

No. 698,467.

Patented Apr. 29, 1902.

B. G. DEVOE.

OIL BURNER.

(Application filed July 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

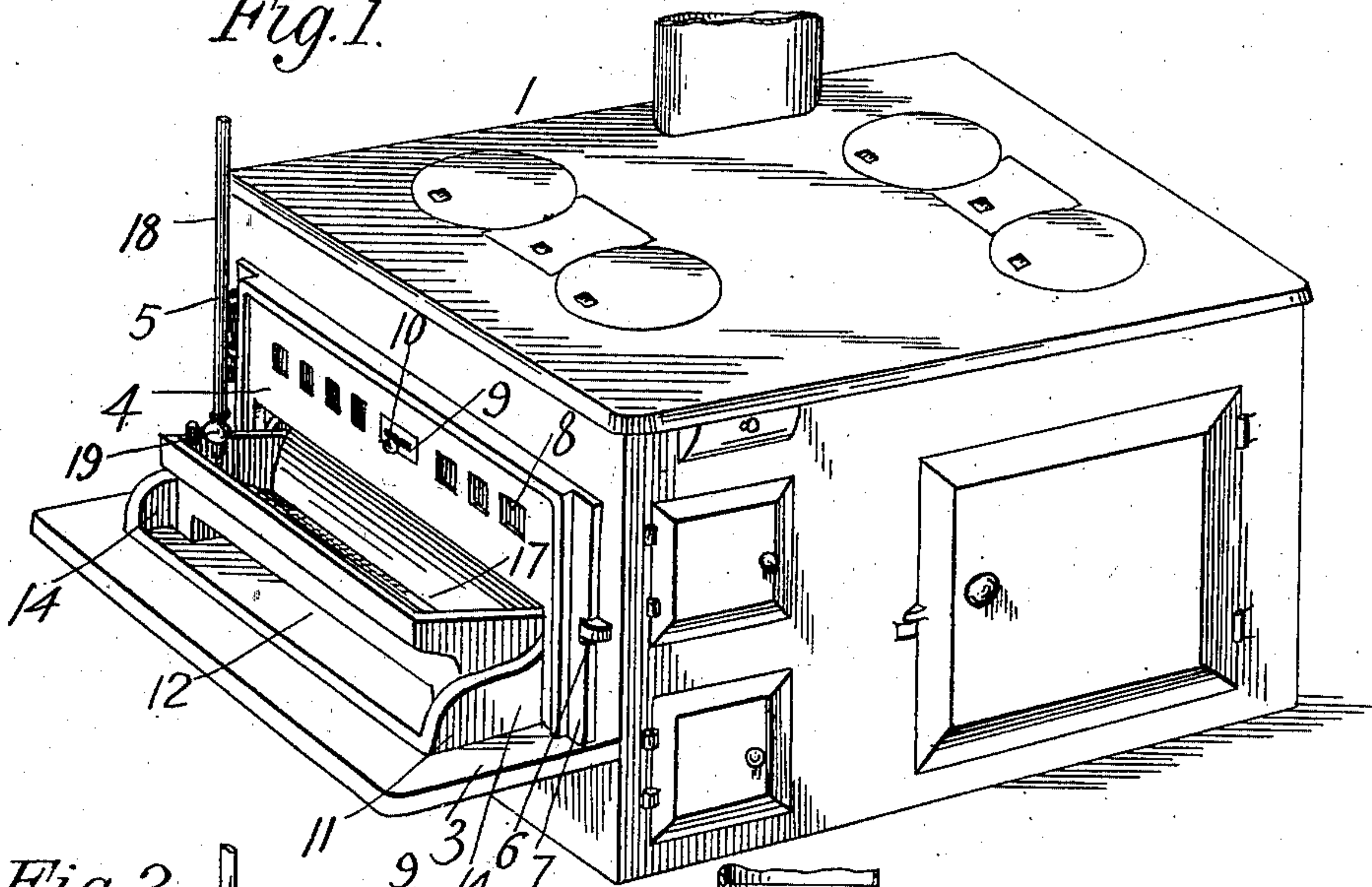


Fig. 2.

