

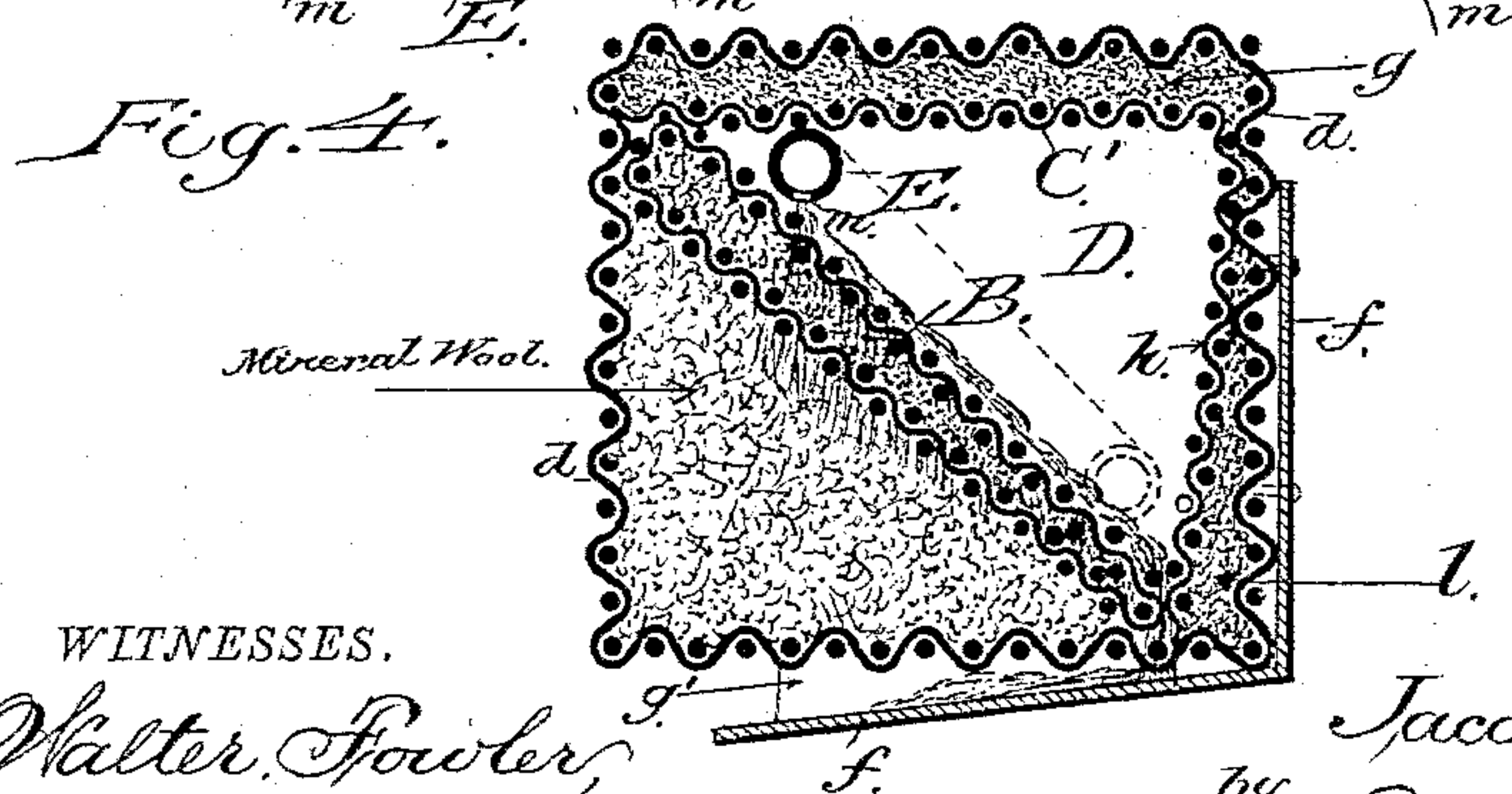
