

No. 630,751.

Patented Aug. 8, 1899.

D. SIMMONS.
HYDROCARBON BURNING APPARATUS.

(Application filed Nov. 7, 1898.)

(No Model.)
Fig. 1.

2 Sheets—Sheet 1.

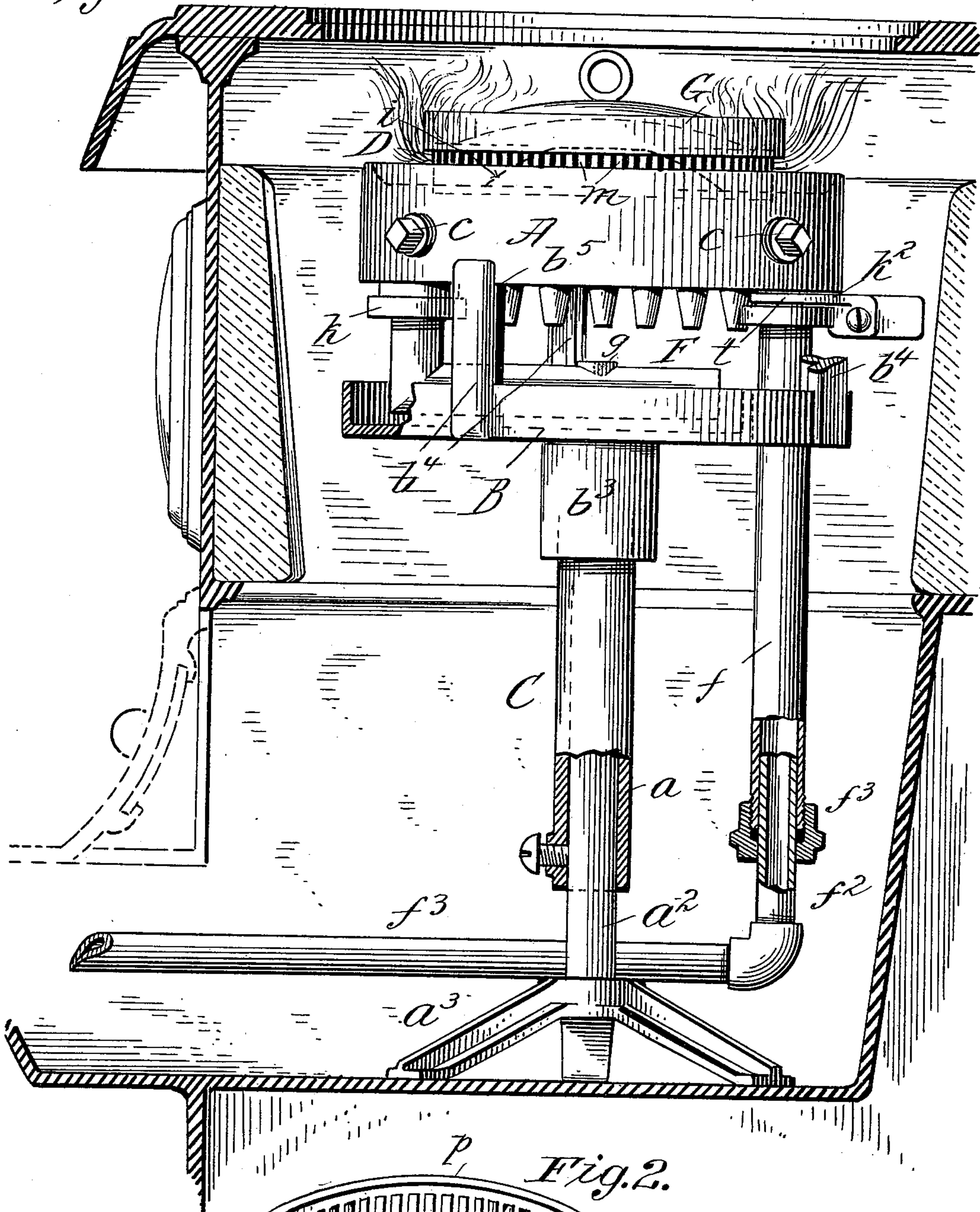
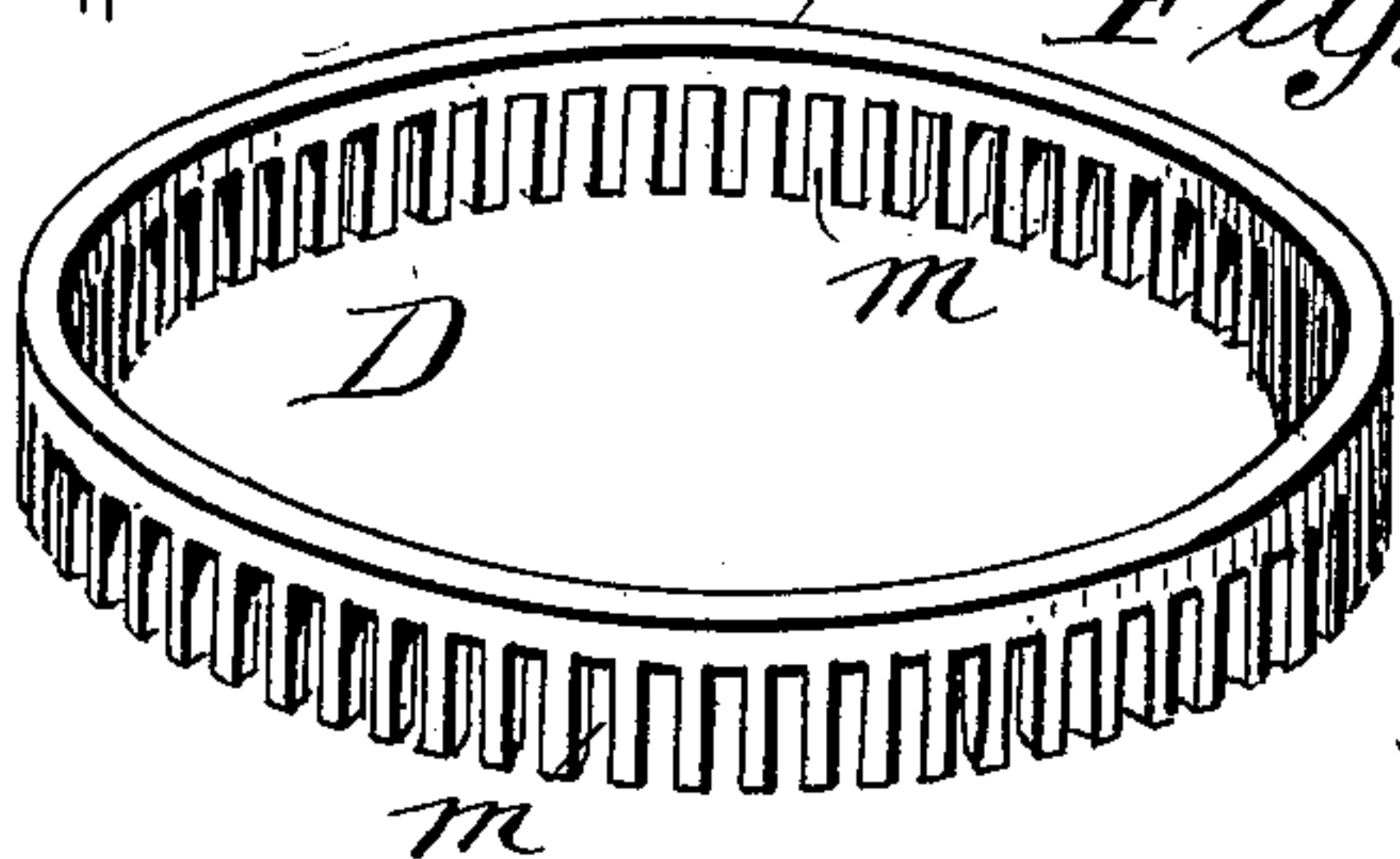