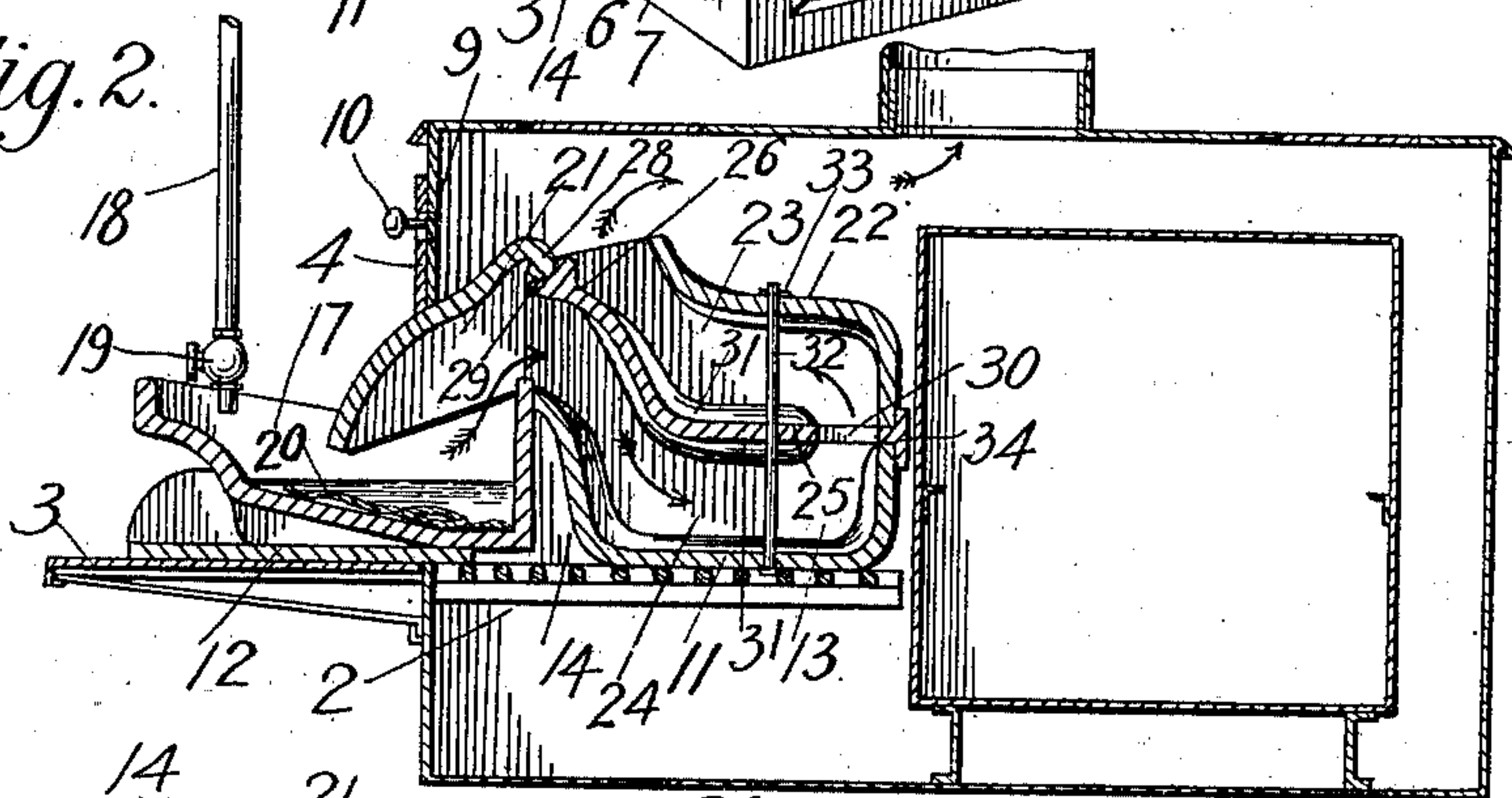
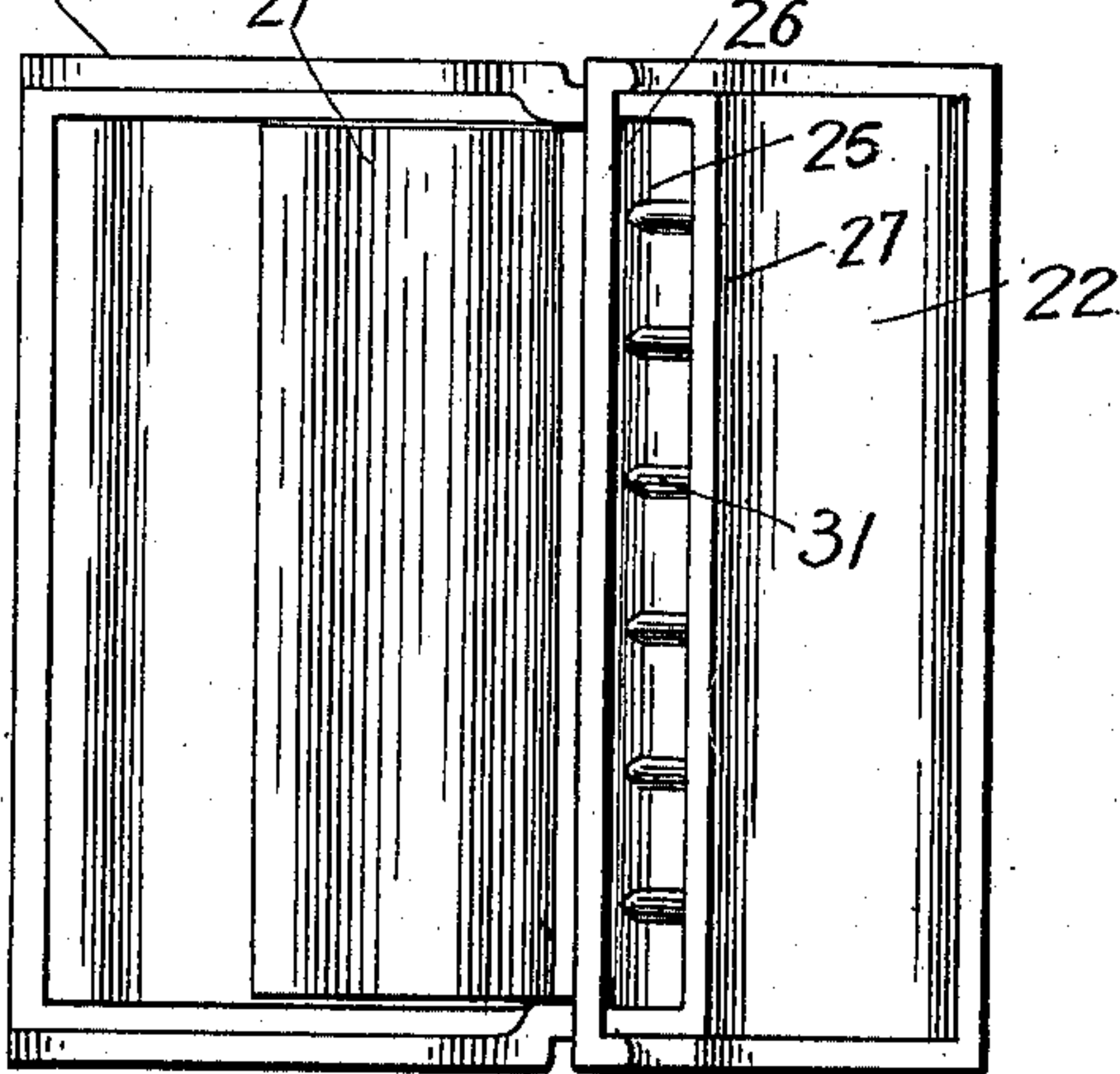