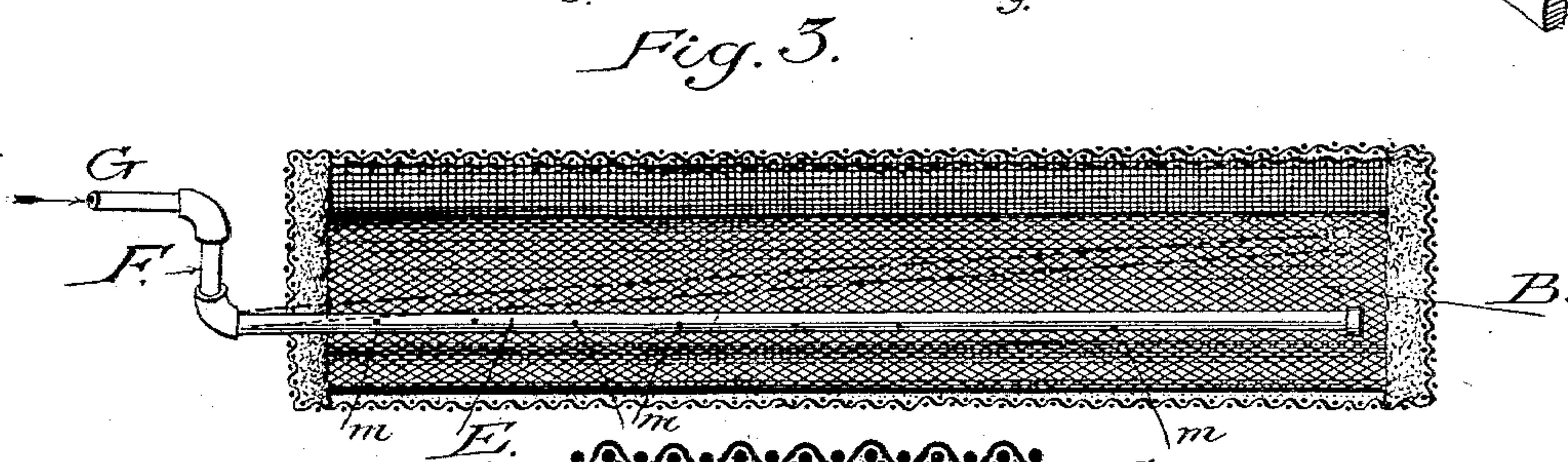
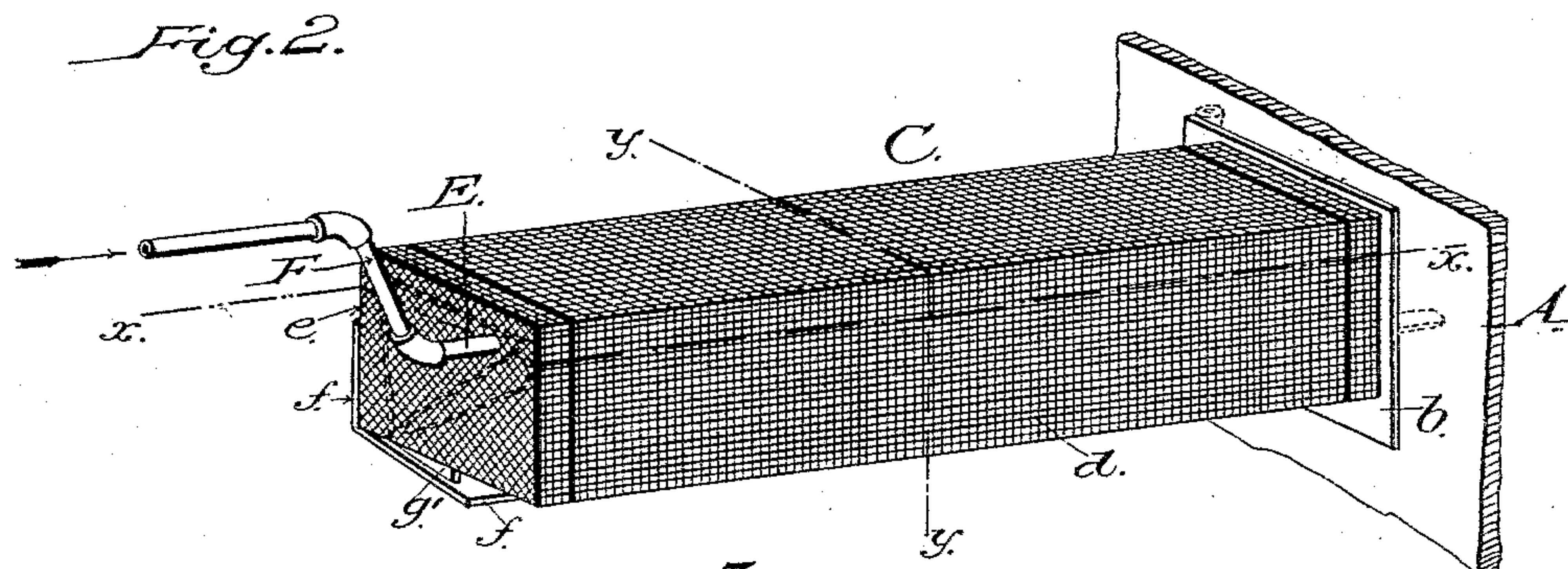
