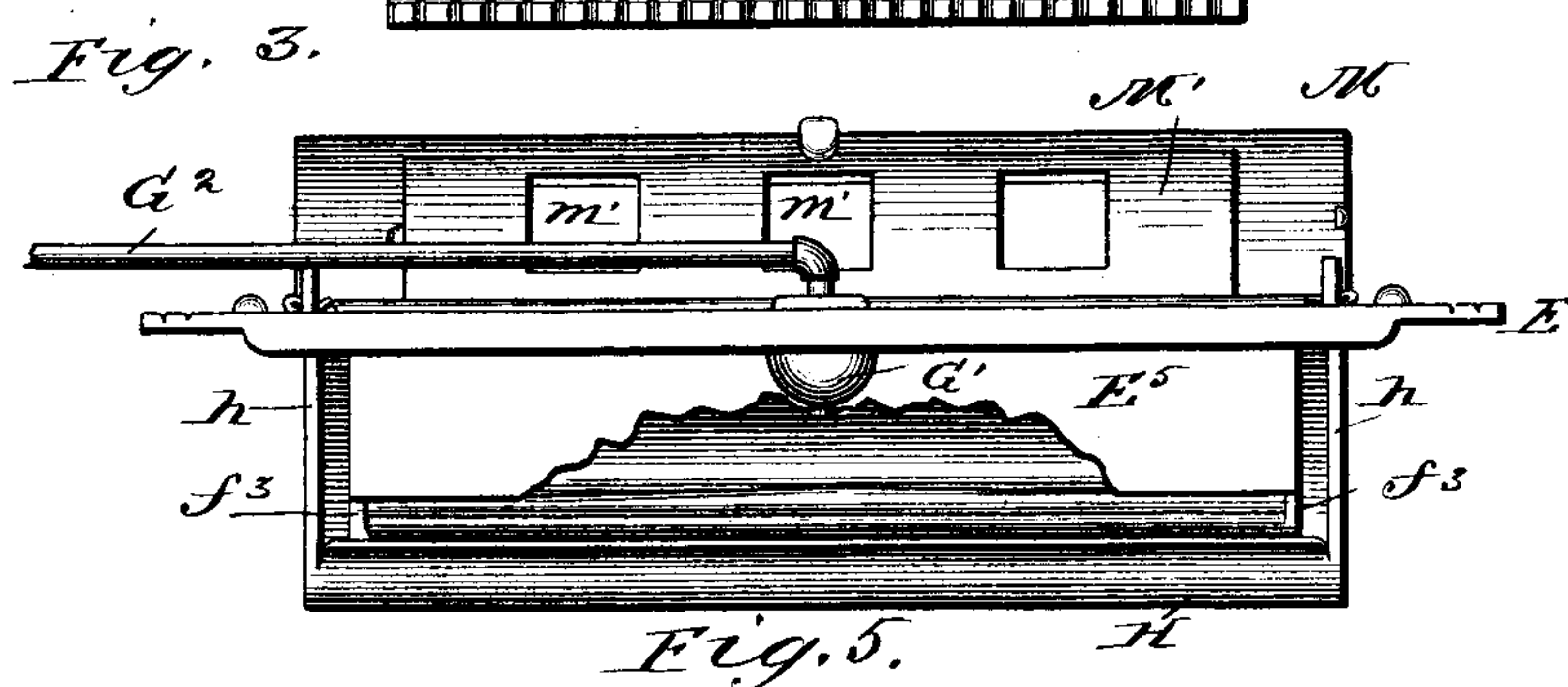
