

No. 746,525.

PATENTED DEC. 8, 1903.

C. H. KNOBBS.
HYDROCARBON BURNER.
APPLICATION FILED NOV. 21, 1902.

NO MODEL.

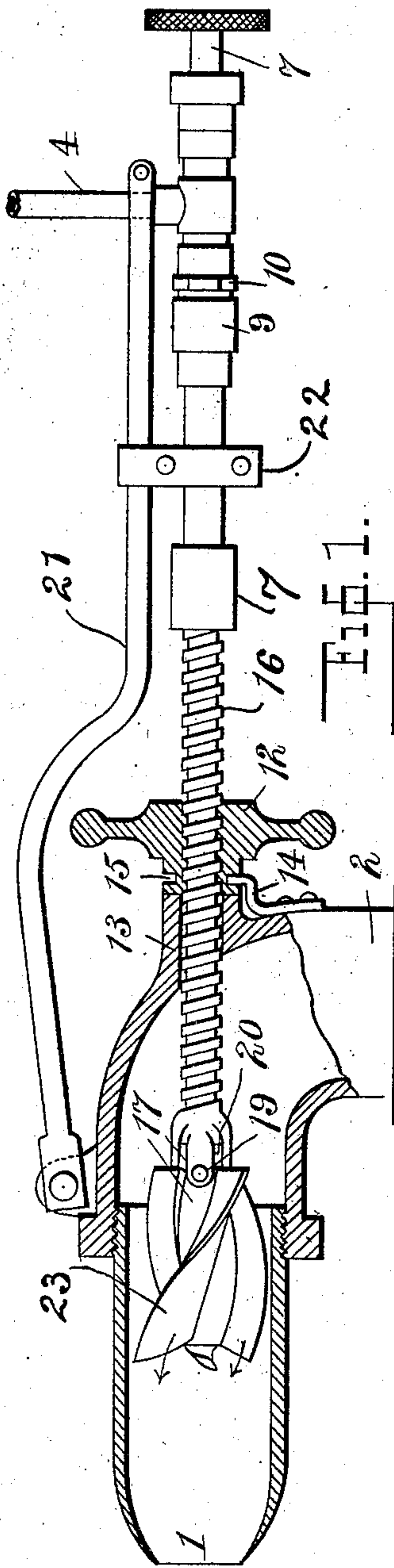


Fig. 1.

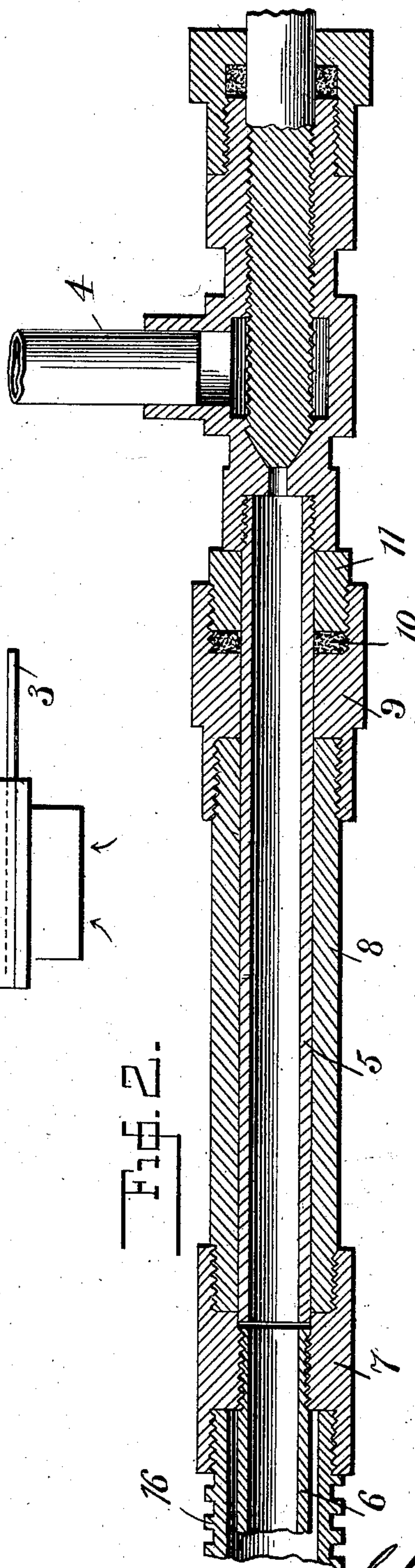


Fig. 2.