Fig. 2.



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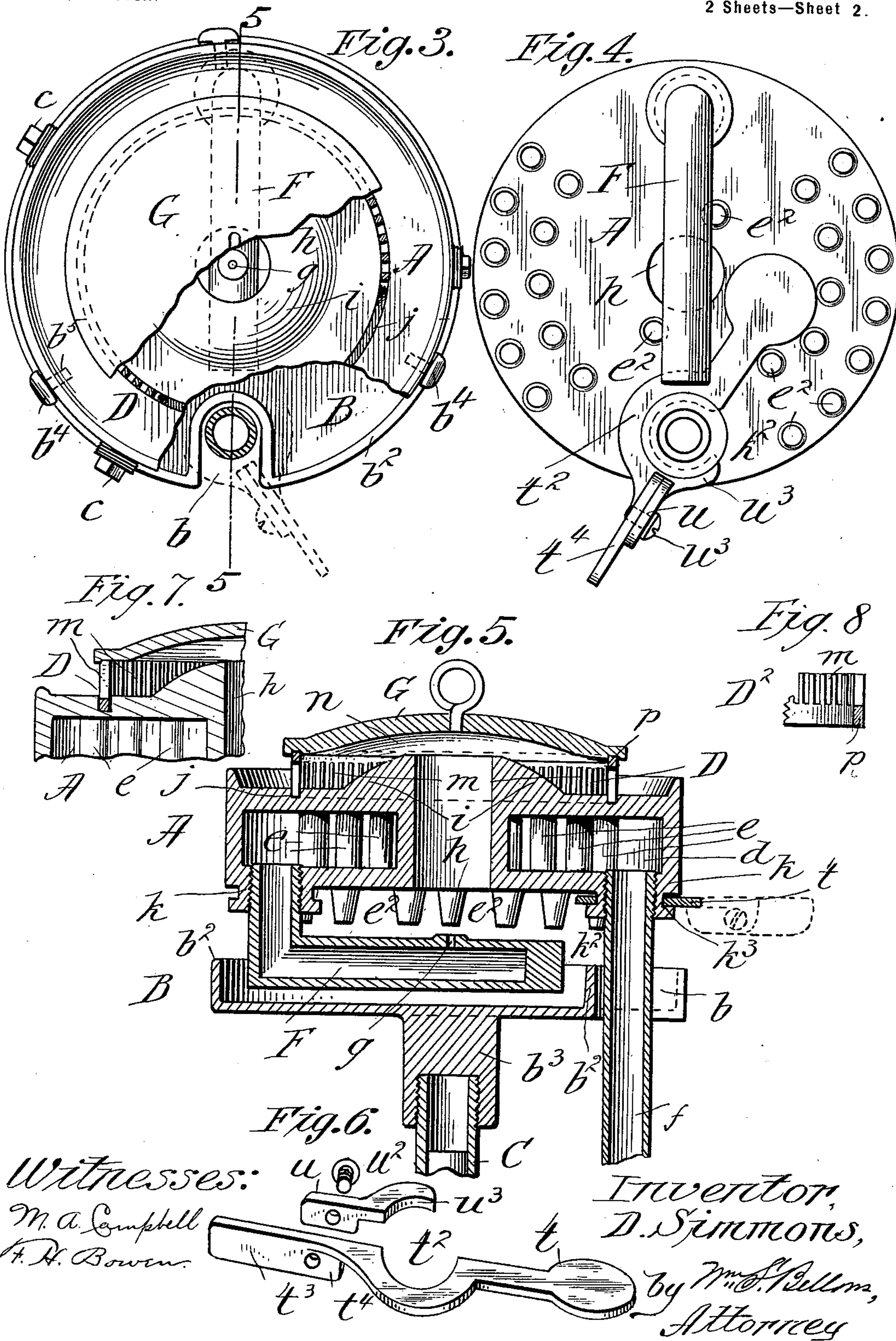
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2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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HYDROCARBON-BURNING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 630,751, dated August 8, 1899.

Application filed November 7, 1898. Serial No. 695,673. (No model.)

To all whom it may concern:

Be it known that I, DANIEL SIMMONS, a citizen of the United States, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Hydrocarbon-Burning Apparatus, of which the following is a specification.

This invention relates to certain new and useful improvements in burners, more especially designed for heating purposes, for vaporizing and burning hydrocarbon, the same being especially desirable and available for use in a kitchen and elsewhere where the burner is to be used for providing cooking and baking heat.

The objects of the invention are to supply a vaporizing and burning apparatus for hydrocarbon which is entirely practical, efficient, and economical, assuring in its use the development for availability of the maximum effective heat products from the combustion; to provide a construction of burner which is simple, cheap, and easy of production and, moreover, one which, made of separately-constructed parts, is readily assembled for cooperation and as easily unassembled for the purposes of transportation or storage and for cleaning such of the parts as may require it after protracted use in burning; to provide constructions whereby the burner and its supports and oil-supplying connections are adjustable more especially for the purpose of adapting these parts to be applied for use in ordinary cook-stoves of varying sizes and having varying depths between the top covers and the base of the ash-pit; to provide means whereby the flame-exits arranged in a circular series at the upper portion of the burner may be always kept free and clear, so that they may by an inversion or substitution of a part be varied as to the individual size or area of each, the means to this end also being a provision to the avoidance of breakage or injury to the same in careless handling in removal or replacement of the cap at the top of the burner, and to generally improve and render more satisfactory the burner of the class to which this invention relates than have been

burners of the same general class as heretofore constructed; and the invention consists in constructions and combinations of the parts, all substantially as will hereinafter fully appear, and be set forth in the claims.