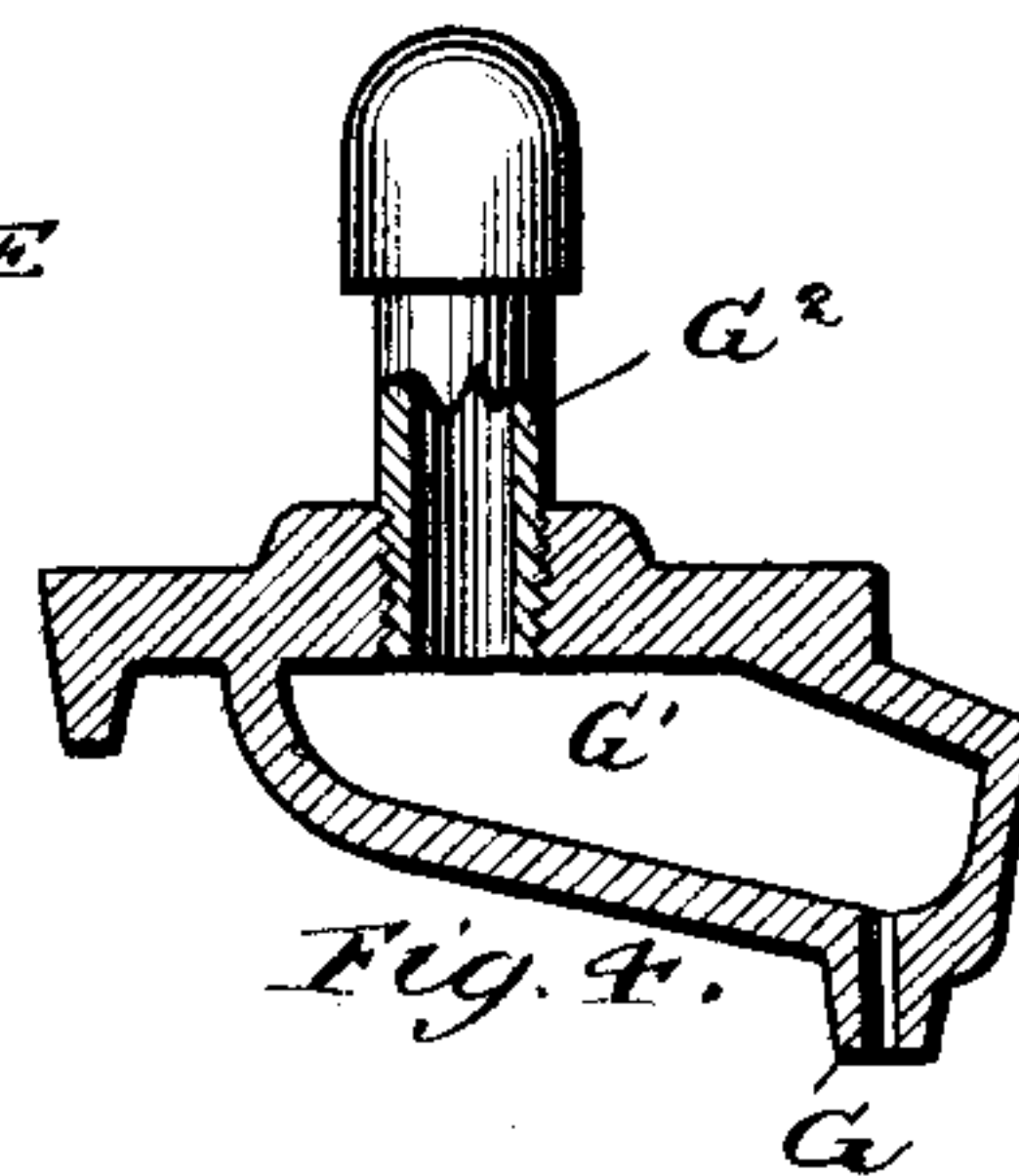
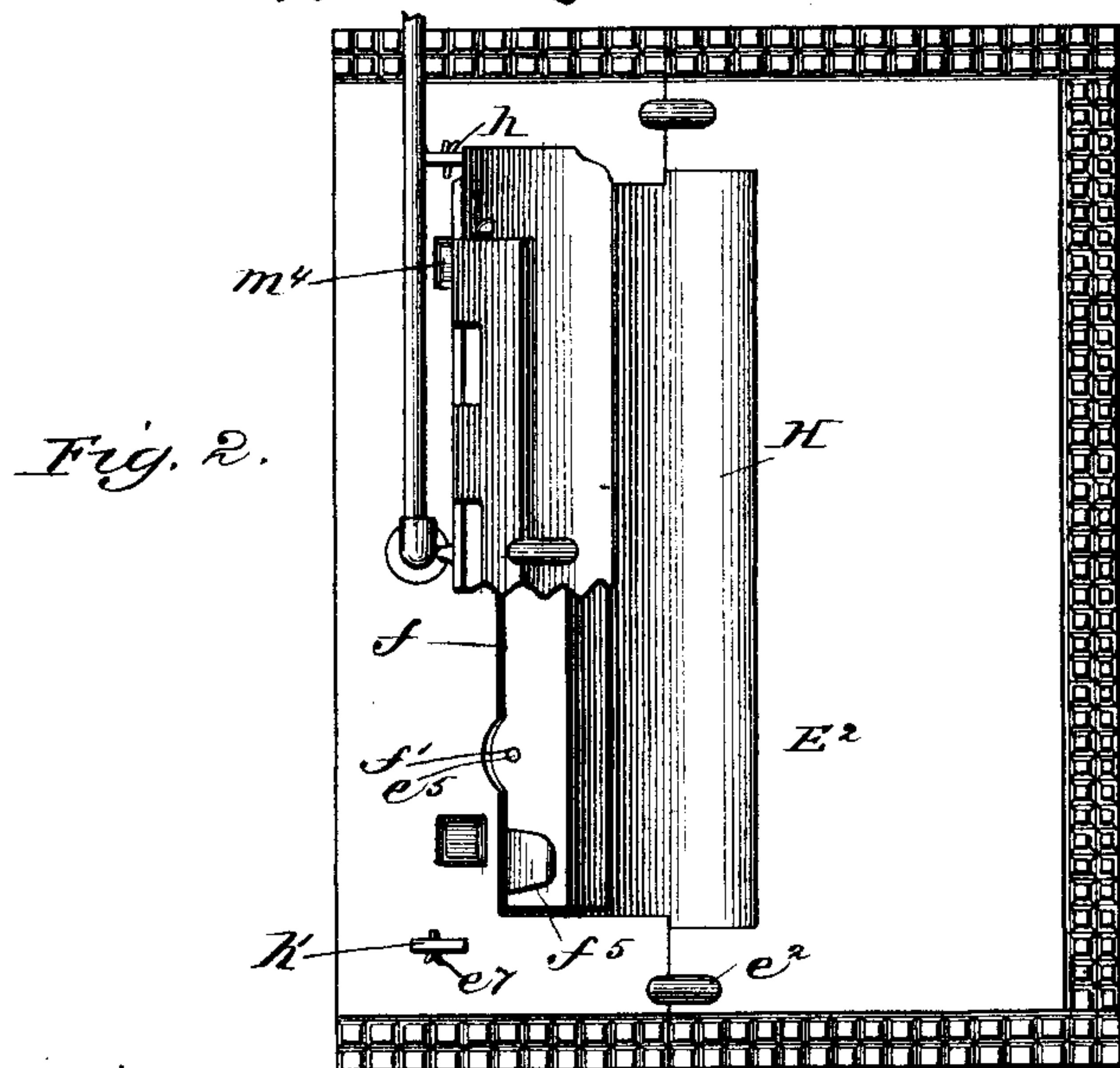