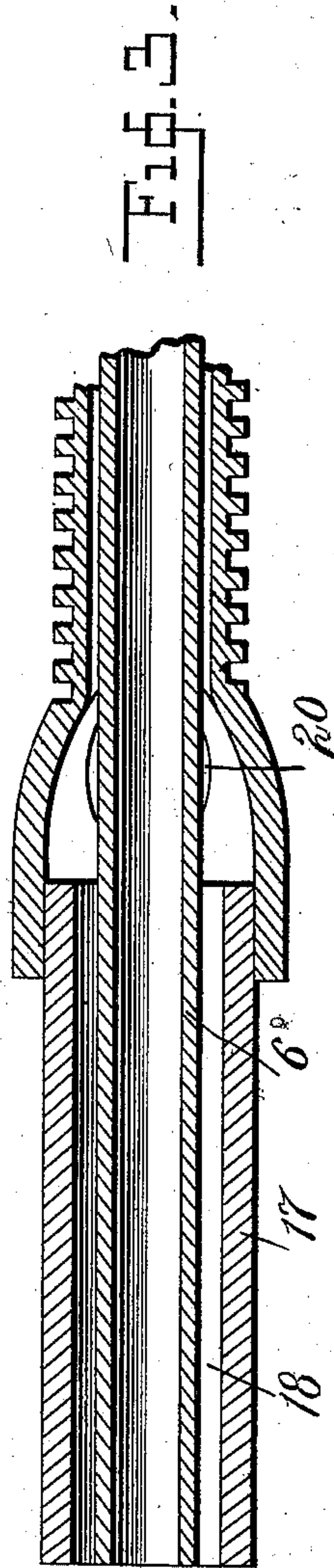


Fig. 3.

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UNITED STATES PATENT OFFICE.

CHARLES H. KNOBBS, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO PETER M. KLING, OF ELIZABETH, NEW JERSEY.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 746,525, dated December 8, 1903.

Application filed November 21, 1902. Serial No. 132,276. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. KNOBBS, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented a new and Improved Hydrocarbon-Burner, of which the following is a specification.

My invention relates to hydrocarbon or oil burners for use in furnaces, and has for its object to provide a burner possessing new and advantageous features of construction and which is provided with ready means of adjustment, so as to give in operation any effect desired.

In the accompanying drawings I have illustrated a form of burner embodying my invention.

Figure 1 shows the burner partly in section. Fig. 2 is a longitudinal sectional view, on a larger scale, of the feed end of the oil-pipe. Fig. 3 is a longitudinal sectional view of the delivery end of the oil-pipe.

Similar reference-numerals indicate corresponding parts in the different views of the drawings.

1 represents the nozzle or vaporizing-chamber, fitted to the delivery end of an air or steam supply pipe 2. A suitable damper 3 is provided in the air or steam pipe to control the air or steam supply. The oil is led to the nozzle or vaporizing-chamber from a suitable source of supply through pipes 4, 5, and 6. A valve 7, of suitable construction, is arranged in pipe 4 to regulate the supply of oil.

Pipes 5 and 6 are a continuation one of the other and form a continuous conduit for the oil. Pipe 6 has a sliding engagement with pipe 5, so that pipe 6 may be moved in or out with respect to the furnace.

In the form of my invention illustrated in the drawings the means employed to obtain the longitudinal sliding movement of pipe 6 consists of a telescopic joint, the arrangement being as follows: To pipe 6 is coupled, by means of coupling 7, a tubular section 8, which surrounds pipe 5. In order to have oil-tight connection with pipe 5, pipe 6 is provided at its end with a stuffing-box 9, having the usual packing 10 and gland 11.

The means for adjusting the sliding movement of pipe 6 consists of a hand-wheel 12,

having threaded engagement with said pipe. Hand-wheel 12 is mounted adjacent a boss on the air-delivery pipe 2 by means of a collar-piece 14, which engages an annular groove 15 on said hand-wheel and is secured in suitable position on the air-delivery pipe 2.