The improvements are illustrated in the accompanying drawings, in which the burner is shown, in Figure 1, in side elevation, with portions broken out and in section for clearer illustration, the burner being shown as located in the fire-box as supported from a stand setting in the base of the ash-pit, the grate being removed. Fig. 2 is a perspective view of the removable kerfed ring, to be hereinafter more particularly referred to. Fig. 3 is a plan view of the burner, with parts thereof broken away to disclose underlying parts for increased clearness of illustration. Fig. 4 is a plan view of the burner inverted. Fig. 5 is a central vertical section through the burner and through the pan by and above which the burner is supported. Fig. 6 is a perspective in illustration of the parts which constitute a flame-check or shut-off device which is temporarily closed preparatory to starting up the burner. Figs. 7 and 8 are views of parts in detail to be hereinafter referred to.

Similar characters of reference indicate corresponding parts in all of the views.

I will now proceed to describe the parts in detail in connection with the drawings.

A represents the retort, removably supported above and by the pan B, which latter is mounted on the upper end of a post or standard C, consisting of the telescoping members a^1 , a^2 , having the suitable base support or feet a^3 .

The pan B, as seen in Fig. 3, is of circular form excepting that it has one marginal portion formed with a recess b , and the horizontal base thereof is surrounded with the upstanding wall b^2 , which is reentrant at the said recess. The pan is preferably constructed of cast-iron, and it has formed integrally therewith at its bottom the central depending hub b^3 , suitably apertured and tapped to receive the screw connection therewith of the upper member of the telescoping post C, and the said pan, furthermore, has integrally cast

as a part thereof the several upstanding lugs or members b^4 , provided at their upper portions with the rests or shoulders b^5 , all in a horizontal plane and at different portions relative to the margin of the pan for the support of the burner comprising the retort A and for holding said retort against displacement laterally.

The retort, as shown, is in the form of a hollow annular body or casing, advantageously made of cast-iron, the same being suitably cored out to have the quite considerable inclosed annular chamber d , with the integral pillars e at close intervals therewithin, which unite the upper and lower horizontal walls of the retort, the said pillars having the depending extensions e^2 below the base of the retort, said parts e e^2 constituting heat-conductors whereby the retort becomes much more quickly heated.

cc represent screw-plugs which close openings through the outer wall of the retort made in the casting for the purpose of removing the sand core.

It will be observed that the retort has the two depending internally-screw-threaded vertical passages leading through the bosses k k^2 , which are formed on the lower wall of the retort, to one of which is screw-connected the depending pipe-section f , with which the other pipe-section f^2 has telescopic engagement, the stuffing-box f^3 being provided that there shall be an oil-tight fit where the lower section f^2 enters the upper one. It is to be understood that the telescopic oil-feed pipe is by the pipe-section f^3 horizontally disposed and coupled thereto to constitute a supply-conduit for the burner from a supply-tank in which by a maintained air-pressure above the oil—for instance, of about five pounds—the oil will be continuously supplied. This provision for the oil-feed is not new, and hence is not illustrated. To the other depending passage the right-angled pipe F is screw-connected, its horizontal end-closed member ranging centrally across under the central hole h , which is formed upwardly through the retort, said pipe having through its top wall directly under the center of said central hole the minute upwardly-opening oil-exit jet hole or passage g . The aforesaid central hole is surrounded at its upper orifice by the dome-shaped protuberance i , which is integrally cast as a part of the retort, and this protuberance is surrounded by an annular groove j , which is located concentrically about midway between its base and the outer edge of the top of the retort.

D represents a ring, which may be advantageously of brass, the same being provided with the series of regularly-spaced kerfs or slots m , extending from its one edge almost, but not quite, to the opposite edge, as seen in Figs. 2 and 5 more especially. This kerfed ring is removably set in the aforesaid annular groove j , and it is overlaid by the con-

cavo-convex cap G, which, in conjunction with the aforementioned dome-shaped protuberance and by reason of its support, constituted by the ring D, separated from said protuberance, provides a gas-exit passage n outwardly in all directions from the top of the portion i , where the central hole meets the passage n , a series of orifices for the gas or vapor being constituted by the kerfs m in great number all around the burner.