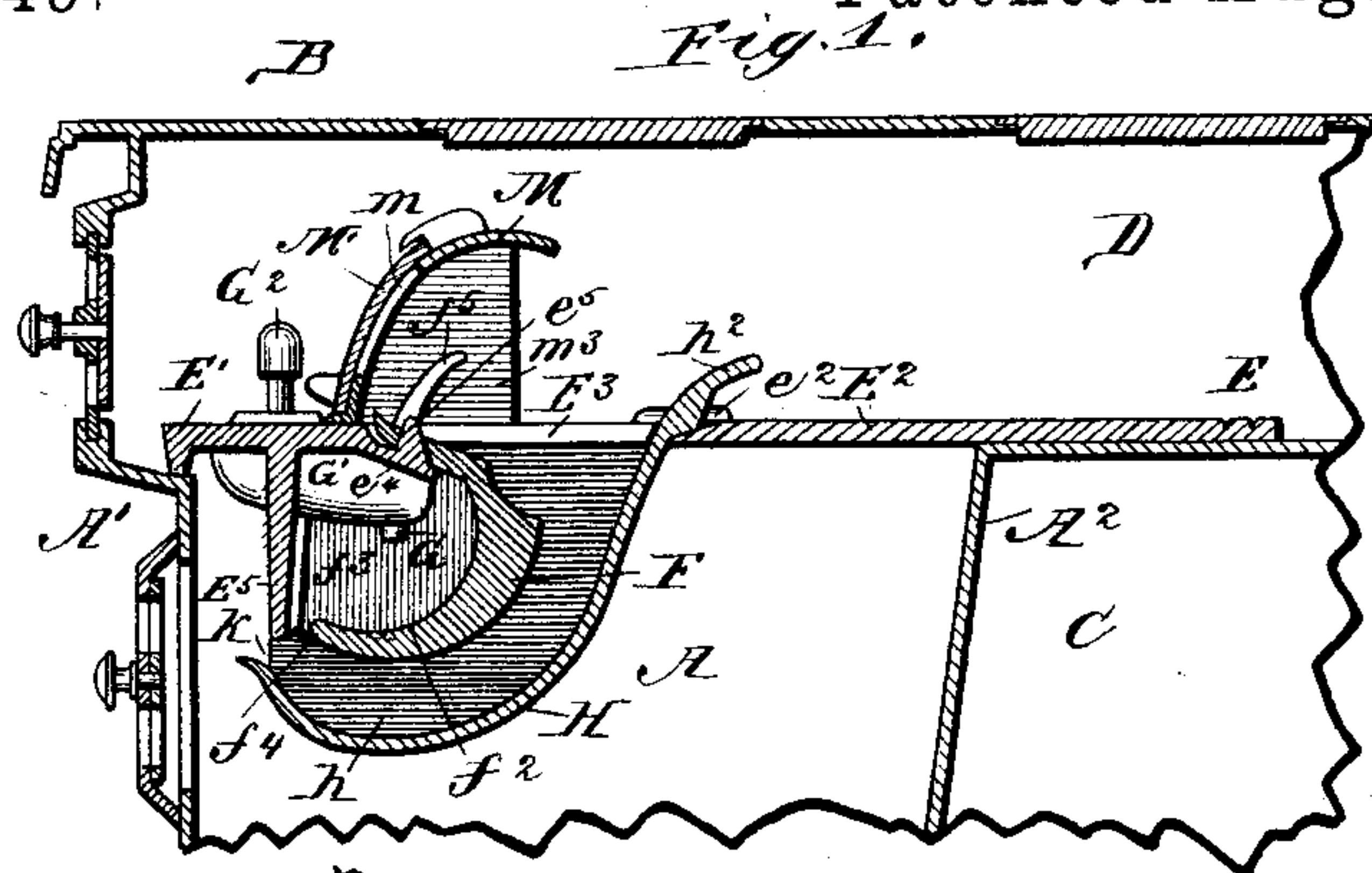