Fig. 3.



Inventor
B. G. Devoe

Witnesses:
J. S. Bowen
J. H. Wilson

By A. B. Wilson & Co.
Attorneys

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2 Sheets—Sheet 2.

(No Model.)

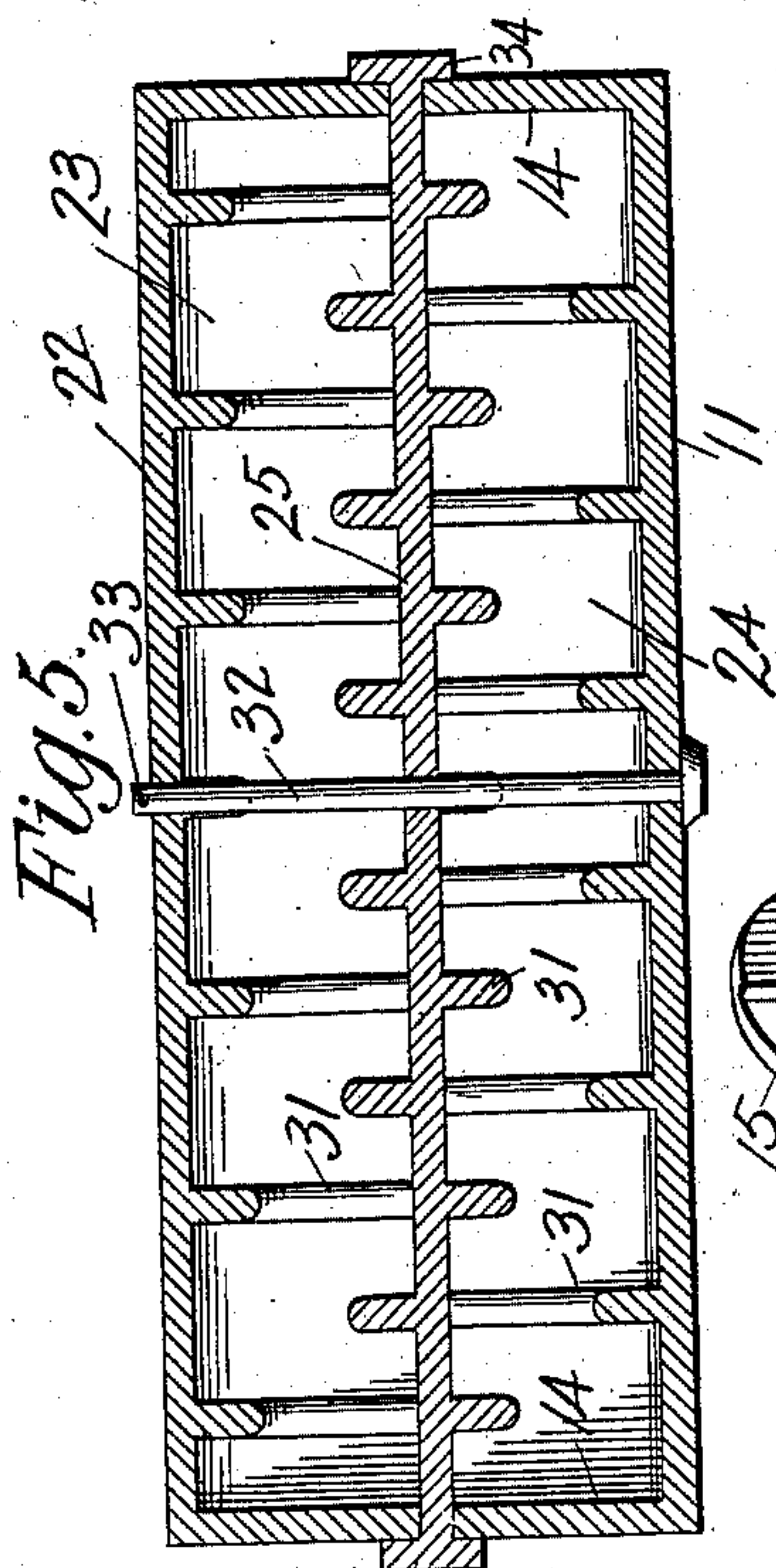


Fig. 5.