It is to be observed that the ring D may be used in various ways for the purposes of regulating the gas or vapor delivery for combustion. For instance, it may be applied with its unsevered edge p uppermost, as shown in Fig. 5, whereby there is less clear delivery-space through each of the openings than would be the case were the said ring inverted, so as to have its unsevered edge sunk within the annular groove j , as indicated in Fig. 7; and, again, another ring D^2 , like the one D, may be substituted for the latter, said ring D^2 , as shown in Fig. 8, having kerfs of considerably less depth, whereby more contracted delivery-opening may be provided to suit conditions for use in some cases where a lessened delivery area is more advantageous.

It will be perceived that the depending boss k^2 , with which the oil-feed pipe is connected, is annularly grooved, as indicated in Figs. 1, 4, and 5, this groove serving in a simple way to form the bearing-support for the cut-off plate t , which intermediately has the semi-circular yoke t^2 , the internal margin of which engages in the groove, and the handle extension t^3 thereof is provided with the depending lug t^4 , with which engages facewise the lug u , as held thereagainst by the binding-screw u^2 , said lug being provided with the arc-shaped extension u^3 , which also marginally enters within the aforementioned annular groove k^3 and serves to retain the cut-off device against displacement from its engagement with the grooved boss, said device being free to swing horizontally thereon within suitable limits as constituted by the depending projection e^2 , normally occupying a position to leave the central hole upwardly through the retort open, but to temporarily cover and close said hole at its bottom.

A cock or needle-valve is understood as provided at some suitable place in the oil-supply pipe f^3 , as common in vapor-burning apparatuses.

In proceeding to put the burner into use after the same has been set up within the stove or furnace and adjusted to the proper height relative to the top thereof, as indicated in Fig. 1, or suitably otherwise, the oil is permitted to flow through the feed-pipe up into the retort, filling the same and passing in part therefrom through the underturned pipe, overflowing into the pan B until the latter is nearly full, the cut-off device at this time closing the lower end of the hole h . The oil-feed is now temporarily stopped by shutting

off the supply of oil, and the oil in the pan is ignited, heating up the retort and the oil therein and vaporizing the latter, and so soon as the complete vaporization of the oil in the retort has been accomplished the oil-flow through the feed-pipe is again resumed by turning on the flow of oil, and the vapor upwardly issuing through the jet-hole *g*, passing therefrom through the central hole in the retort and thence by way of passage *n*, issuing in a blue flame through the kerf *m* in the ring D, provides a very intense and effective heat passing outwardly and upwardly from under the cap for utilization for culinary and other purposes.

It is to be perceived that the cap G is a separate part from the ring D, the latter being separate and detachable from the retort, while the retort in turn merely rests upon the shouldered lugs or upright supports *b*⁴. It is thus apparent that each of these parts may be readily and separately cleaned on occasion, that these parts may be practicably and most cheaply made, and that because the cap G does not have the apertured ring D constructed as a part thereof when the said cap is lifted or replaced, sometimes hastily and carelessly, by not carrying said portion D as one thereof, and which part D is necessarily by reason of the closeness of the kerfs or apertures of a rather delicate or fragile construction, this said apertured portion of the device will not likely be jammed or broken.

It will be perceived that the provision of the aperture *b* edgewise within the generally circular margin of the pan, which has a continuous circular and reëntrant upstanding lip or wall, permits the feed-pipe section to lead upwardly to connection with the retort within the margin of the pan and yet without penetrating it, which would necessitate greater complication and packing and also would ren-

der the unassemblage of the parts less convenient and easy.

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

1. In a hydrocarbon-burner, the combination with the annular hollow retort having the depending screw-threaded boss *k*² provided with the peripheral groove *k*³ and the angular end-closed pipe F and having the upwardly-opening jet-opening *g*, of the shut-off device consisting of intermediate yoke *t*² adapted to engage in the groove of said boss, and having at one end the aperture-closing portion *t*, and at its other, the member *t*³, together with the separable section *u* having the arc-shaped portion *u*³ to also engage in said groove, and the uniting-screw *u*², substantially as described.

2. In a hydrocarbon-burner, a retort having a central opening and provided with a groove J in its top, combined with the removable slitted ring placed in the groove, and the removable cover placed upon the top of the ring, whereby the parts may be removed and cleaned, substantially as set forth.

3. In a hydrocarbon-burner, the pan B provided with the supports *b*⁴, shaped as shown, and the retort A which is detachably supported upon the supports, the vertically-adjustable telescopic post C upon which the pan is supported, and the pipes *f*² telescopically connected, whereby the burner is adapted to be adjusted in any desired relation to the hole in the top of the stove, substantially as specified.

Signed by me at Springfield, Massachusetts, this 4th day of November, 1898.

DANIEL SIMMONS.

Witnesses:

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M. A. CAMPBELL.