

No. 720,123.

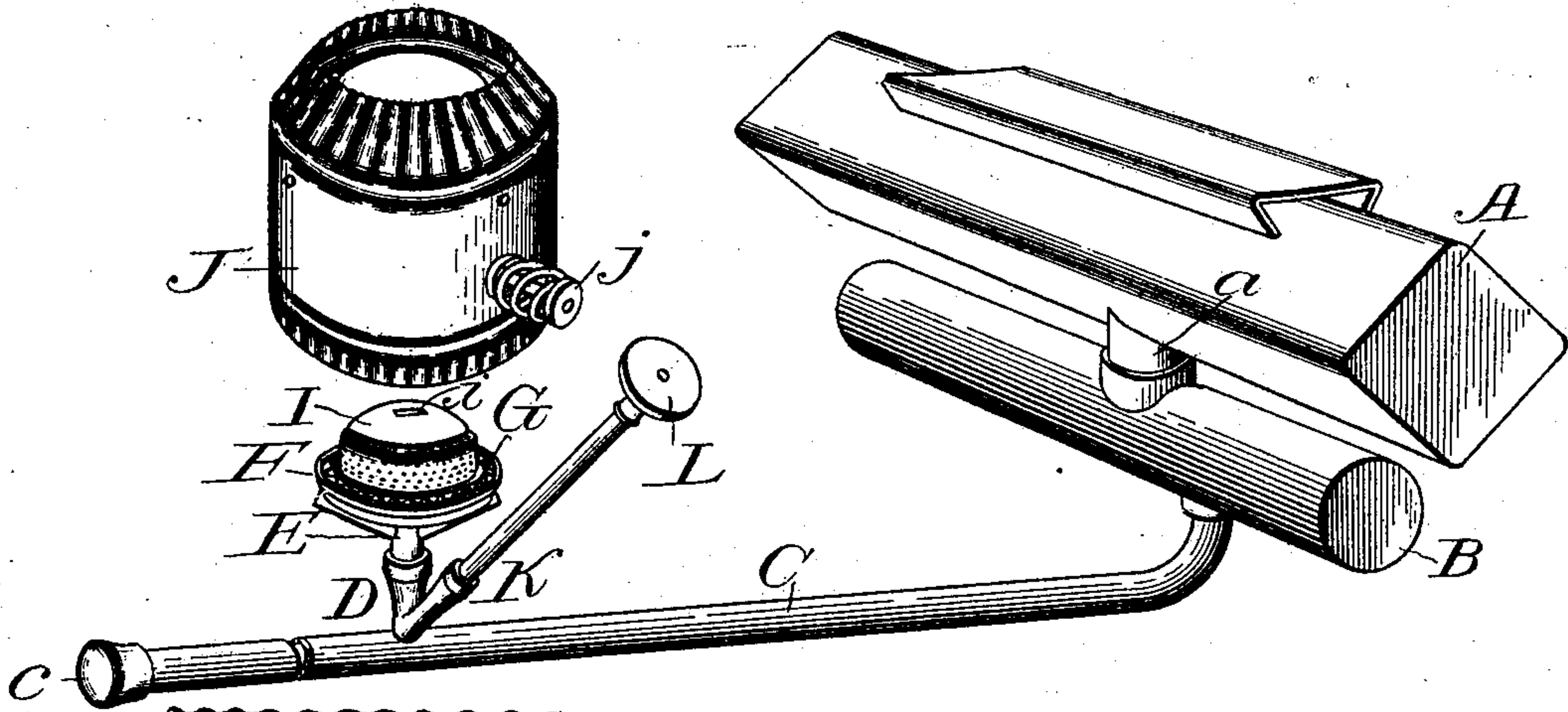
PATENTED FEB. 10, 1903.