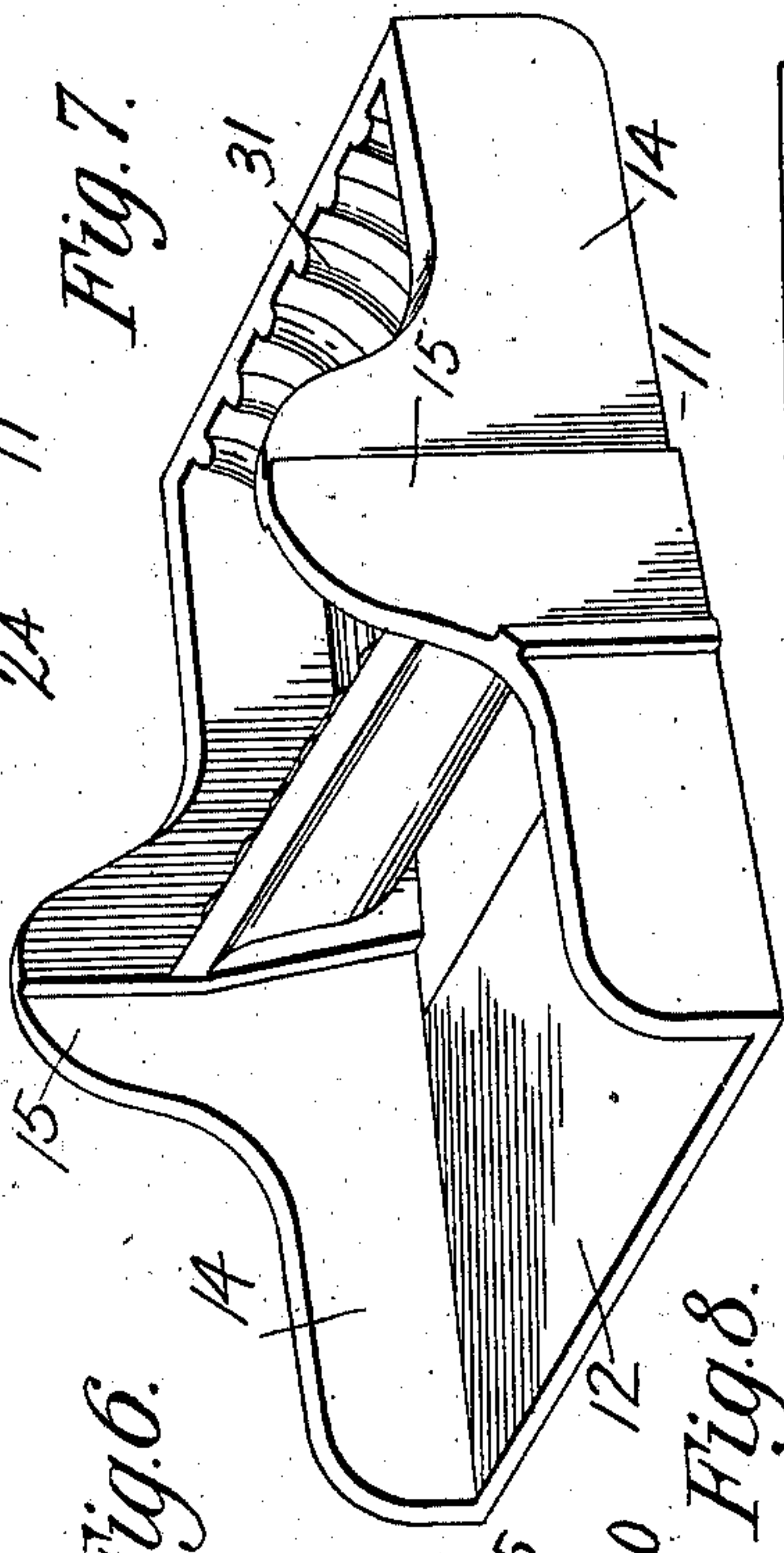


Fig. 6.

