

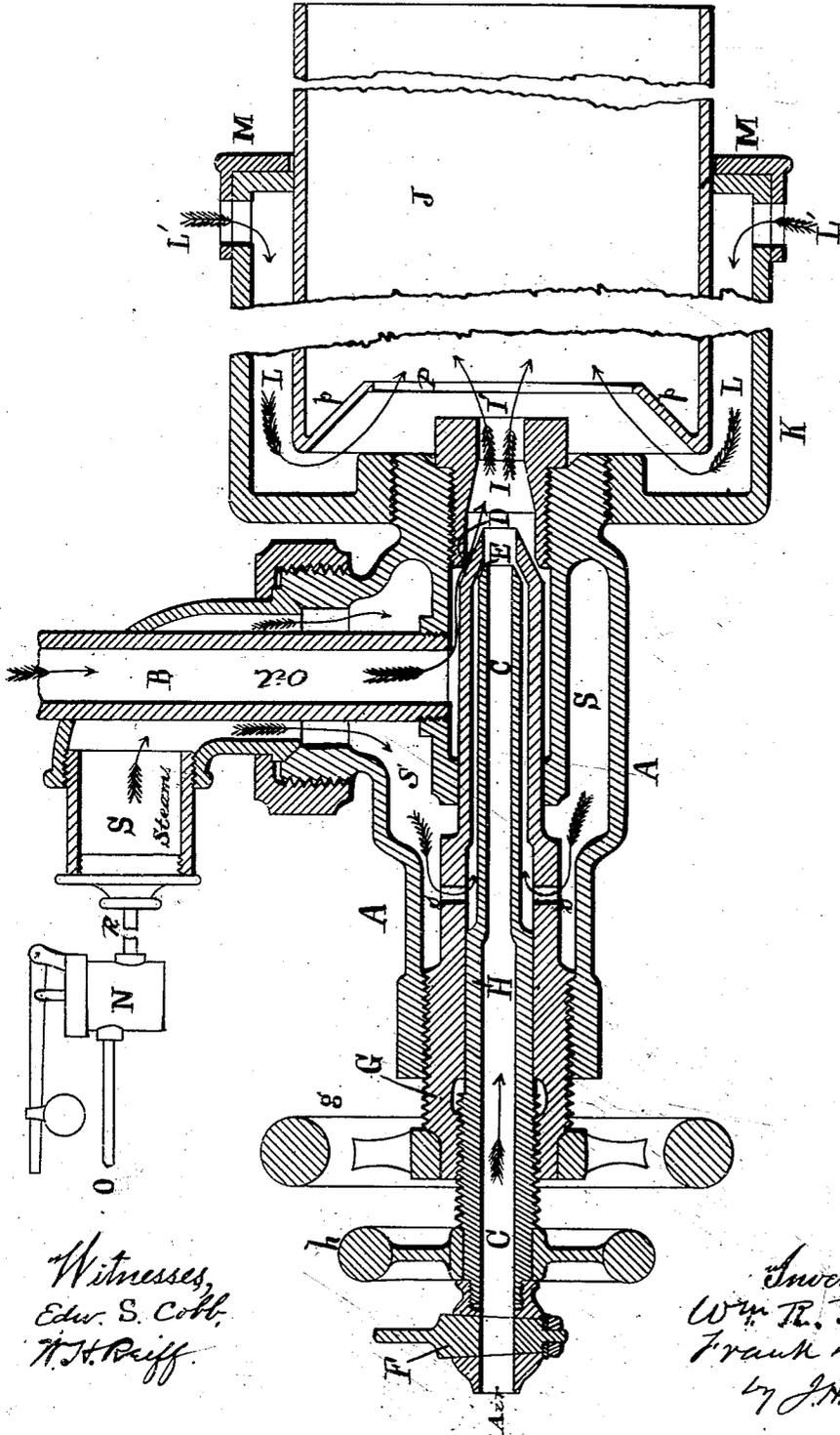
(No Model.)

W. R. PARK & F. D. HEATH.

HYDROCARBON FURNACE.

No. 248,110.

Patented Oct. 11, 1881.



Witnesses,
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UNITED STATES PATENT OFFICE.

WILLIAM R. PARK AND FRANK D. HEATH, OF BOSTON, MASS., ASSIGNOR
TO THE HANCOCK INSPIRATOR COMPANY, OF SAME PLACE.

HYDROCARBON-FURNACE.

SPECIFICATION forming part of Letters Patent No. 248,110, dated October 11, 1881.

Application filed September 6, 1880. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM R. PARK and FRANK D. HEATH, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Hydrocarbon - Furnaces, of which the following is a specification.

Our invention relates to an apparatus for burning hydrocarbons for heating purposes. In apparatus heretofore employed for a similar purpose it has been found necessary, in order to secure the most perfect combustion, to heat separately the elements employed—such as oil, steam, air, &c.—before their ignition, thus necessitating the employment of complicated devices.