The engagement of hand-wheel 12 with pipe 6 may be directly with screw-threads or channels formed on said pipe, but is conveniently accomplished by providing a separate and exteriorly-screw-threaded section 16, surrounding pipe 6 and threaded in the same coupling 7 which unites pipe 6 to slidable sleeve or section 8. (See Fig. 2.)

It will readily be seen from the above description that by turning hand-wheel 12 in one direction or the other the delivery end of the oil-pipe may be extended into or withdrawn from the furnace to any desired amount.

I provide the delivery end of the oil-pipe with means to insure the thorough and complete vaporization or atomizing of the oil. These means consist of spiral blades 23, mounted upon a cylindrical piece or sleeve 17, which surrounds the delivery end of the oil-pipe 6 and forms an annular space 18 between itself and the oil-pipe. Said sleeve 17 is shown connected with the threaded pipe 16 at 19.

The end of pipe 16 is expanded and slotted to form openings. (Indicated by the arrow 20, Fig. 1.) These openings are for the purpose of conducting air to the space 18, surrounding the end of the oil-pipe.

A suitable guide and supporting rail 21 is provided, having one of its ends attached to the air-delivery chamber and its other end secured to the oil-pipe. A yoke-piece 22 is attached to the sleeve 8 and slides upon said supporting-rail 21.

The operation of the device will be readily understood from the above description. The air-damper 3 and oil-valve 7 are opened to supply the proper amount of air and oil to produce the perfect vaporizing of the oil and to give the character of flame or jet desired. By means of the adjustment obtained by the hand-wheel 12 the jet or combustion of the oil may be directed and modified to give any effect desired. In the position shown in

Fig. 1 the delivery end of the oil-pipe is withdrawn within the vaporizing-chamber. This position gives a greater diffusion of the jet or flame, and consequently the spreading of the heat over a large area in the furnace. By screwing the delivery-pipe or burner outwardly toward the end of the nozzle or vaporizing-chamber the burner is moved nearer the furnace, and the combustion or jet is more concentrated. It will thus be seen that any adjustment of the burner may be made to secure results varying from an intense flame or jet concentrated upon a particular point in the furnace to a widely-diffused combustion spreading over the whole furnace.

In addition to the adjustment of the jet to produce the variety of effects above described my invention permits the withdrawal of the burner end of the oil-pipe, together with the blades, from the furnace when the furnace is closed down. The burner is thus saved from exposure to heat when not in operation. This prolongs the life of the burner by preventing the burning away of its parts.

The construction of the burner with spiral wings or vanes and the provision of means to conduct a portion of the air to the annular space surrounding the end of pipe 6 accomplish important results. The air passing around the outside of the burner and acted upon by the vanes tends to form a suction at the end of the oil-pipe. By conducting air within the sleeve on which the vanes are mounted this suction at the end of the pipe is destroyed.

Another important function served by conducting air to the annular space surrounding the end of the oil-pipe is the prevention of the deposition of carbon within the pipe. In other forms of burners the oil-pipes have a tendency to clog or choke up due to the deposition of carbon from the oil therein, which results from the exposure of the pipes to the heat. My invention provides means whereby the end of the oil-pipe is kept cool and baking of the oil and deposition of carbon resulting in the choking of the pipes is prevented.

I have mentioned air as a vaporizing agent; but it will be understood that steam or any other suitable agent may be employed without departing from my invention.

By my invention it will be seen that I have provided a burner which permits of an easy adjustment throughout a wide range, enabling the heat to be regulated and directed according to the nature of the work in hand. It also provides an efficient means for securing a uniform vaporization of the oil, obviating the formation of any suction or vacuum zones in the blast, while at the same time preventing clogging of the pipes.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A hydrocarbon-burner having a fuel-pipe formed of a plurality of coaxial sections, a

connection between said sections permitting a relatively longitudinal movement of the sections such that the burner end of said pipe may be adjusted to regulate the flame and may also be withdrawn from the heat action of the furnace, means to supply a vaporizing agent to the burner end of said fuel-pipe, means to regulate the delivery of said agent, and means to adjust the burner end of said fuel-pipe independently of the discharge of the vaporizing agent.

2. A hydrocarbon-burner, the fuel-pipe of which is formed of a plurality of sections arranged in axial line one with another, one of said sections stationary and another of said sections longitudinally movable with respect thereto to permit of adjustment of the flame and withdrawal of said movable section from the heat area of the furnace, means to feed and discharge a vaporizing agent at the free end of the movable section, and means to move the movable section independently of the feed and discharge of the vaporizing agent.