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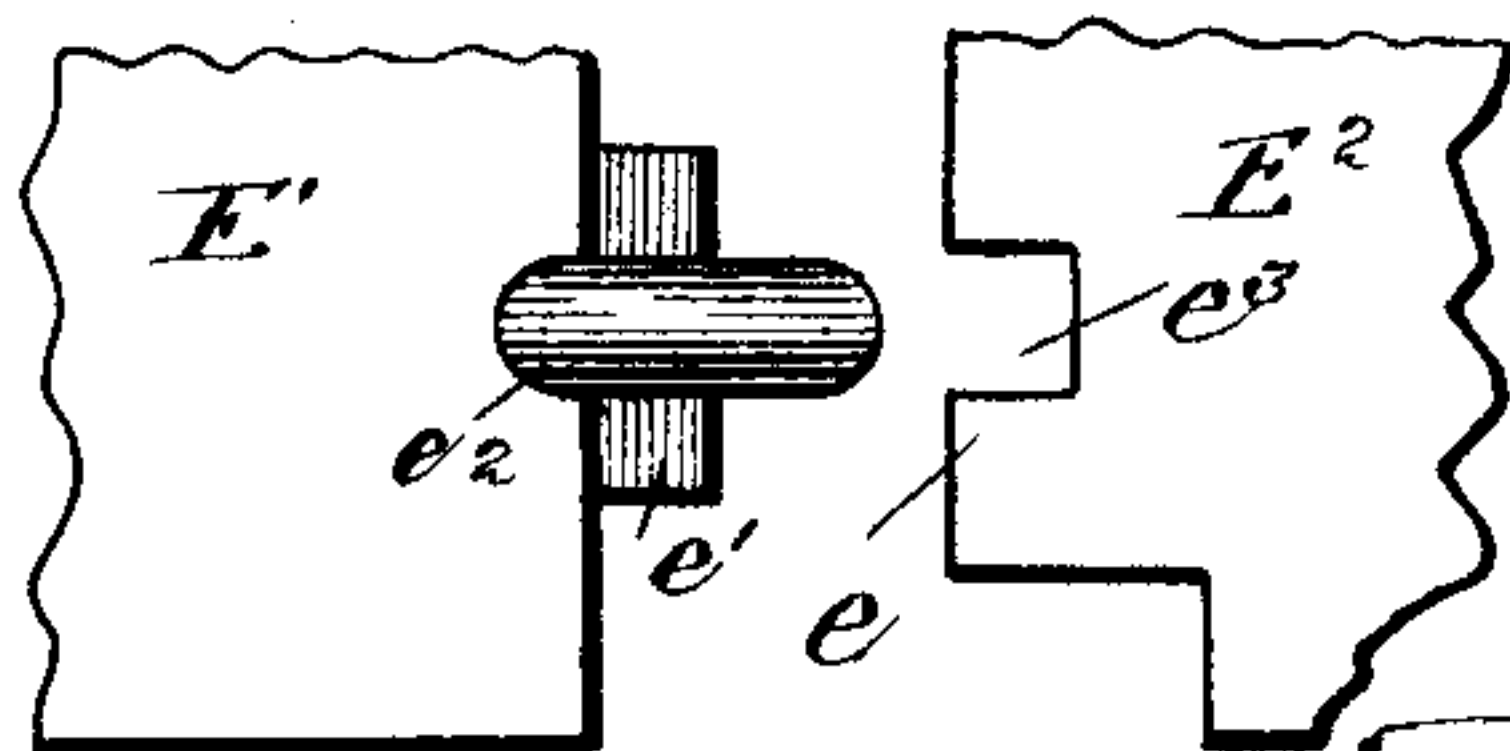
C. J. EDMONDS.
LIQUID FUEL BURNER.