In our improved apparatus the several elements are conducted through tubes or passages and combined at their natural temperature, (with the exception in some cases of the oil or tar, which may require to be heated sufficiently to flow freely,) and ignited in a combustion-chamber, the walls of which become heated to such a degree of intensity as to insure a perfect and complete combustion of the combined elements.

Our invention consists in a series of tubes or passages arranged within a shell or casing, in combination with a nozzle and a combustion-chamber, constructed as shown.

It also consists of an additional chamber formed by a jacket or casing surrounding the combustion-chamber, by means of which, if desired, the elements of combustion, either or all of them, may be heated or superheated.

Our invention is illustrated in the accompanying drawing, in which A is the outer shell or casing containing the several tubes and passages.

B is the oil-tube, to be connected with a reservoir suitably located.

Surrounding the oil-tube, and by means of which the oil or other analogous substance is heated, is the steam-passage S, connected with a pipe leading to the boiler.

C is the passage for the supply of atmospheric air.

G is a pipe, into which steam passes through the openings *s s*, and is beveled on its inner end to form a valve, D, having its seat on the

end of the nozzle I. By means of the screw on the pipe G the valve D may be adjusted to regulate the supply of oil as required. *g* is the wheel or handle attached to pipe G.

E is a similar valve formed on the end of tube H, and having its seat on the inner side of the end of pipe G. The opening of valve E is adjusted to regulate the supply of steam by means of the screw on tube H.

F is a stop-cock for regulating the supply of air in tube C.

I I' represent, respectively, a chamber and nozzle at the end of the several tubes or passages B G H, to receive the several elements of combustion and combine or concentrate the same before discharging into the combustion-chamber J.

J is a combustion-chamber, of any required length, and open at its outer end. It is connected to the casing A in any suitable manner, and is provided with a recessed or funnel-shaped opening, P, in front of the nozzle I'. The opening P is formed by an inclined flange, *p*, extending from the inner edge of the chamber J, which flange may be increased or diminished in length, to make the opening P greater or less, as required. The said flange *p* serves to concentrate the several elements passing from the nozzle I, and also to prevent the return of the elements of combustion or flame from the chamber J. The mingled elements—air, oil, steam, &c.—passing from chamber I out of nozzle-opening I', become ignited at or near said opening I', and consequently a high degree of heat is imparted to the walls of chamber J. In order to utilize this heat we surround the chamber J with a casing or jacket, K, closed at its outer end upon the cylinder, provided with openings L' near its outer end, for the admission of air, which passes along through the chamber L, and is drawn into combustion-chamber J by the force of the jet passing out from nozzle I' through opening P, the latter being so proportioned in relation to the said nozzle as to create the proper draft at that point. The quantity of air entering chamber L can be regulated by means of a cap, M, provided with openings to correspond with the openings L', so that the latter may be entirely or partially opened or closed. The chamber

L may also be used for heating the oil by passing the latter through a pipe coiled around the chamber J within chamber L. The coiled pipe may also be used for superheating the steam, or steam may be passed directly through chamber L into chamber J, or each and all the elements may be heated in chamber L at the same time.

The combustion-chamber J may be used without the outer chamber, L. When used together the combustion-chamber casing and the jacket K may be cast in one piece, tapping into chamber L. Ignition takes place within the chamber J, which latter is made of considerable length for the purpose of insuring the ignition and complete combustion of the several elements before passing out of the combustion-chamber into the furnace.

N represents a pressure-regulator, which may be of any known form or construction suitable for use in this connection, and connecting with the steam-passage S by a pipe, R, and with the boiler by a pipe, O, by means of which said pressure-regulator, with a varying pressure on the boiler, the desired pressure may be constantly maintained at the burner. Without a regulator and with a steadily-increasing pressure on the boiler, the burner will increase or burn more and more, accordingly as the steam arises, which should not be the case, for at such time less, rather than more, fuel is required. With a regulator the amount of fuel

and the combustion are steadily maintained without regard to the amount of pressure in the boiler. When the requisite amount of fuel is ascertained the regulator is adjusted to the required pressure to operate the burner, and the proper quantities of oil and air admitted, thus rendering the apparatus automatic in the matter of admitting steam, consequently avoiding the necessity of close attention and manipulation of valves, &c., as when the apparatus is required to be adjusted by hand.

What we claim as our invention is—

1. The chamber J, constructed with the flange *p* and opening P, in combination with a series of pipes or passages, S B C, substantially as and for the purpose set forth.

2. In combination with the combustion-chamber J, constructed as described; the casing K and chamber L, provided with the adjustable openings L', as and for the purpose set forth.

3. The combination of the chamber J, constructed as described, the chamber L, the chamber I, and nozzle I', substantially as and for the purpose set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM R. PARK.
FRANK D. HEATH.

Witnesses:

JOS. H. ADAMS,
EDW. S. COBB.