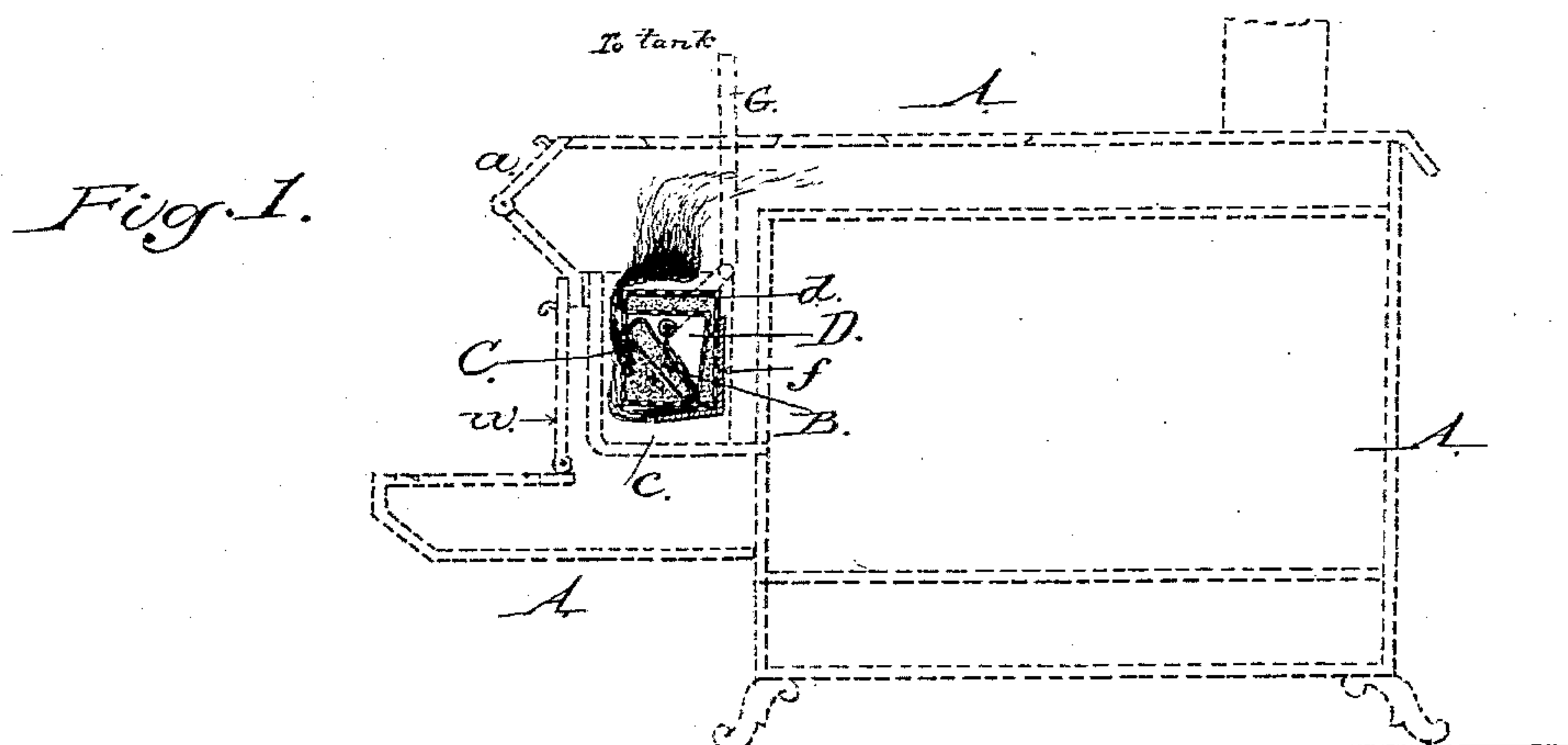
(No Model.)