No. 388,649.

Patented Aug. 28, 1888.



Witnesses,
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UNITED STATES PATENT OFFICE.

CHARLES J. EDMONDS, OF GRAND CROSSING, ILLINOIS.

LIQUID-FUEL BURNER.

SPECIFICATION forming part of Letters Patent No. 388,649, dated August 28, 1888.

Application filed February 17, 1887. Serial No. 227,917. (No model.)

To all whom it may concern:

Be it known that I, CHARLES J. EDMONDS, a citizen of the United States, residing at Grand Crossing, in the State of Illinois, have invented certain new and useful Improvements in Liquid-Fuel Burners, of which I do declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My present invention has relation to that class of liquid-fuel burners designed for use in connection with stoves or furnaces, in which the fuel, usually a heavy hydrocarbon oil, received through a suitable induction-pipe, is distributed upon a bar, commonly termed in practice a "burner-bar," in such manner as to produce abroad sheet of flame, which serves to give a requisite heat; and particularly does my invention relate to that class of burners which are designed to be set into the fire-boxes of ordinary stoves or furnaces originally designed for burning hard fuel.

The object of my present invention is to provide an improved construction of burner-bar; to provide an improved deflecting-plate for use in connection with such bar; to provide improved means for sustaining said bar and deflecting-plate within the fire-box of the stove or furnace, and in general to furnish a more effective form of liquid-fuel burner than any with which I am familiar.