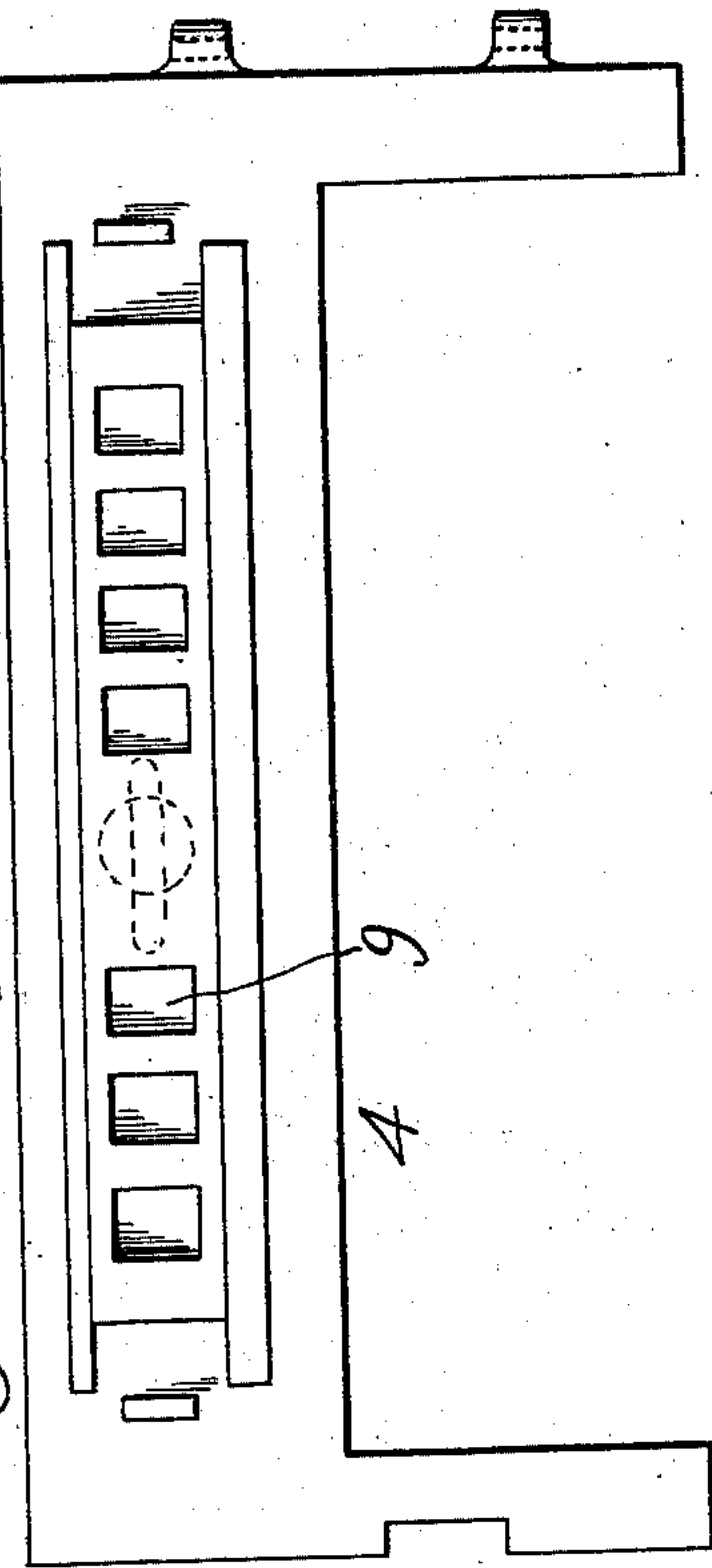


Fig. 8.