J. T. RADER.

DEVICE FOR BURNING CRUDE PETROLEUM AND OTHER OILS.

No. 387,811.

Patented Aug. 14, 1888.



WITNESSES.

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DEVICE FOR BURNING CRUDE PETROLEUM AND OTHER OILS.

SPECIFICATION forming part of Letters Patent No. 387,811, dated August 14, 1888.

Application filed February 4, 1888. Serial No. 263,033. (No model.)

To all whom it may concern:

Be it known that I, JACOB T. RADER, a citizen of the United States, residing at Clyde, in the county of Sandusky and State of Ohio, have
5 invented certain new and useful Improvements in Devices for Burning Crude Petroleum and other Oils, of which the following is a full and clear description, reference being had to the accompanying drawings, forming part of this
10 specification, in which—

Figure 1 represents in cross-section my improvement as applied to a cooking stove or range. Fig. 2 illustrates a perspective view of the improvement detached. Fig. 3 is a horizontal sectional view on the line *x x* of Fig. 2, showing the perforated and adjustable discharge-pipe. Fig. 4 is an enlarged cross-sectional view on the line *y y* of Fig. 2.

This invention relates to devices applied to
20 stoves or furnaces for heating purposes; and it consists in the construction and combination of devices, which I shall hereinafter fully describe and claim.

The essential object of my invention is to
25 devise a simple means for burning petroleum or other oils in their crude and refined condition and without necessitating the heating of the same before ignition, and also to so construct my burner that the offensive and objectionable smell and residuum resulting from
30 the burning of such oils are avoided.

In order that others skilled in the art to which my invention appertains may make and use the same, I will now describe its construction
35 and indicate the manner in which the same is carried out.

In the said drawings, A indicates any well-known form of heating or cooking stove, range, or furnace having a feed-door, *a*, side door, *b*,
40 and fire-pot *c*. The external casing, *d*, of the burner C has preferably a square or rectangular cross-sectional configuration, and is of such length or shape as to snugly fit the fire-pot or space usually occupied by the grate. This
45 outer casing is made of any perforated material, but preferably wire-gauze, and its rear wall, *e*, is bolted or otherwise secured to a sheet-metal drip-plate, *f*, the free end of which extends under the bottom portion or wall of
50 the casing *d*, being separated therefrom by suitable lugs or strips, *g'*, thereby leaving between said bottom wall and drip-plate a space,

the purpose of which I shall hereinafter fully set forth.

Within the outer casing, *d*, is placed a removable diaphragm, B, of wire-gauze or other
55 perforated material, said diaphragm having spaced walls, between which a packing of mineral wool is placed, as shown. This diaphragm B is placed within the casing *d* at an angle,
60 and in conjunction with an angular plate, C', of like material, forms an internal chamber D, into which the oil is discharged. The plate C' has a horizontal section parallel with
65 but separated from the top wall of the casing, thereby forming a space, *g*, and a section, *h*, standing at nearly right angles thereto, but inclined to the rear wall of the casing, so as
to form the space *l*, the spaces *g* and *l* and the space beneath the inclined removable dia-
70 phragm being packed with mineral wool, for a purpose hereinafter explained.

The pipe G, which leads from a tank or other source of supply, passes through the
75 stove-casing opposite to the side door, *b*, and is connected by an inclined elbow-joint or coupling, F, with a pipe, E, which enters the internal chamber, D. This latter pipe is perforated with a series of small holes, *m*, spirally
80 arranged throughout its length, and is connected with the coupling F, so that it may have a movement up and down at right angles thereto and in a line approximating the angle
at which the removable diaphragm is placed. The pipe E lies in the upper part of the
85 chamber D and upon or slightly above the portion of the removable diaphragm upon which the crude material is discharged.

The purpose of inclining the diaphragm is that when the oil is discharged thereon at or
90 near its upper end the thin volatile oil passes through the perforate walls and packing of the diaphragm, while the heavier oil is permitted to flow down the diaphragm and pass through the lower wall of the outer casing onto
95 the underlying imperforate drip-plate *f*, upon which it settles in a thick gummy mass. It is in this condition that the device is ready to be lighted, and this is readily done by opening
the front door, *w*, of the stove or furnace and
100 passing a lighted match or taper into the space between the lower wall of the outer casing and the drip-plate *f*. The flame of the match or taper instantly fires the thick oil upon the drip-

plate *f*, and the flame therefrom, passing forward, comes in contact with saturated packing in the chamber beneath the diaphragm. The action of the heat upon this packing quickly converts the volatile oil therein into vapor, which, escaping through the perforate front wall of the casing, meets the flame arising from the burning heavy oil, and thereby adds greatly to the intensity of the heat. The flame from the combined volatile and heavy oil passes upward and burns with a steady white light over the top of the outer casing, said flame being kept from heating the discharge-pipe by the interposed packing of mineral wool, thus preventing the discharge-apertures in said pipe from being clogged. The heavy thick oil or substance which passes down the diaphragm on its way to the underlying imperforate drip-plate *f* has a tendency to settle or clog at the lower portion of the diaphragm; and to relieve said diaphragm of this obstruction I arrange it so that it may be drawn endwise out of the casing, turned end for end, and again placed or slipped within the casing, so that the lower end, which contained the "settlings," will be at the top, contiguous to the discharge-pipe. The oil discharging from said pipe upon the thick gummy mass softens it and causes it to again flow down the diaphragm to the point of discharge.