To this end my invention consists in the novel features of construction hereinafter described, illustrated in the accompanying drawings, and particularly defined in the claims at the end of this specification.

Figure 1 is a view in central vertical section through my improved burner, showing the same in position within a fire-box of a stove. Fig. 2 is a plan view of the burner detached, parts being broken away. Fig. 3 is a front view of the burner detached. Fig. 4 is an enlarged detail view, in vertical section, through the oil-reservoir. Fig. 5 is an enlarged detail plan view of the joint between the sections of the top plate.

My invention is shown in the accompanying drawings as applied to an ordinary cooking stove or range, although it will be readily understood that it is applicable for use in various other forms of stoves or furnaces.

A designates the fire-box of the stove, of

which A' and A² denote, respectively, the front and bridge walls, and B and C indicate, respectively, the top of the stove or range and its oven, between which is the usual chamber D, for the passage of the products of combustion. Above the fire-box A, and completely covering the same, is what I designate the "top" or "supporting" plate, E, which rests upon the bridge-wall and front wall of the fire-box, this plate being preferably formed of the front section, E', and rear section, E², these sections being removably connected together by means of the lugs e of the plate E', which rest upon the lug e' of the plate E², and are held in position thereon by means of the projecting lugs e², which enter the slots e³ and sufficiently overlap the edges of the plate E² to firmly hold the sections of the plate against downward sagging.

It will be observed that near the outer edges of the two sections of the top or supporting plate, E, a series of grooves or corrugations are formed at short distances apart, the purpose of these corrugations being to enable the plate to be readily broken upon the lines of these corrugations, in order to permit such plate to be readily fitted into any of the ordinary sizes of stoves or ranges; and it will be readily seen that by reason of these corrugations the top or supporting plate, E, can be very conveniently fitted to different sizes of stoves, it being only necessary to break off with a chisel the superfluous parts of the plate. The top plate, E, is provided with the opening E³, extending across the same, the greater part of this opening being formed within the section E' of the plate, and the purpose of this opening being to permit the burner-bar F to be set in position beneath the plate, and to permit the products of combustion to pass over such burner-bar and through and over the top of the plate.

It will be seen that the section E' of the top plate is provided with the ledge e⁴ and studs or pins e⁵ at the edge of the opening E³, the purpose of this ledge and these studs or pins being to form a suitable support for the burner-bar, the upper portion of which is provided with the ledge f to rest upon the ledge e⁴, and with eyes f' to engage with the studs or pins e⁵ of the top plate. The burner-bar F is provided throughout its length with a recess, f²,

the ends of which are closed by the plates f^3 of the bar; and it will be observed that these plates f^3 project some distance in front of the bar, so that the front edges bear against the front plate, E^5 , which depends from the under side of the section E' of the top plate. It will be seen that when the burner-bar F is in position for use, as shown in Fig. 1, the end plates of such burner bearing against the depending front plate, E^5 , a space will be formed between this front plate and what I term the "distributing-edge" f^1 of the burner-bar. This edge f^1 is preferably a trifle higher than the bottom of the recess f^2 of the burner-bar, and therefore serves to retain within such recess a small quantity of liquid fuel and to distribute the same from end to end of the recess; and to facilitate this distribution of the fuel the bottom of the recess f^2 is a trifle higher at its center than at its ends, so that being delivered at the central point it shall flow uniformly toward the ends before passing over the edge f^1 of the recess. The liquid fuel is delivered to the burner-bar through the inlet pipe or opening G , which receives its supply from the chamber G' , preferably cast on the under side of the section E' of the top plate, and a pipe, G^2 , leads from this chamber G' to the main source of fuel supply. My purpose in thus providing a chamber, G' , is to avoid the necessity of extending the pipe G into such position with respect to the burner-bar that it will become heated, since I have found by practice that when the delivery-pipe becomes heated to a considerable extent there is danger of the pipe becoming clogged.