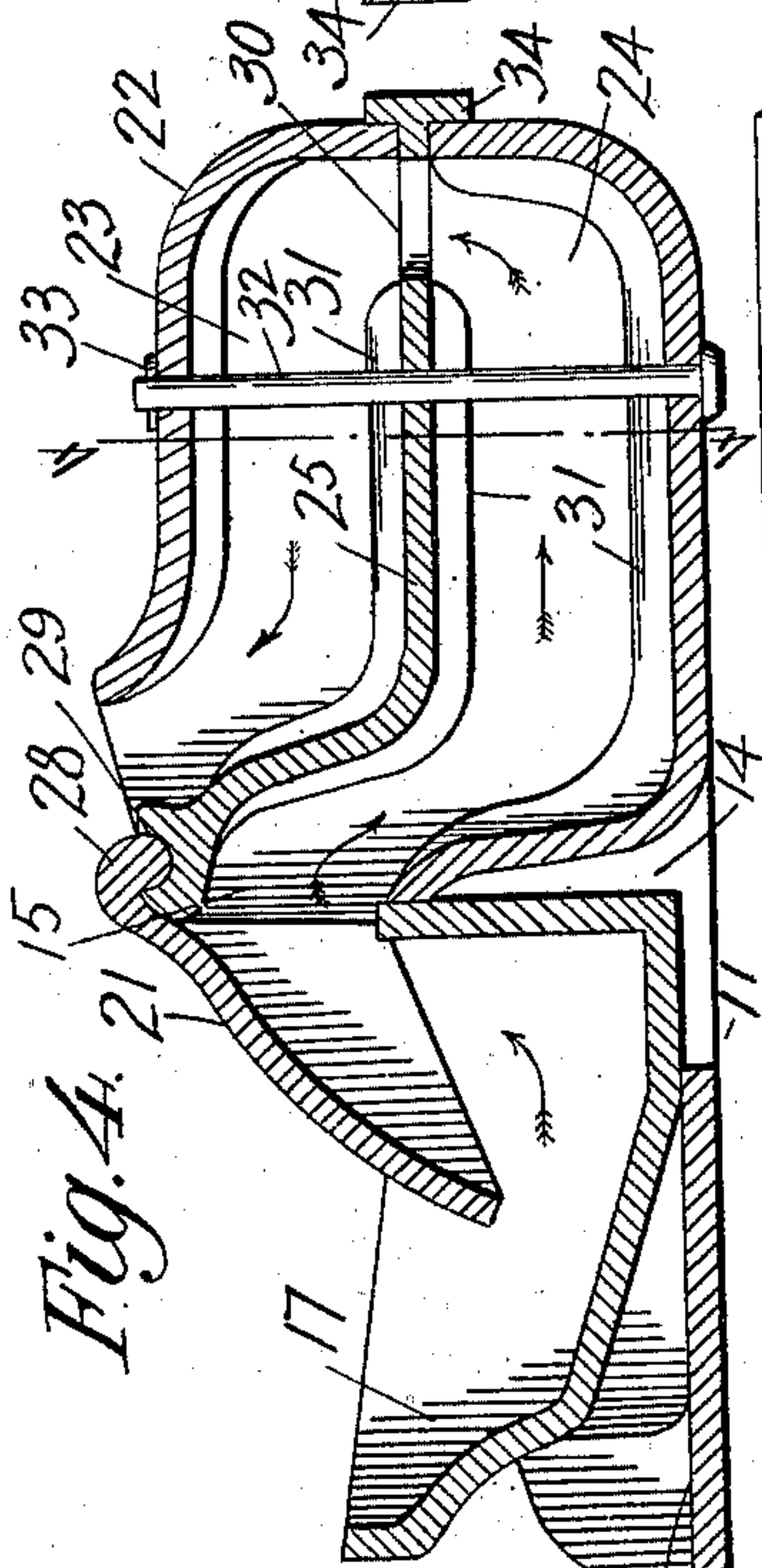


Fig. 4.

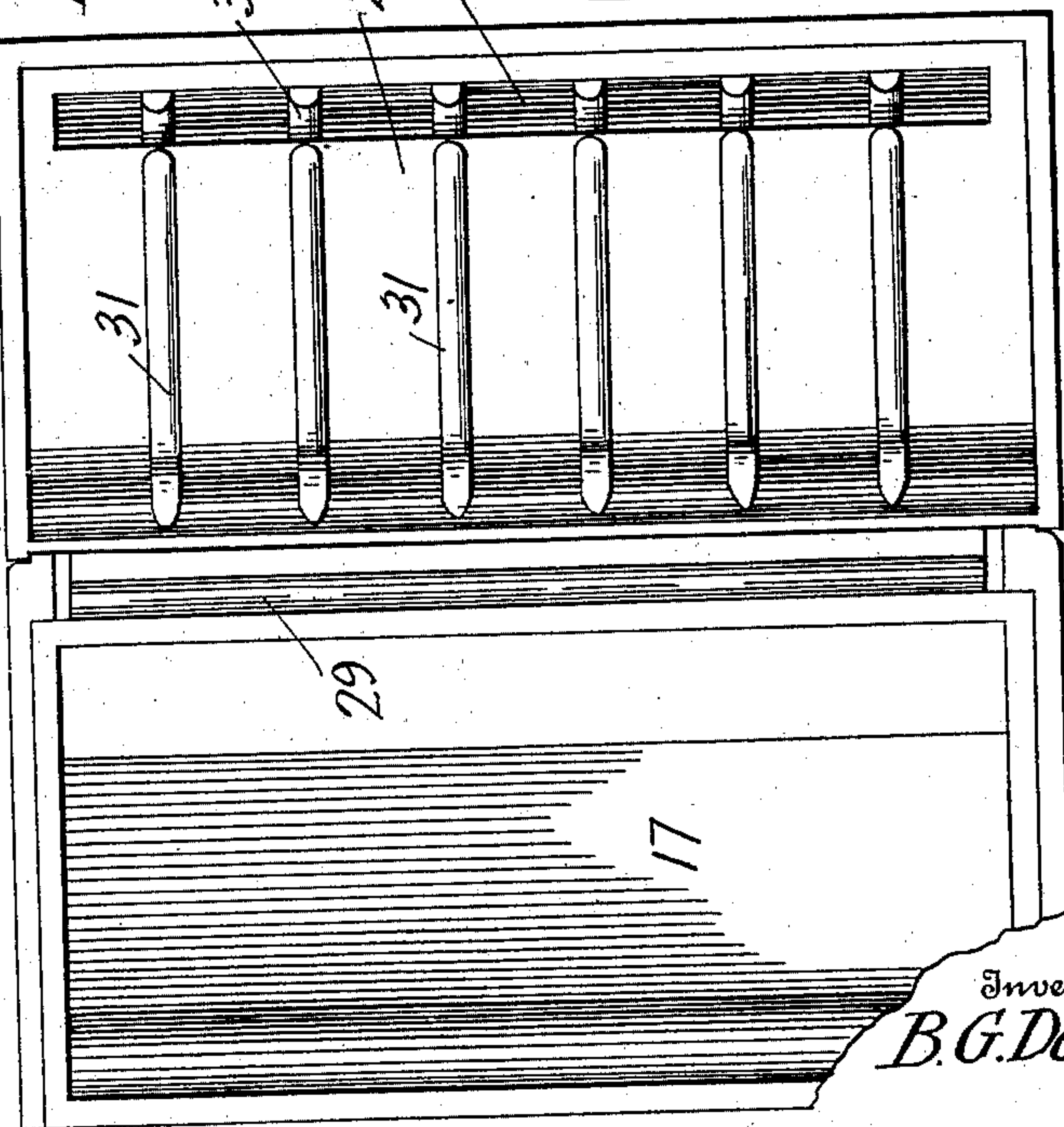


Fig. 7.

Witnesses:
J. P. Bowen
J. H. Wilson

By *A. B. Wilson & Co.*
Attorneys

Inventor
B. G. Devoe

UNITED STATES PATENT OFFICE.

BENJAMIN G. DEVOE, OF LIMA, OHIO.

OIL-BURNER.

SPECIFICATION forming part of Letters Patent No. 698,467, dated April 29, 1902.

