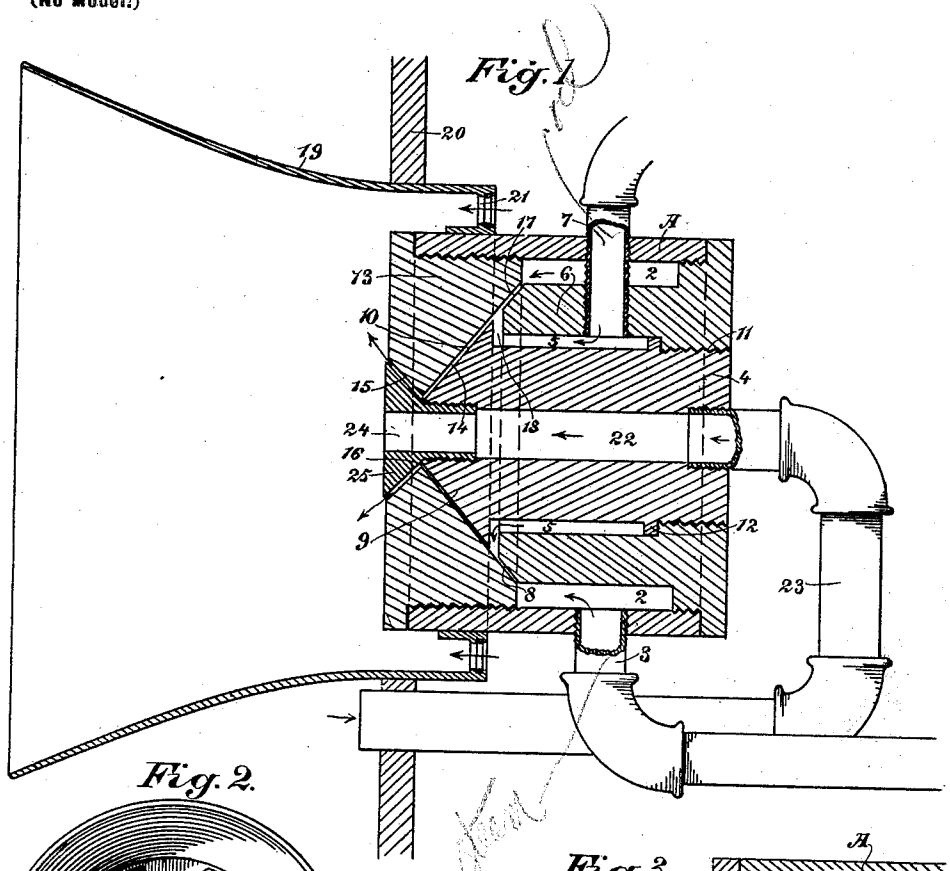


Fig. 2.

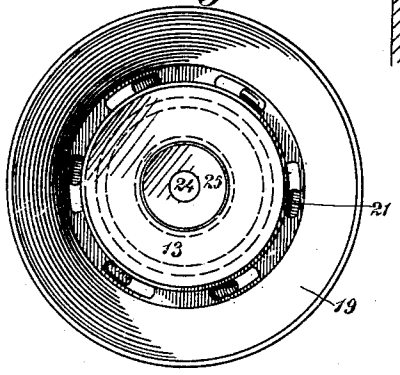


Fig. 4.

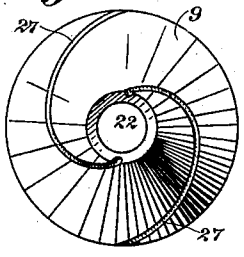


Fig. 3.

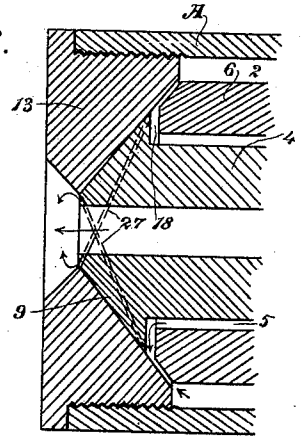
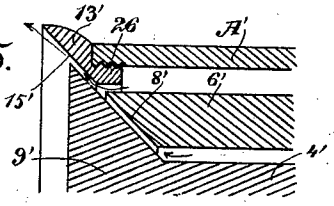


Fig. 5.



Witnesses,
H. Dorse
H. F. Aschenbach

Inventor,
James H. Morrissey
by Dewey Thought & Co.
Attys

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

UNITED STATES PATENT OFFICE.

