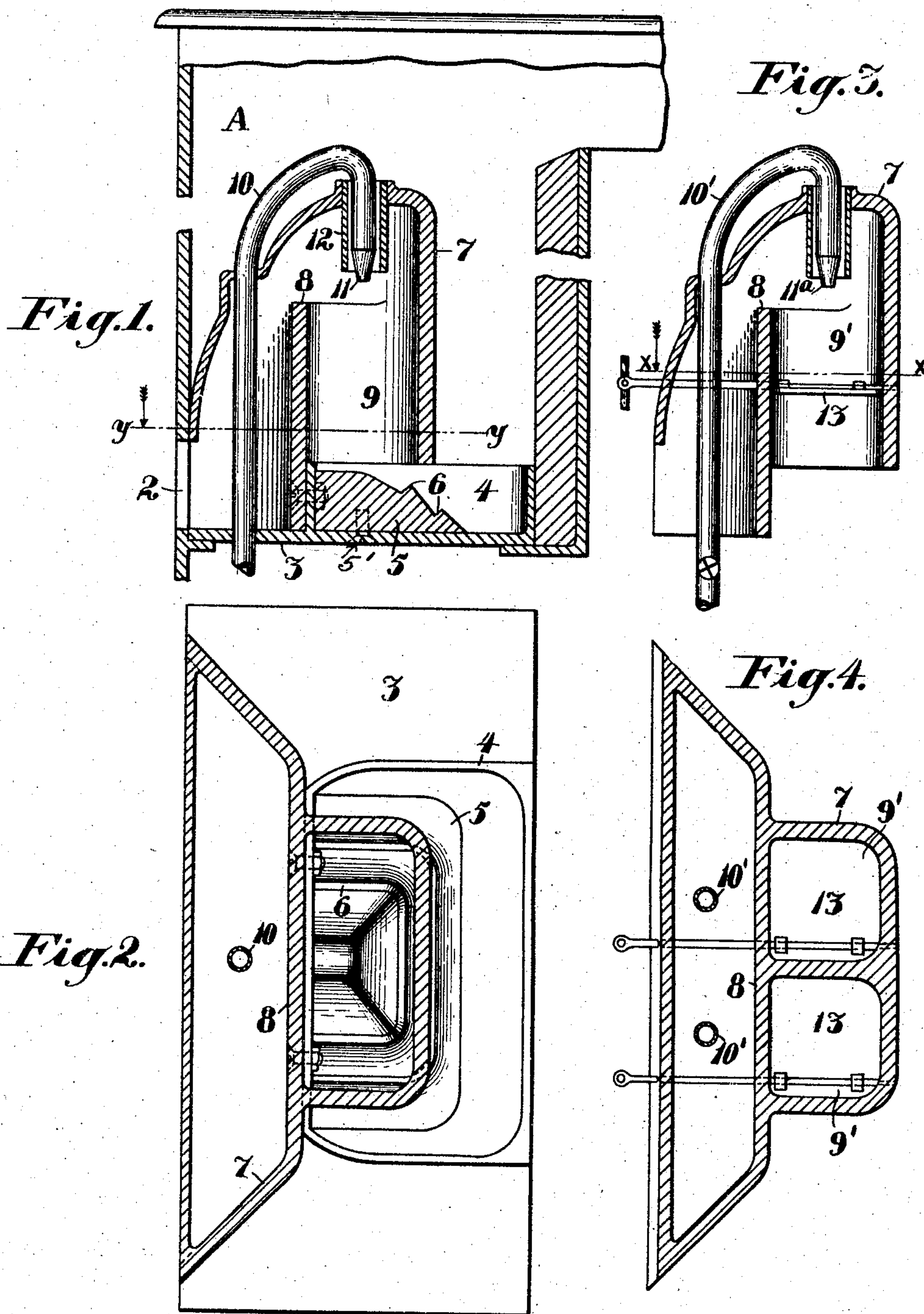


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PATENTED JAN. 31, 1905.

J. H. DAVIS.
OIL BURNER.

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Witnesses:-

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UNITED STATES PATENT OFFICE.

JOHN H. DAVIS, OF OAKLAND, CALIFORNIA:

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 781,331, dated January 31, 1905.

Application filed March 23, 1904. Serial No. 199,620.

To all whom it may concern:

Be it known that I, JOHN H. DAVIS, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Oil-Burners, of which the following is a specification.