Application filed July 15, 1901. Serial No. 68,362. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN G. DEVOE, a citizen of the United States, residing at Lima, in the county of Allen and State of Ohio, have
5 invented certain new and useful Improvements in Oil-Burners; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it apper-
10 tains to make and use the same.

This invention relates to improvements in hydrocarbon-oil burners for use in heating and cooking stoves, furnaces, &c.

The object of the invention is to provide a
15 burner of this character which shall be simple, cheap, and durable in construction, efficient in operation, which is composed of a minimum number of parts, which may be readily taken apart for cleansing and repairs,
20 and which dispenses with the use of pipes and other parts which are liable to become clogged by residuum or injuriously affected by a high degree of heat.

With this and other objects in view the invention consists of certain novel features of construction, combination, and arrangement of parts, as will be hereinafter more fully described, and particularly pointed out in the appended claims.

30 In the accompanying drawings, Figure 1 is a perspective view of a portion of a cooking stove or range, showing the application of the invention thereto. Fig. 2 is a vertical longitudinal section of the same. Fig. 3 is a top
35 plan view of the burner removed from the stove. Fig. 4 is a longitudinal section through the burner on a larger scale than in Fig. 2. Fig. 5 is a cross-section through the combustion-chamber on line 5 5 of Fig. 4. Fig. 6 is
40 a top plan view of the burner with the hood and the cover of the combustion-chamber removed. Fig. 7 is a perspective view of the burner base and frame, and Fig. 8 is a rear elevation of the draft-door.

45 Referring now more particularly to the drawings, the numeral 1 designates a cooking-stove of any ordinary or preferred construction, the same being provided with a fire-box 2 and with a hearth or shelf 3 at one end
50 thereof, which shelf is arranged at the base of a draft-opening formed in the end wall of the stove. This opening is ordinarily closed

by a hinged door, which is opened and closed to increase and decrease the draft, as desired. In carrying my invention into practice I substitute for the ordinary form of door a door 4,
55 which closes only the upper portion of the draft-opening, leaving a space below of sufficient size to receive the burner, which projects into the fire-box of the stove. The door 60
4 is hinged at one end in the usual manner by the rod or pintle 5 to the wall of the stove and is provided with a slot or recess at its opposite side to engage a catch 6 on the stove, whereby said door may be held closed. At
65 each side the door is provided with downwardly-projecting legs 7, which are adapted to seal or close the spaces between the wall of the stove and the end walls of the burner to prevent the escape of heat or the access of
70 air to the stove except through the proper channel. The upper portion of the door is formed or provided with a longitudinal series of perforations 8, regulated by a sliding valve or damper 9, having a finger-piece 10 project-
75 ing to the exterior, whereby it may be adjusted to close said openings to stop the draft or to open them to any desired extent to admit a greater or less supply of air to the stove to support combustion, as desired. 80

The burner comprises in its construction a base-frame 11, consisting of a front base or supporting plate 12, a trough or pan 13, which forms the body or bottom section of the combustion-chamber, and side walls 14, which are
85 enlarged at 15 between the plate 12 and front wall of said pan 13. The said front wall 16 of the pan 13 is curved upwardly and forwardly above the plane of the rear wall thereof and connects with the enlargements 15 of
90 the sides 14.

Supported by the plate 12 is an oil pan or reservoir 17, which is removable and is of such size as to fit snugly between the front ends of the sides 14 and to bear against the front surface of the wall 16. This oil-pan forms the
95 fire-box of the burner and is supplied with oil from a supply-pipe 18, having a feed-valve 19, preferably of globe form, which may be regulated to feed the oil to the pan in quantities
100 corresponding to the amount required for consumption to produce a given degree of heat. A wick 20, of asbestos or other suitable material, may be placed in the oil-pan, if desired.

The upper rear portion of the oil-pan is closed by a segment-shaped hood or deflector 21, which projects downwardly a short distance into the pan and fits snugly between the side walls of said pan to form a channel regulating the supply of air through the open space at the front of the pan to the space beneath said hood or deflector and thence to the combustion-chamber, hereinafter described. The trough or pan 13 is closed at top by a removable cover-section 22 to form a combustion-chamber through which the heat and flames from the fire-box circulate before passing into the fire-box of the stove. This combustion-chamber is divided to form upper and lower flues or passages 23 and 24 by a horizontal partition-plate 25, which has a front wall 26, curving upwardly and forwardly between the curved front wall 16 of the trough 13 and the correspondingly upwardly curved wall 27 of the cover 22, thus forming an inlet to said lower passage 24 and an outlet from the upper passage 23 to the interior of the stove. This outlet may or may not be provided with a slide or damper for controlling the draft, as desired. The hood 21 is provided at its rear edge with a rounded rib 28, which is adapted to fit within a corresponding groove or recess 29, formed in the said front edge of the front wall 26 of the partition-plate 25, whereby said hood is supported in position and is allowed to have a limited hinge action to provide for the insertion and removal of the oil-pan 17 in the manner hereinafter described. The two passages 23 and 24 of the combustion-chamber are in communication at the rear end of the burner through a slot or passage 30, formed in the partition 25. The upper surface of the trough 13, the under surface of the cover 22, and both sides or surfaces of the partition 25 are formed with longitudinal ribs or projections 31, the ribs or projections upon the partition being arranged to come on lines between the partitions of the bottom trough of the combustion-chamber and the cover-section thereof, so as to form a series of flues or passages for the circulation of the flames and products of combustion from the oil-pan and fire-box 17 and to provide also additional surfaces for the storage up of heat to place the unconsumed products of combustion into the best possible condition for complete or practically complete consumption. The cover 22 is held in position by a bolt or key 32, passed through the bottom wall of the trough 13, the partition 25, and through said cover, and having at its lower end a head to bear against the bottom of the trough and formed at its upper end with an opening for the reception of a pin or key 33 to retain said bolt in position and prevent displacement of the cover, while the partition is provided around its side and rear edges with a flange 34, which bears against the outer surfaces of the side and rear walls of the bottom section 13 of the combustion-chamber and retains said partition against displacement. It will thus be seen that the