JAMES H. MORRISSEY, OF SAN FRANCISCO, CALIFORNIA.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 713,902, dated November 18, 1902.

Application filed December 20, 1901. Renewed October 25, 1902. Serial No. 128,827. (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 burners such as are adapted for use in furnaces and the like.

It consists of a shell or casing inclosing separate and concentric oil and steam passages, pipes entering said passages, a plug movable centrally of said casing, a flanged head on said plug, a cap fitting the discharge end of the casing, said cap and plug movable in relation to each other and to the discharge-orifices of the oil and steam passages, whereby the vapor-supply to the furnace is regulated, and a central air-passage through said plug, whereby air may be fed to the commingled oil and steam.

It also comprises novel means for combining the burner with a furnace and regulating the feed of hot and cold air drafts and comprises details which will be more fully set forth hereinafter, having reference to the accompanying drawings, in which—

Figure 1 is a longitudinal section through the burner. Fig. 2 is an end view of the same. Fig. 3 is a sectional view of the forward end of the burner, showing a modification. Fig. 4 is a front view of the head of the plug. Fig. 5 is a sectional view of the part of the burner, showing still another modification.

A represents a cylindrical shell or casing of any suitable diameter and length. An annular passage or channel 2, opened at one end, is formed in the casing. Steam is admitted to this passage through the pipe 3. The shell is longitudinally and centrally bored, and a plug 4 operates in this bore. An annular passage-way or channel 5 is formed between the plug and the annular partition or wall 6 of the shell. This passage is also open at one end, and the oil-pipe 7 discharges therein. The end of the wall 6 is beveled between the passages 2 and 5, as shown at 8. The plug is provided with a flange or head 9, which has its edge 10 beveled correspondingly with the inclined surface 8. The plug and shell are screw-threaded, as at 11, to permit of the ready adjustment of the plug in relation to the steam and oil feed, and a flange 12 limits the rearward movement of the plug. A cap 13, having a central perforation 16, is screw-threaded in the discharge end of the burner and has an inner annular surface 14, inclined correspondingly with the bevels 8 and 10. The outer side 15 of the cap diverges from the discharge-orifice 16, as shown, so as not to interfere with the proper distribution of the vapors within the furnace. The steam from the passage 2 passes down through the annular channel 17, formed between the partition 6 and the cap 13, where it meets the oil issuing in a thin layer through the annular passage 18 between the end of the partition 6 and the inner wall of the head 9 of the plug. The vapor formed by the mixing of the oil and steam is then blown outward between the cap and plug.

The burner is secured in a bell or funnel shaped mouthpiece 19, fixed in the boiler-front 20, and has its flared end extending within the furnace. By means of an air-register 21, interposed between the mouthpiece and the burner, a suitable amount of cold air is admitted to commingle with the steam and oil in order to effect perfect combustion. The plug may be formed with a central longitudinal passage 22, connecting with a pipe 23, by which a circulation of heated air through the furnace and burner may be secured. The disposition of the oil-passage 5 intermediate of the steam and hot-air passages 2 and 22 causes the oil to be thoroughly heated, and volatilization takes place rapidly and easily. It is essential, however, that only heated air be admitted through the passage 22. The draft induced through the latter assists also to distribute the vapor issuing from the burner. Ordinarily the vapors issuing from orifice 16 will center a short distance from the orifice and then diverge again against the walls of the bell 19. In order that this distribution may be more positively effected, I may interpose a plug 25, centrally perforated at 24 in the end of the plug-passage 22. This plug is provided with a cone-shaped head, between

which and the wall 15 of the cap the vapor passes divergently outward against the bell and into the furnace, or, as in Fig. 5, the wall 6′ may be extended farther toward the front of the burner and its end 8′ given an outward and upward bevel. The cap 13′ is then formed with a narrowed threaded flange 26, by which it is secured in the end of the casing. The cap is made flaring and its edge 15′ is beveled correspondingly with the beveled surface 8′. The plug 4′ has an enlarged head 9′ in the form of a divergent cone, so that the commingled oil and steam issuing from between the head and cap are spread out over the whole interior of the furnace, or the head 9 of the plug 4 may have its beveled surface contact with the cap 13 and be provided with a series of curved radiating grooves 27, as shown in Figs. 3 and 4, by which the inflammable vapor is given a swirling movement as it issues from the burner.