In view of the above it is evident I am enabled at all times to clear the diaphragm of any matter which would interfere with the successful passage of the light volatile oil which separates from the thicker oil and passes through the diaphragm upon being discharged upon the latter.

The pipe *E*, which discharges the oil upon the diaphragm, is, as before stated, adjustable with relation to the inclination of the latter, so that when its free end is depressed or elevated the discharge of oil will be greater at that end of the diaphragm toward which the pipe is downwardly inclined. This essential feature is necessary, because of the different modes of locating the draft appliances of the several stoves or furnaces to which my improvement may be applied.

In the practical operation of my invention I have ascertained that mineral wool is the best substance to use as a packing for the diaphragm and the spaces or chambers surrounding it. This is mainly because of its porous nature, whereby a rapid and effectual separation of the oils is obtained and its indestructibility. Other substances—such as asbestos—may be employed, but are objectionable because they do not effect that rapid separation of the lighter from the heavier oil, and, further, because of the tendency of the heavy gummy oil to clog the meshes of the material composing the diaphragm.

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

1. A device for burning crude oils, consist-

ing, essentially, of an outer casing of reticulated material, an oil-supply pipe located in the upper portion thereof, and a removable and reversible partition-wall or separator placed at an angle therein and forming an oil-vaporizing chamber in the outer casing beneath said partition-wall or separator, substantially as and for the purpose described.

2. In a device for burning oils, an outer casing of reticulated material, an oil-supply pipe at the upper portion thereof, and a removably-secured partition-wall or diaphragm placed at an angle within said casing, in combination with a drip-plate beneath the casing adapted to receive the heavier oil from the inclined diaphragm, and a packing in the outer casing beneath said diaphragm for receiving the lighter oil passing through the diaphragm, substantially as described.

3. In a device for burning oil, an outer casing of reticulated material and a foraminous diaphragm arranged at an angle therein, in combination with a drip-plate beneath the casing for receiving the heavier oil, and a packing in the outer casing beneath the diaphragm for receiving the lighter oils, substantially as herein described.

4. In a device for burning crude oils, an outer casing of foraminous material, in combination with an inclined foraminous diaphragm placed at an angle within said casing and having a packing of mineral wool between its sides, and a discharge-pipe communicating with the source of supply and discharging upon said diaphragm, whereby a separation of the lighter and heavier oils is effected.

5. The combination of an exterior casing of foraminous material, an internal diaphragm of like material removably placed at an angle therein, a non-conducting packing between said diaphragm and the walls of the exterior casing, and an imperforate drip-plate beneath the lower wall of said casing receiving the oil which passes through said wall, and a pipe or tube discharging the crude oil upon the diaphragm, substantially as described.

6. A device for burning oils, consisting of an exterior casing of foraminous material, an interior removable diaphragm of like material having spaced walls, between which is placed a packing of mineral wool, an angular plate, *C'*, between the diaphragm and casing, and a packing between said plate and diaphragm and walls of the casing, a pipe or tube discharging the oil upon the diaphragm, and an imperforate drip-plate beneath the outer casing upon which the heavier oil is discharged and burned, substantially as described.

7. The combination, with an outer casing of foraminous material having a non-heat-conducting packing at its sides and ends, of a removably-secured diaphragm of foraminous material placed at an angle within the outer casing and a pipe discharging the oil thereon, said diaphragm having perforate walls, between which a packing of mineral wool is

placed, whereby a separation of the lighter from the heavier oils is effected, and an imperforate drip-plate beneath the lower wall of the casing upon which the heavier oil is discharged and burned.

5 S. An exterior casing and a removably-secured inclined diaphragm, said casing and diaphragm being formed of foraminous material, in combination with a pipe communicating with the source of supply, a fixed coup-

ling, and a perforated discharge-pipe loosely connected therewith and extending over the diaphragm, whereby said pipe may be adjusted at an angle approximating the inclination of the diaphragm.

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Witnesses:

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