parts of the burner are few in number, detachably connected in a simple and effective manner, so as to be readily disconnectible for cleaning or repairs, and that but one fastening device—namely, the pin or bolt 32—is employed, this, unlike bolts and nuts or other fastenings, being readily and conveniently removable and easily replaceable when burned out, warped, or otherwise rendered useless by the action of heat.

As clearly shown in Figs. 1 and 2, the burner is supported within the fire-box of the stove and projects to the exterior through the space or opening in the base portion of the door 4, so that the oil-pan 17 is exposed upon the exterior for the ready feed of oil thereto from the supply-pipe 18 and for its convenient insertion and removal for cleaning or repairs. It will be seen that the legs 7 of the door 4 rest in contact with beads or strips 34 upon the side pieces of the burner-frame, so as to close all inlets or crevices at these points to prevent interference with the proper draft through the opening 8, controlled by the sliding damper 9.

In operation oil from the supply-pipe 18 is fed through the globe-valve 19 into the oil-pan 17 and is ignited, the flames, smoke, and products of combustion, together with the air drawn in through the open front top portion of the pan 20, passing to the rear beneath the hood 21 and thence through the passage 24 to the rear of the base of the combustion-chamber, thence up through the slot or opening 30 into the passage 23, and out into the fire-box of the stove through the outlet between the curved front walls of the cover 22 and partition 25. In thus passing through the combustion-chamber the flames are brought into contact with the partition 25, which forms a flame-plate and heats said partition to a white heat, whereby the heavy hydrocarbon vapor and smoky flames after having been oxygenated by the air entering the oil-pan and fire-box are brought into direct contact with an incandescent surface and entirely consumed, producing a flame of intense heat. I am thereby enabled to burn crude oil without the objectionable hissing noise ordinarily produced and with little or no loss of combustible elements.

By simply tilting the forward end of the oil-pan 17 upwardly and pulling it outwardly said pan may be readily and quickly removed for cleaning purposes without disturbing the hood 21, and after cleaning the pan may be restored to its original position by inclining or tilting it in the manner stated and forcing it under the hood, which yields to allow it to assume its proper position.

The great advantage of my burner herein described is that it is composed of comparatively few parts, which may be readily assembled and disassembled, and in dispensing with the use of pipes and other similar parts, which are liable under the intense heat to warp, carbonize, or to become otherwise in-

juriously affected, thus rendering the burner uncertain in action and expensive to construct and to maintain in repair.

By simply removing the door 4 the burner 5 may be drawn out and the parts of the combustion-chamber disassembled for the cleaning out of any deposit or residuum of burned oil and also for convenience for repairing.

The burner is adapted for use in cooking 10 and heating stoves of various kinds and for various types of furnaces without materially altering the construction or departing from the essential features of the invention.

Having thus fully described my invention, 15 what I claim as new, and desire to secure by Letters Patent, is—

1. A hydrocarbon-oil burner having a combustion-chamber subdivided by a flame-plate forming bottom and top inlet and outlet passages in communication at one end of the 20 chamber, an oil-receptacle in communication with the inlet-passage at the other end of the chamber, and a hood guarding said inlet-opening and partially overhanging said receptacle for regulating the inner draft of air 25 through the said inlet-passage, substantially as and for the purpose set forth.

2. A hydrocarbon-oil burner comprising a 30 base having a trough forming the lower portion of a combustion-chamber, a cover closing the trough and forming the upper portion of the combustion-chamber, a partition subdividing said chamber to form upper and lower passages in communication at one end 35 and provided, respectively, at the other end with an inlet and outlet, an oil-pan resting upon the base adjacent to said inlet, and a

hood or deflector for conducting the indrawn air and the products of combustion from the oil-pan to said inlet, the said parts being 40 detachably connected, substantially as described.

3. A hydrocarbon-oil burner having a combustion-chamber divided by a flame-plate to form inlet and outlet passages located one 45 above the other, said passages being in communication at one end of the chamber and having their inlet and outlet openings located at the opposite end of the chamber, an oil-reservoir, and a hood partially overhanging 50 the oil-reservoir for conducting the air and products of combustion therefrom to the inlet-opening of said inlet-passage, substantially as and for the purpose specified.

4. A hydrocarbon-oil burner comprising a 55 base having a trough forming the lower portion of a combustion-chamber, a cover closing the trough and forming the upper portion of the combustion-chamber, and a partition forming a flame-plate and separating said 60 lower and upper portions of the chamber to form inlet and outlet passages, said passages being in communication at one end of the chamber and having their inlet and outlet openings at the opposite end of the chamber, 65 substantially as described.

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

BENJAMIN G. DEVOE.

Witnesses:

FRANK E. MEAD,
ED. G. WERTZ.