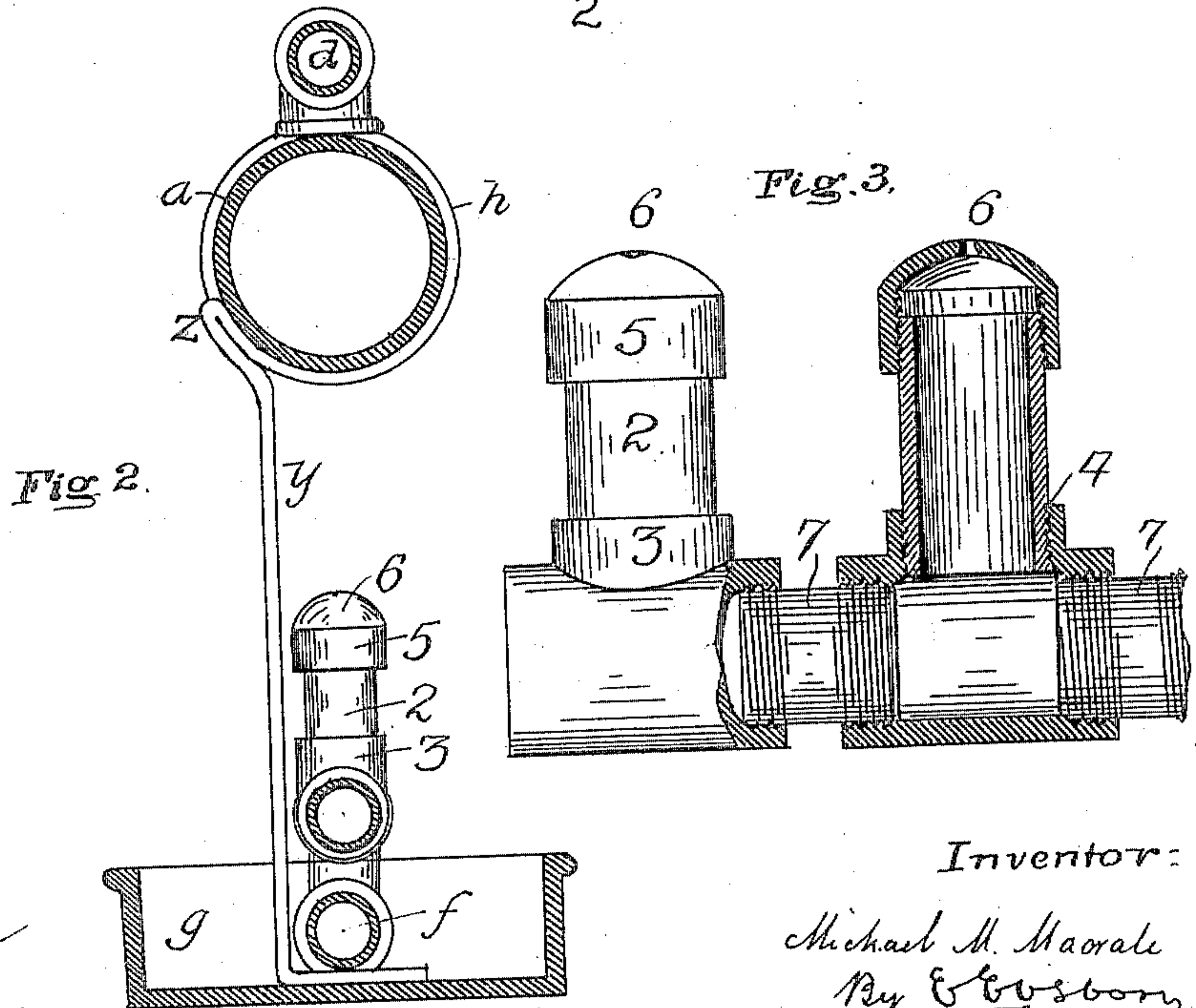
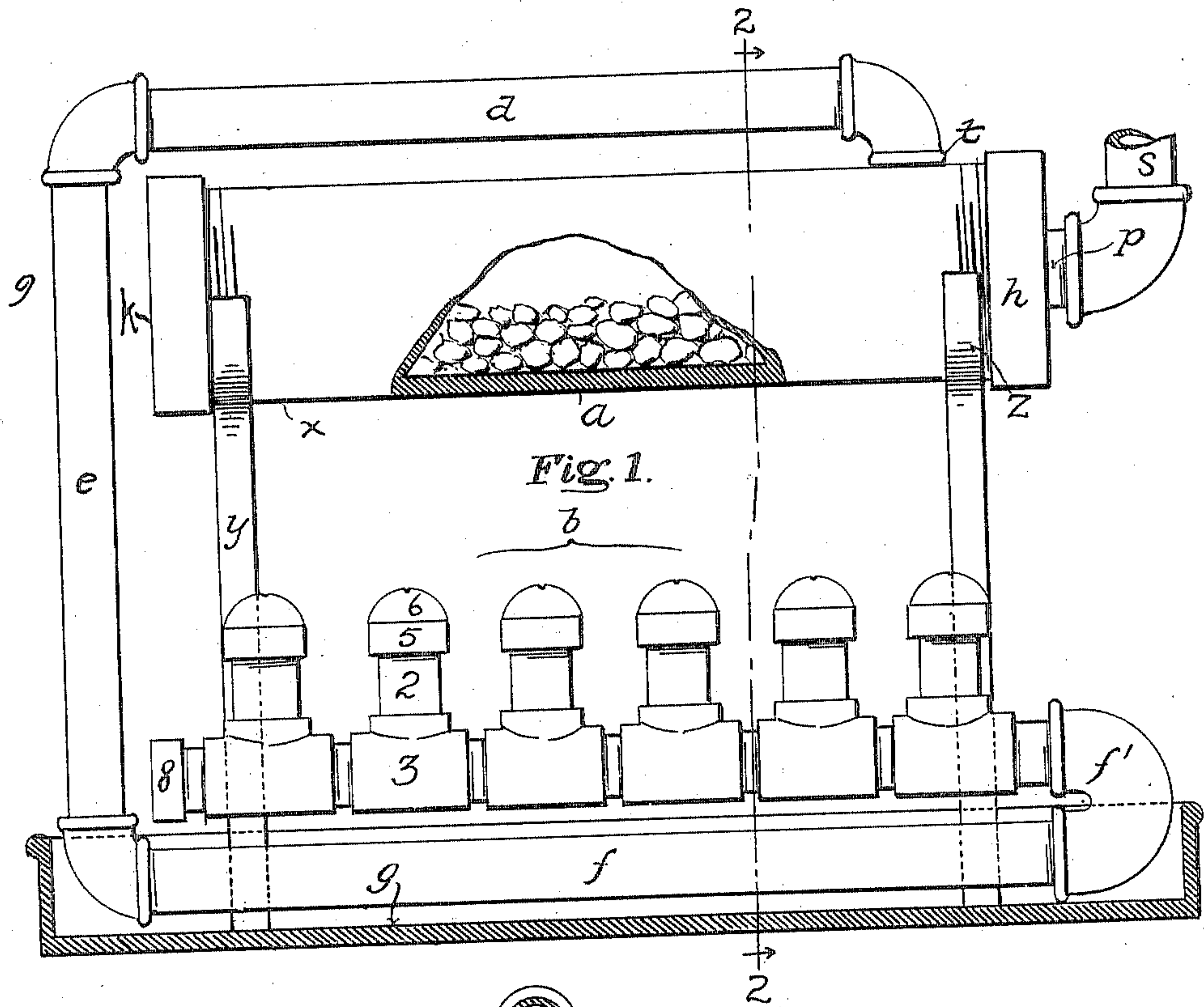