My invention relates to improvements in liquid and gaseous fuel-burners designed for use particularly in stoves and grates. Its object is to provide a cheap, simple, and practical burner for heavy oils which may be applied to stoves or furnaces already in use, which is not apt to carbonize, which will permit a regulation of the amount of heat, and which will produce a steady, broad, and smokeless flame.

It consists of the parts and the construction and combination of parts, as hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is a vertical section of burner in fire-box. Fig. 2 is a section on line *y y* of Fig. 1. Fig. 3 is a vertical section of double burner. Fig. 4 is a section on line *x x* of Fig. 3.

A represents the fire-box of an ordinary stove with the usual draft-regulated opening 2. About opposite and on a level with the opening 2 I dispose a plate 3, entirely cutting off all air from below. This plate has a suitable pan 4, with a removable inner bottom plate 5, inclining pyramidal form upward at one side of the pan, the three sides of the incline being suitably channeled or corrugated, as at 6. The removal of the plate may be effected by any well-known means, as by the screw 5' passing through the pan and into said plate. Suitably secured within the fire-box is a hood 7, of peculiar design, having its rear portion open to the air-passage 2, whence air is admitted and directed upward back of pan 4, by reason of a vertical partition-plate 8, and then deflected downward through the flue 9, directly upon the inclined surfaces of plate 5. As here shown, the hood 7 has its back portion, or that portion contiguous to the front of the fire-box, substantially coextensive in length with the latter, so that air may be taken in clear across the opening 2. The

front of the hood, inclosing flue 9, is contracted to substantially the length of the pan 4, so that the draft is concentrated at this point. The bottom of the hood comes close to the plate 3 to prevent ingress of air except as it may pass up behind and over partition 8 and down through flue 9. For convenience the hood is shown as supported by being screwed to pan 4.

Oil is fed to the burner by a pipe 10, which passes up through plate 3 rearward of partition 8, through the top of the hood, and returning through the hood to discharge centrally into flue 9 upon the inclined surface of plate 5 and preferably at a point above the upper edge of partition 8. By this construction the oil-pipe is entirely out of the fire, and danger of clogging of the pipe by carbonization is avoided, the air-induction passage forming, in fact, an air-jacket for the oil-pipe. By having the oil-discharge at a point above the partition 8 the tip 11 of pipe 10 is cooled by the constant indraft entering through opening 2 and the oil is prevented from igniting at that point. The oil dropping on the pyramidal surface of the pan is flashed into vapor and ignited. The air passing down through shaft 9 commingles with the vapor to effect a perfect combustion. Without any forced draft an intense fire is created, which spreads out on three sides beneath the hood and practically fills the fire-box with flame. The fire reacts on the hood to heat the walls of shaft 9, so that the air and falling oil are in heated condition when they strike the plate. The pyramidal surface of plate 5 deflects the air and vapors outward into the fire-box to prevent rebound of the vapors back into the hood, which would cause a disagreeable puffing and a fluctuating flame. By running the oil-pipe up through the cooler air-passage in the hood and out of all contact with the flame all liability of the oil to bake or carbonize in the pipe is obviated.

Should the pan need cleaning out at any time, the removable bottom 5 may be taken out, scraped, and replaced without disturbing the rest of the burner.

As it might be necessary on occasion to lift off a lid and in so doing check the force of the

indraft through opening 2, or it may be desired to cut down the fire by otherwise decreasing the draft, I provide a safeguard against the tendency of the flame under such
 5 circumstances to jump to the tip 11. This consists of a short section of pipe 12, a trifle larger than and surrounding pipe 10, open to the atmosphere above the hood and terminating at or adjacent to tip 11. This section 12
 10 forms an air-jacket down through which a thin annular layer of cool air is induced, sufficient only to keep the oil below the point of ignition till after it leaves the tip. Ordinarily, however, as before stated, when the burner is
 15 operating normally the indraft through opening 2 is such as to keep down the temperature of the tip. The use of the sleeve 12 allows the burner to be throttled down to a trifling flame.

20 The burner may be of any suitable size and is adapted for use in furnaces and places other than stoves, as here illustrated.

In Fig. 3 I have shown a double burner, which under some circumstances may be operated
 25 more economically than a single larger burner. In this case what was a single flue in Fig. 1 is here divided into two or more flues, as 9', each with a separate oil-feed 10' and tip 11^a, while the drip-pan is constructed to correspond.
 30 The size of the fire may be regulated by a damper 13 in each of the flues 9'. If a small fire is wanted the oil from one of the pipes 10' is cut off and the corresponding damper 13 shut down, since air should be admitted only in
 35 proportion to the oil consumption and at points relative to the source of oil-vapor.