G. W. FERDON.  
BLUE FLAME OIL STOVE.  
APPLICATION FILED SEPT. 23, 1902.

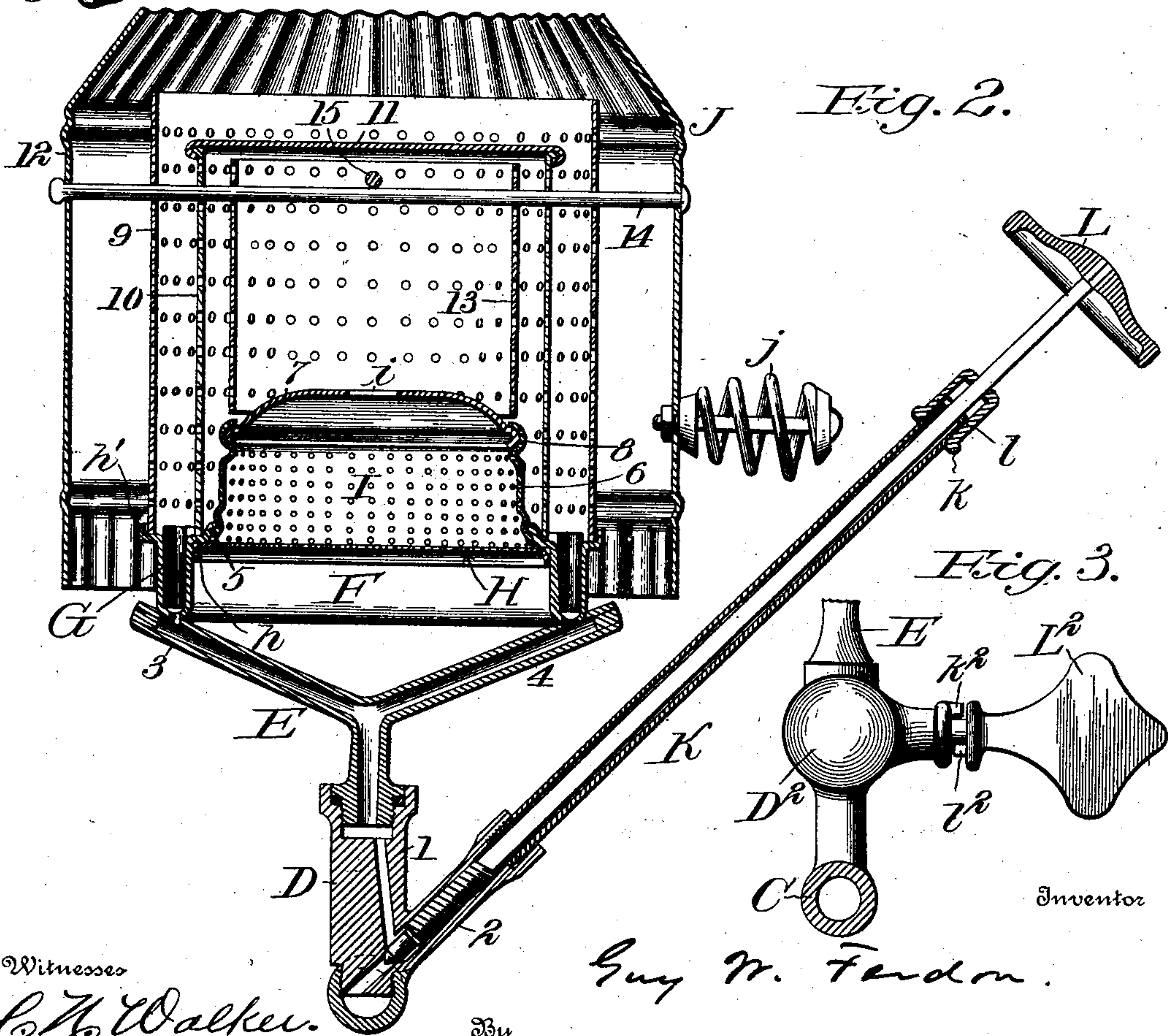
NO MODEL.