No. 817,128.

PATENTED APR. 3, 1906.

M. M. MACRATE.  
OIL BURNER.

APPLICATION FILED SEPT. 20, 1904.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

MICHAEL N. MACRATE, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR  
TO HIMSELF AND JOHN A. TOOMEY, TRUSTEES, OF SAN FRAN-  
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## OIL-BURNER.

No. 817,128.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed September 20, 1904. Serial No. 225,238.

*To all whom it may concern:*

Be it known that I, MICHAEL N. MACRATE, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

This invention relates to improvements made in the construction of devices for burning oil in furnaces, stoves, and grates; and the invention has for its object chiefly the production of an oil-burner having certain features of construction and certain qualities resulting therefrom that render it particularly adapted for domestic use, either for burning liquid fuel in an open grate or in a fire-box of a stove or a range.

The elimination of a large proportion if not all of the solid carbon which distillates of the lower grades contain and which have been found best suited for household use is one of the important features of this device, the rapid conversion of the liquid into a gaseous form is another, while the peculiar construction and combination of its parts adds to these qualities such a thorough control of the supply of liquid to the generating-chamber directly by the generated gas and in proportion as the same is consumed at the burner-tips that the device is rendered safe and reliable for domestic purposes. The construction also aims to afford ready access to all parts for cleaning or repairs.

To these ends and objects my said invention comprises certain novel construction and combination of generating and separating chamber, burners, and connecting-pipes or conducting and heating passages for the gas, producing an improved oil-burner of the kind or description mentioned.

The accompanying drawings, forming part of this specification and therein referred to by figures and letters, illustrate an oil-burner embodying my invention and adapted for use either in an open grate or in a closed stove. This burner, like all others of its class, is supplied with oil either by feeding it by gravity from a tank or by means of pressure where a proper elevation for a gravity-tank cannot conveniently be had. The supply-tank, however, is not shown in the drawings, for the reason that the same forms no part of this invention.