It will be readily seen that by the arrangement shown the discharge pipe or opening G can be easily cleaned, in case it should become in any wise clogged, by simply inserting a small wire through the opening thereof. Suitable lugs or ears, f^5 , are formed at the top of the burner-bar, in order to permit this bar to be lifted through the top plate when for any reason this may become necessary, either for the purpose of cleaning the bar or replacing it when worn; but as the burner-bar is free to swing backward to a limited extent, by reason of its peculiar connection with the top plate, the preferred method of cleaning this bar is by inserting a crooked wire or poker below the depending plate E^5 and pushing backward the burner-bar, so that the wire or poker can be moved lengthwise to scrape the deposit from the bar.

Beneath the top plate, E , and preferably sustained by said plate, is placed what I designate the "deflecting-plate" H , this plate being provided with the end walls, h , the upper arms, h' , of which pass through the slots e^6 in the top plate, and are held therein by means of pins e^7 . This deflecting-plate H is preferably of curvilinear outline, its lower front edge being held at a point in front of the burner-bar and just beneath the edge of the depending plate E^5 , and its main body passing beneath the burner-bar and back of the same and

terminating at a point about or above the line of the top of such bar. The back h^2 of this deflecting-plate H preferably extends through the opening E^3 of the top plate and rests upon and is sustained by the top plate.

It will be seen from the construction of parts as thus far defined that when my improved burner has been placed within the stove the top plate, E , completely covers the fire-box, so that only the products of combustion from the burner can pass through the top plate to the combustion-chamber D in the top of the stove. As the liquid fuel is fed from the source of supply through the delivery-pipe G and to the burner-bar, it is distributed from end to end of the recesses of such bar and passes in a thin film over the distributing-edge of the bar, at which point it will be ignited. As air is admitted from end to end of the burner through the space or opening k between the lower edge of the front plate, E^5 , and the deflecting-plate H , the volume of air so admitted, uniting with the hydrocarbon gas, will pass in a broad sheet of flame around the bottom of the burner-bar in the space between such bar and the deflecting-plate H . The purpose of this deflecting-plate is to form, with the burner-bar, this combustion-chamber, through which the products of combustion will pass, and I have found in practice that by the use of this deflecting-plate, forming, as it does, a circumscribed combustion-chamber for the initial burning of the fuel, the burner-bar will be heated to such a high degree as to prevent the formation thereon of soot or charcoal that might otherwise clog the burner-bar and impair its operation. I have found that the parts of the hydrocarbon not converted into gas will not lodge upon the intensely-heated burner-bar, but will be either consumed or carried off by the strong draft in the contracted space between the burner-bar and the deflecting-plate. As the sheet of flame passes through the opening E^3 in the top plate, E , the products of combustion are allowed to freely expand in the upper part of the stove, where their complete combustion will occur.

It will be readily seen that the amount of air admitted to the burner can be controlled by the usual slide-valves, L , in the front of the stove, or in other suitable ways. After the burner-bar has become highly heated by the burning oil distributed over its edge, it will be found that the oil thereafter delivered into the channel of the burner-bar will be more or less vaporized before passing in a thin sheet over the edge of such bar.

Although features of my present invention are susceptible of use in connection with a stove or furnace in other ways, I prefer the employment of a supporting-plate or top plate in the manner shown, particularly where the invention is to be applied in connection with stoves or ranges for culinary purposes, for the reason that by this arrangement the burner can be very conveniently placed in position within the ordinary stove, and can be readily

removed therefrom in case it should be desired to use the stove for burning other than liquid fuel. So, also, the precise details of construction of the various parts may be modified without departing from the spirit of my invention.

In order to better adapt my improved burner for use in connection with cooking stoves or ranges, where it is sometimes desired to direct the greatest heat against the top of the oven, and at other times against the top surface of the stove, I have provided a register-plate, M, having openings *m* therein closed by the valve-plate M', provided with the openings *m'*, adapted to be brought more or less coincident with the openings in the plate M. The plate M is provided with the end walls, *m*³, and also with the feet adapted to enter suitable sockets, *m*⁴, formed for the purpose in the top plate, E. It will be seen that when this plate is in position upon the top plate and the valve in its face is closed the products of combustion will be thrown upward by the deflecting-plate H, and will impinge against the upper surface of the stove-top. If now, however, the register-valve in the plate M be opened by bringing coincident the openings *m* and *m'*, a volume of cold air will be admitted through these openings, which volume of air will strike the sheet of flame thrown upward by the plate H, and will deflect this flame downward against the top of the oven, so that the greater part of the resultant heat from the products of combustion will be communicated to the oven.