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

40 1. An oil-burner comprising a drip-pan, a plurality of air-conduits each comprising vertical portions connected at the top, one of said portions open to the atmosphere and the other adapted to discharge upon the pan, an oil-feed
 45 pipe within each of said conduits said pipe passing up through the portion of the conduit which is open to the atmosphere and having a reëntrant portion passing into the other portion of said conduit and terminating at a
 50 point above the wall which separates the two portions whereby said reëntrant portion is cooled by the indraft from the passage which is open to the atmosphere, said oil-pipes adapted to discharge upon the pan, and dampers in
 55 said conduits.

2. An oil-burner comprising a drip-pan having a removable inner bottom plate, said plate provided with a protuberant corrugated portion, an air-conduit comprising vertical portions
 60 connected at the top, one of said portions open to the atmosphere and the other adapted to discharge upon the said protuberant portion of the plate, and an oil-feed passing through the portion of the conduit which
 65 is open to the atmosphere and having a re-

entrant portion terminating in the connected portion of the conduit above the dividing-wall thereof whereby it is protected by the air-currents against carbonization.

3. An oil-burner comprising a drip-pan, an
 70 air-conduit comprising vertical portions connected at the top, one of said portions having an air-inlet and the other adapted to discharge upon the pan, an oil-feed pipe passing up through the portion of the conduit to which
 75 air is admitted said oil-pipe having a portion entering the other portion of the conduit and terminating relatively remote from the pan and above the dividing-wall between said portions
 80 whereby the oil as it leaves the pipe meets the indraft from the air-conduit and is maintained at a temperature below the normal point of ignition.

4. An oil-burner comprising a drip-pan, an
 85 air-conduit having vertical portions connected at the top, one of said portions having an air-inlet and the other portion adapted to discharge upon the pan, and an oil-pipe passing up through portion of the conduit to which air
 90 is admitted and thence returning and entering the other portion of the conduit and terminating in the connected upper portion thereof above the dividing-wall of said portions and substantially in the plane of the air-currents
 95 passing from one portion of the conduit to the other, said oil-pipe adapted to discharge upon the pan.

5. An oil-burner comprising a pan, a hood associated therewith having induction and
 100 eduction passages, said eduction-passage arranged to discharge upon the pan, an oil-pipe in the induction-passage and having a discharge into the eduction-passage and upon the pan, and a damper in said induction-passage.

6. An oil-burner comprising a pan, a hood
 105 associated therewith and having an air-passage comprising vertical portions connected at the top, one of said portions open to the atmosphere and the other adapted to discharge upon the pan, an oil-pipe passing up through the
 110 portion of the passage which is open to the atmosphere, and having an outlet adjacent to the upper end of said discharge portion, and means for delivering a relatively thin annular layer of air immediately adjacent to said oil-
 115 outlet.

7. An oil-burner comprising a pan, a hood associated therewith and having an air-pas-
 120 sage comprising vertical portions connected at the top, an oil-pipe passing up through one of said portions, through the hood and having a reëntrant portion passing into the other portion and arranged to discharge upon the pan, and means independent of said portions
 125 for delivering a limited amount of air immediately adjacent to the outlet of said oil-pipe.

8. An oil-burner comprising a pan, a hood associated therewith and having an air-pas-
 130 sage comprising vertical portions connected at the top, an oil-pipe passing up through one

of said portions, through the hood and having a reëtrant portion passing into the other portion and arranged to discharge upon the pan, and means independent of said portions for delivering a limited amount of air immediately adjacent to the outlet of said oil-pipe, said means including a section of pipe surrounding said reëtrant portion and out of contact therewith and open at both ends.

9. The combination with a fire-box having a draft-opening at one side, of a plate in said fire-box, a pan on said plate, means inclosing an air-passage between said draft-opening and pan, said air-passage connected laterally with

the said draft-opening and arranged to have a downward discharge on said pan, and an oil-pipe in said passage and having its point of discharge above the wall which separates the portions of the passage whereby it is protected by the draft from carbonization and having a discharge within the passage and upon the pan.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN H. DAVIS.

Witnesses:

S. H. NOURSE,
D. B. RICHARDS.