2 SHEETS—SHEET 1.

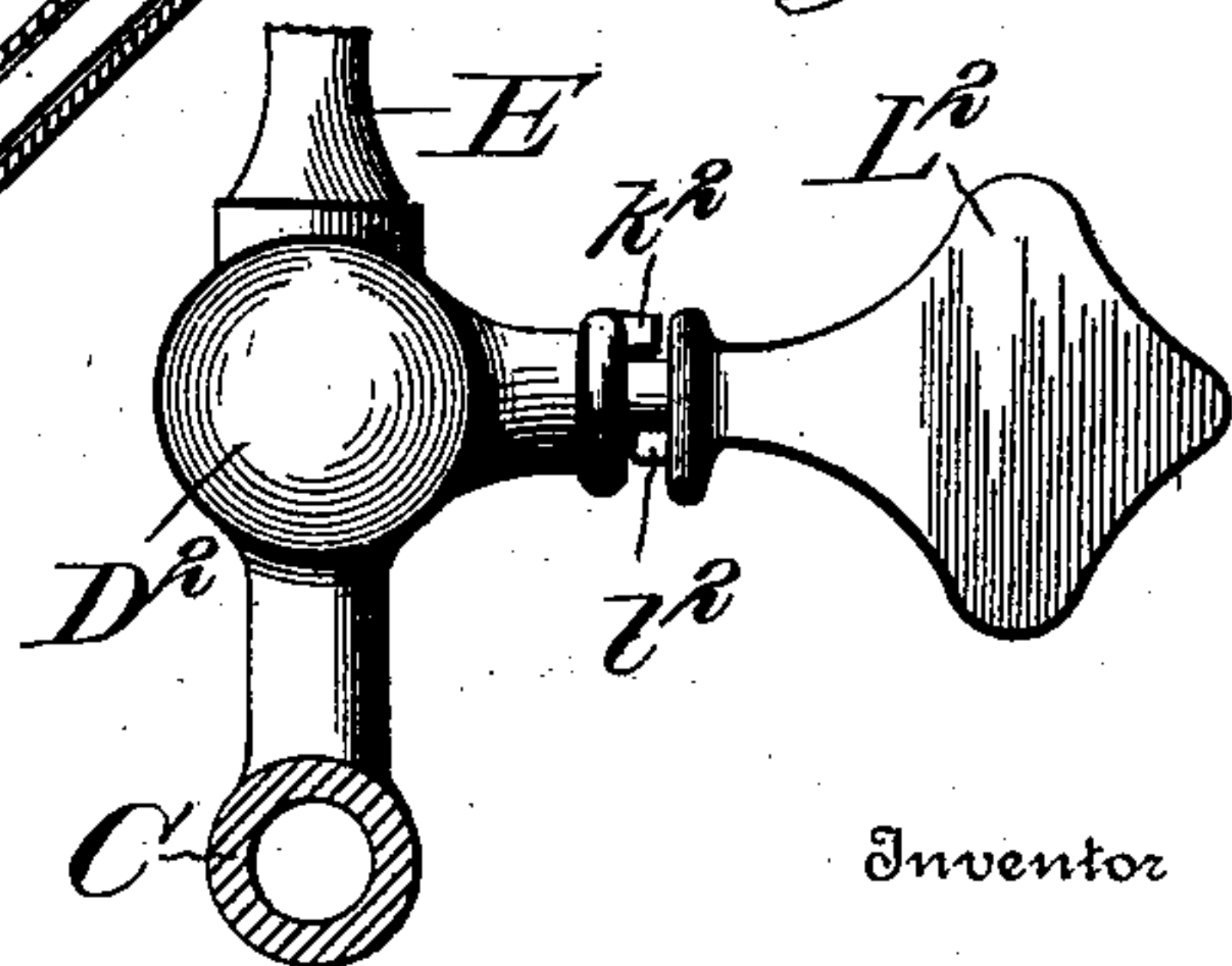
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 4.