3. A hydrocarbon-burner, the fuel-pipe of which comprises a stationary section and a longitudinally-movable section arranged in axial line one with the other, the movable section constituting the delivery or burner portion of the fuel-pipe, means to deliver a vaporizing agent at the burner or delivery end of the movable section, and means to adjust the movement of said section independently of the delivery of the vaporizing agent to regulate the flame and withdraw the burner end of the pipe from the heat area of the furnace.

4. A hydrocarbon-burner having its fuel-pipe composed of a plurality of sections arranged in axial line one with another, connections between said sections permitting movement of the discharge or burner end of the fuel-pipe such that the flame may be adjusted and the burner end of the pipe removed from the heat area of the furnace, means to deliver a vaporizing agent at the burner end of the pipe, and means cooperating with a section of the pipe to regulate the movement of the discharge or burner section independently of the delivery of the vaporizing agent.

5. A hydrocarbon-burner having a fuel-pipe formed of a plurality of sections, telescopic connection between said sections permitting movement of the discharge or burner end of the pipe to regulate the flame and to withdraw the same from the heat area of the furnace, means to deliver a vaporizing agent at the burner end of the pipe, and means to adjust the movement of the burner or delivery end of the pipe independently of the delivery of the vaporizing agent.

6. A hydrocarbon-burner comprising a fuel-pipe having a stationary section, and a movable section, telescopic engagement between said sections, the movable section provided with vaporizing means at its outer end, and means on said section to move the same lon-

gitudinally to regulate the flame and to withdraw said vaporizing means out of the heat area of the furnace.

7. A hydrocarbon-burner comprising a vaporizing-chamber, a fuel-pipe therein, said fuel-pipe comprising a movable section and a stationary section, a sleeve surrounding the stationary section and slidable thereon, said sleeve coupled to the movable section, vaporizing means at the free end of the movable section, and means to adjust the vaporizing means within the vaporizing-chamber to regulate the flame and also to withdraw said vaporizing means from the heat area of the furnace.

8. A hydrocarbon-burner the fuel-pipe of which is in two sections, said sections arranged in axial line with each other, a sleeve slidably mounted on one of said sections, a coupling connecting said sleeve with the other of said sections, a second sleeve surrounding the latter section and coupled thereto and also coupled to said first-named sleeve, means engaging the second-named sleeve to move the same and the pipe-section connected therewith longitudinally, and a vaporizing means connected with the movable section.

9. A hydrocarbon-burner comprising a fuel-pipe having a stationary section and a movable section, a sleeve connected to the movable section and surrounding the stationary section, packing means between said sleeve and the stationary section, an externally-screw-threaded sleeve connected with and surrounding the movable section, a threaded hand device engaging said threaded sleeve to move said sleeve and movable section longitudinally, and vaporizing means at the outer end of the movable section.

10. In a hydrocarbon-burner, a vaporizing-

chamber, a fuel-delivery pipe therein, a sleeve surrounding the end portion of said pipe and forming an annular space between said sleeve and pipe, deflecting-blades mounted on said sleeve, means to conduct a vaporizing agent to the exterior and interior of said sleeve, and means to move said pipe and sleeve longitudinally within said chamber.

11. A hydrocarbon-burner comprising a fuel-supply pipe having a stationary and a movable section, a sleeve connected with and surrounding the movable section and having means thereon to adjust the movement of said section; a second sleeve surrounding the delivery end of said movable section, connections between said sleeves, a vaporizing-chamber surrounding the delivery end of the movable section, means to supply a vaporizing agent to said vaporizing-chamber, and openings between the sleeves to admit the vaporizing agent to the space between the delivery end of the fuel-pipe and the second-named sleeve for the purpose described.

12. A hydrocarbon-burner having a fuel-supply pipe formed of a plurality of coaxial sections, means whereby a vaporizing agent may be supplied to the burner end of said fuel-supply pipe, means to regulate the delivery of said agent, and a connection between adjacent sections of the fuel-supply pipe permitting movement of the burner end of the pipe in axial direction to regulate the flame and also to withdraw the burner end of the pipe from the heat action of the furnace to an extent limited by the length of the sections of the fuel-supply pipe.

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Witnesses:

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