Figure 1 of the drawings is a front eleva-

tion of my improved oil-burner, showing the side of the generating and separating chamber partly broken away and the firing-pan in longitudinal section. Fig. 2 is a transverse section on line 2 2 of Fig. 1. Fig. 3 is an elevation, on an enlarged scale, of a portion of the burner-tube, showing in detail the construction of the burner-tips, one of the tips being in section.

The principal parts of this burner are herein designated and referred to as the separating and generating chamber *a*, the burner-tube *b*, the gas-conducting pipes *d e f*, and the firing-pan *g*.

The part *a* is a relatively short piece of tubing threaded on the ends, to which are fitted screw-caps *h k*, closing the ends, but also removable therefrom. Within this tube is introduced by removing one of the caps a quantity of some heat-resisting absorbing substance or material, such as pieces of fire-clay or broken pieces of fire-brick, filling the chamber about two-thirds or three-quarters full, the pieces being preferably of irregular and angular shapes, so as to leave interstices instead of being closely packed or of a uniformly-compact condition throughout the mass.

An aperture in one end of the tube *a* is fitted with a threaded nipple *p*, to which is connected the feed-pipe *s*, and a separate opening *t* is provided in the tube *a* for connecting the gas-conducting pipe. This outlet for the gas is best situated in the crown or upper side of the tube *a*, as represented in Fig. 1, and from that point the gas-conductor extends in a horizontal member over the top of the tube *a* to the end and thence downwardly in an upright member *e*. To the lower end of this last-mentioned member the burner-tube *b* is connected by the horizontal member *f*, which latter stands below and parallel with the tube *b* and is connected thereto by an elbow *f'*, as shown, thus causing the gas from the member *e* to flow through the member *f* and elbow *f'* before entering the burner *b* and allowing the greatest latitude for expansion and contraction of parts. This arrangement of the connection between the gas-generating chamber and the burners has the effect to bring the gas-conductor within or in close relation to the region of greatest heat, so that the tube *d* forms practically a continuation of the generating-space in the tube



*a* above the mass of absorbing material and contributes materially to a rapid and complete conversion of the liquid into a gas. This arrangement of the conducting-tube also  
 5 tends to prevent the liquid from being carried over with the gas and is effective in keeping the burner-tips from becoming clogged by the carbonization of deposits from the liquid when so carried into the burner-tips.

10 The burner-tube *b* is composed of a number of tips coupled together and each formed of a pillar 2, a T-coupling 3, in which the pillar is fixed by threaded joint 4, and a detachable cap 5, having a semispherical top with  
 15 an outlet-aperture 6 in the crown. Short threaded sections or nipples 7 between the couplings 3 unite the tips and form the straight burner-tube *b*, and a removable cap 8 on the  
 20 end of the last nipple closes that end and at the same time by being removed it gives access to the burner-tube for cleaning it.

Repairs are readily made to any part of the burner-tube, and one tip can be fitted with a new pillar or a new cap as the same becomes  
 25 burned or injured by the heat without disturbing the others.

The support for this burner when placed in position will obviously vary and be governed by form or character of the grate-surface or  
 30 the furnace in which it is set up. Usually when it is placed in an open grate or fireplace I provide a base in the form of a trough or open pan *g* with uprights *y* ending in open  
 rests *z* for the generating-tube; but where  
 35 the form of the fire-box and other conditions in a furnace or a stove are favorable the burner can be set without the pan and its uprights.

The pan furnishes a convenient means for heating the generating-tube at the time of  
 40 starting the burner by putting a small quantity of the distillate in the pan and igniting it, or where the pan is not used the necessary heat to start the generation of the gas can

be supplied by burning a quantity of shavings or kindling on the grate-surface under 45 the burner and replenishing them until the generating-chamber begins to act.

In the operation of this burner the charge in the generating and separating tube requires to be renewed from time to time, as it 50 takes up and becomes saturated with the solid matter or particles that distillates of the lower grades generally contain in greater or less proportion. By separating and retaining this matter in the generating-tube the 55 burner-tips are kept open and a free and continuous delivery of gas to every tip is insured.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is— 60

A hydrocarbon-burner consisting of a gas-generating cylinder containing a mass of refractory material and having open ends, removable caps for said ends, an inlet in one cap for coupling an oil-feeding pipe to the 65 cylinder, an outlet from the generating-space in the cylinder above the refractory material, a gas-conducting pipe extending from the outlet longitudinally of and over the cylinder, thence downwardly, thence in a horizontal 70 portion standing below said cylinder, a burner-tube connected by an elbow with said horizontal portion and standing above and parallel with it, and a plurality of burners in said tube, each comprising a T-joint coupling threaded internally in its arms, a removable cap with an aperture, and a pillar connecting said cap with the stem of said T-joint, as and for the purpose described. 75

In testimony whereof I have hereunto set 80 my name to this specification in the presence of two subscribing witnesses.

MICHAEL N. MACRATE.

Witnesses:

MAX GRUENBERG,  
 EDWARD E. OSBORN.