While I have described my burner, for convenience, as having the wall portion 6 and outer casing integral and bored out to receive the plug 4, it may be made, for the purpose of simplifying construction, with the three parts separate, as shown, the plug 4 screwing into the portion 6 and the latter screwing into the outer cylinder or casing A. Thus constructed the parts are easily and quickly assembled and readily taken apart for purposes of inspection, cleaning, &c.

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

1. A hydrocarbon-burner comprising a body portion having separated and concentric steam and oil passages formed therein said body having its discharge end substantially cone-shaped to provide inclined walls; a partition or wall interposed between the passages and having its end separated from the adjacent wall of the body, and having said end provided with inclined walls arranged in line with the corresponding walls of the body; and a perforated cap at the discharge end of the burner and having an inner wall inclined to correspond with the like walls of the body and partition, and separated from the latter to form a vapor-passage, said annular steam-passage connecting with the end of said vapor-passage and said annular oil-passage connecting with an intermediate portion of said vapor-passage whereby the oil and steam are caused to be intimately mixed in said passage before being delivered at the discharge end.

2. The combination of a casing inclosing separate oil and steam passages, pipes entering said passages, a plug within the casing having a passage centrally through it and having a converging end and an annular flange forming a wall of a lateral oil-passage, a perforated cap fitting the discharge end of the casing and having its inner walls inclined to correspond with the converging end of the plug said walls of the plug and cap forming a passage with which the said lateral oil-passage connects at a point back of the point of the plug, and said cap and plug movable one relative to the other.

3. The combination of a casing having an annular partition, a plug concentric with said partition said casing, partition and plug separated from each other to form steam and oil passages, steam and oil pipes entering said passages, and a perforated cap fitting the discharge end of the casing, said plug and cap having their adjacent walls correspondingly tapered to form between them a passage for steam and oil, and said plug having a lateral passage connecting the oil-passage with the passage formed by the tapered walls of the plug and cap.

4. The combination in a hydrocarbon-burner of a shell or casing inclosing concentric oil and steam passages, an annular wall separating said passages, the end of said wall beveled, an annular plug concentric with said annular wall, and said oil-passage formed intermediate of said wall and plug, a flange on the end of said plug, said flange and the said beveled wall forming substantially a cone-shaped head and said flange adapted as the plug is moved longitudinally to vary the size of the discharge-orifice of the said oil-passage, said head having its end walls inclined correspondingly with the beveled end of the said wall, and a perforated cap adjustably fitting the end of the casing and having a surface beveled correspondingly with the aforesaid beveled surfaces, said cap and plug movable in relation to each other whereby the discharge of the commingled steam and vapor from the burner may be regulated.

5. The combination in a hydrocarbon-burner, of a casing, an annular partition therein the space between said partition and casing closed at one end and open at the other, a screw-plug centrally within said partition, an annular space between said plug and partition open at the end corresponding with the opening of the space between the casing and partition, a longitudinal passage through said plug, a perforated beveled head on the latter, a perforated beveled cap fitting the end of the casing, said plug and head movable one relative to the other so as to contract or enlarge the vapor-discharge orifices, and a perforated plug or spreader having a head beveled oppositely to the head on the first plug and adjustably secured in the end of the latter.

6. In a hydrocarbon-burner, the combination of a cylindrical exterior casing, a hollow annular partition screwed into said casing, an annular turned-down portion on said partition, a steam-inlet entering said annular turned-down portion, the end of said partition having an annular inclined surface, a plug fitting the hollow portion of said partition, said plug having an annular turned-down portion, an oil-inlet entering therein, a flange or head on

the end of said plug, said flange having its outer surface beveled correspondingly with the bevel of the partition, a centrally-perforated screw-cap fitting the open end of said casing and having its inner surface beveled correspondingly with the aforesaid beveled surfaces.

7. The combination in a hydrocarbon-burner of a body portion or casing having an axial bore, a plug in said bore, an oil-passage formed between said plug and the wall of said bore, an annular steam-passage intermediate of said oil-passage and the exterior of the burner-casing, a perforated cap adjustably fitting the end of the casing, said cap having an inner beveled surface, said plug having a head beveled correspondingly with the beveled surface of said cap and curved radial grooves upon the surface of said head through which the commingled steam and oil are discharged.

In witness whereof I have hereunto set my hand.

JAMES H. MORRISSEY.

Witnesses:
S. H. NOURSE,
GEO. H. STRONG.