It will be readily understood that the details of construction above defined may be varied without departing from the scope of my invention, and to such details therefor I do not wish my invention to be understood as restricted.

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

1. The combination, with the fire-box of a stove or furnace and a suitable delivery-pipe for liquid fuel, of a liquid-fuel burner comprising a top plate extending over the fire-box and provided with an opening for the escape of the products of combustion, and a burner-bar immediately beneath said top plate, said bar having a recess formed lengthwise thereof, and being closed except for a space adjacent its lower front edge, substantially as described.

2. In a liquid-fuel burner, the combination, with a suitable delivery-pipe, of a burner-bar having a recess formed lengthwise thereof in its lower front portion, and a depending front plate adapted to close the front of the burner-bar, substantially as described.

3. The combination, with the fire box of a stove or furnace, and with a suitable delivery-pipe, of a liquid-fuel burner comprising a top plate extending over and completely closing the fire-box and provided with an opening for the products of combustion, a burner-bar suspended beneath said top plate and com-

pletely within the fire-box, and provided along its lower portion with an overflow-edge adapted to receive and distribute the liquid fuel, and a deflecting-plate extending from a point near the lower portion of the burner-bar to the opening of the top plate, substantially as described.

4. In a liquid-fuel burner, the combination, with the burner-bar having a shallow channel extending lengthwise thereof and having an overflow-edge at its lower front portion, of a deflecting-plate extending from the lower front portion of said burner-bar to the upper back part thereof and in proximity thereto, so as to form a combustion-chamber between said bar and plate, substantially as described.

5. In a liquid-fuel burner, the combination, with a fuel-delivery pipe, of a burner-bar having its lower front portion provided with a shallow channel and an overflow-edge lengthwise thereof, a front plate adapted to close the front of the burner-bar, and a deflecting-plate extending from beneath and in front of said burner-bar to a point behind the same and separated a slight distance therefrom, substantially as described.

6. In a liquid-fuel burner, the combination, with the fuel-delivery pipe, of a recessed burner-bar having its lower front portion provided with a slightly-upturned overflow-edge, and having its main body extending upwardly, and a supporting-plate, upon which said burner-bar is removably hung, substantially as described.

7. In a liquid-fuel burner, the combination, with a suitable supporting-plate adapted to cover the fire-box of the stove, of a recessed burner-bar provided at its lower front portion with an overflow-edge, a dependent front plate for closing the front of the burner-bar, and a deflecting-plate, said several parts being carried by the supporting-plate, substantially as described.

8. In a liquid-fuel burner, the combination, with the supporting-plate adapted to cover the top of the fire-box and provided with a central recess, of a burner-bar arranged to be slipped through said recess and detachably sustained by the supporting-plate, substantially as described.

9. The combination, with the fire-box of a stove or furnace and a liquid-fuel burner comprising a burner-bar adapted to fit completely within the fire-box, of a supporting-plate for sustaining said burner-bar, said plate being adapted to cover the fire-box and being formed of separate sections suitably connected together, whereby the burner and the top plate can be readily inserted into and removed from the stove or furnace, substantially as described.

10. In a liquid-fuel burner, the combination of a suitable supporting-plate provided with a depending front plate or wall, a recessed burner-bar having an upturned distributing-edge in proximity to said depending front wall or plate, and a deflecting-plate extending from in front of the lower portion of the burner-

bar to a point behind the top thereof, said deflecting-plate being provided with end walls extending to the supporting-plate, substantially as described.

5 11. In a liquid-fuel burner, the combination, with a burner-bar and a suitable plate for sustaining said bar and adapted to cover the fire-box of the stove, of an upper top plate provided with a register-valve, substantially as
10 described.

12. In a liquid-fuel burner, the combination, with a burner-bar, of a top plate provided with an expanded liquid-fuel chamber, G, and suitable delivery and discharge pipes leading into and from said chamber, substantially as
15 described.

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