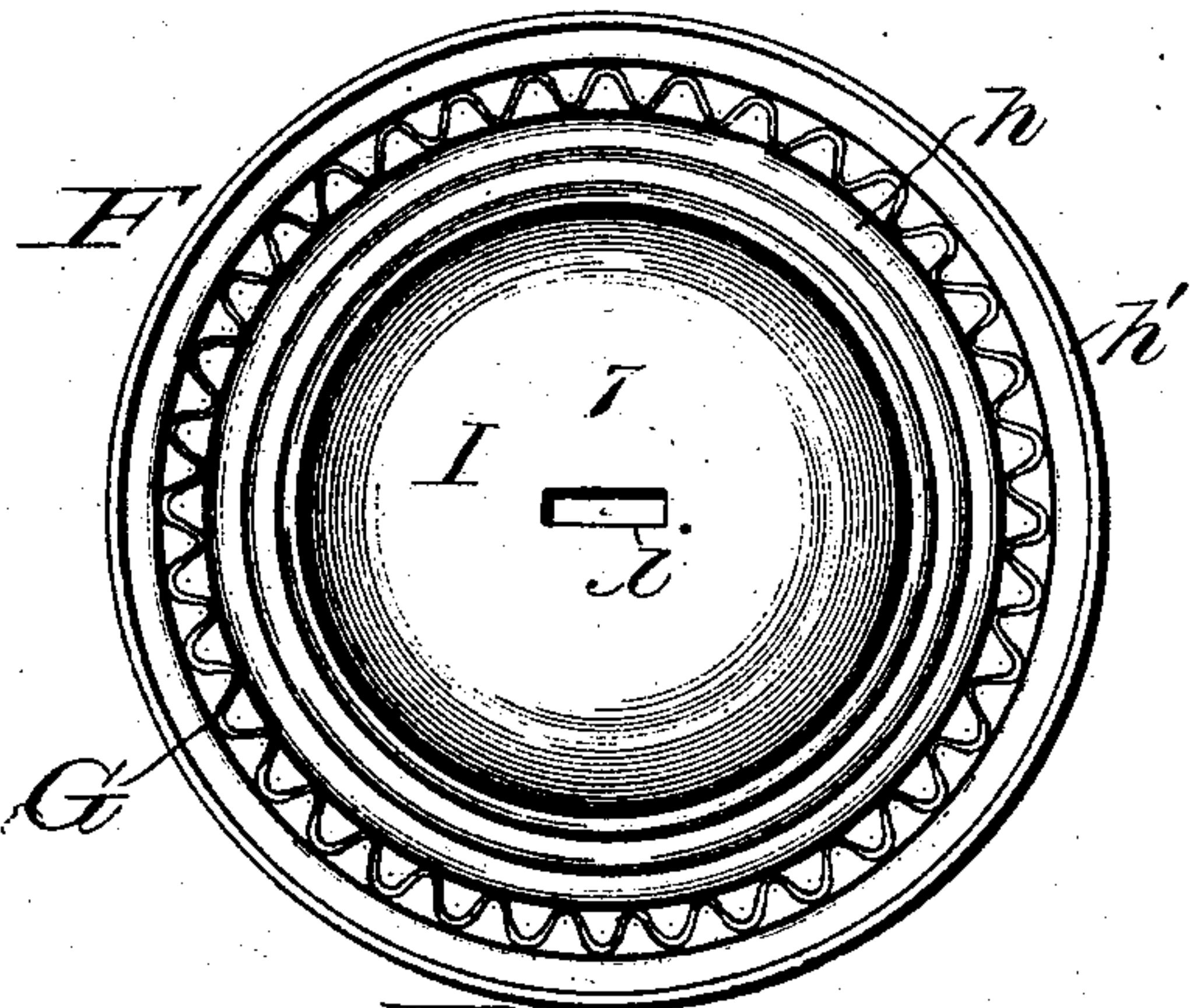


Fig. 5.

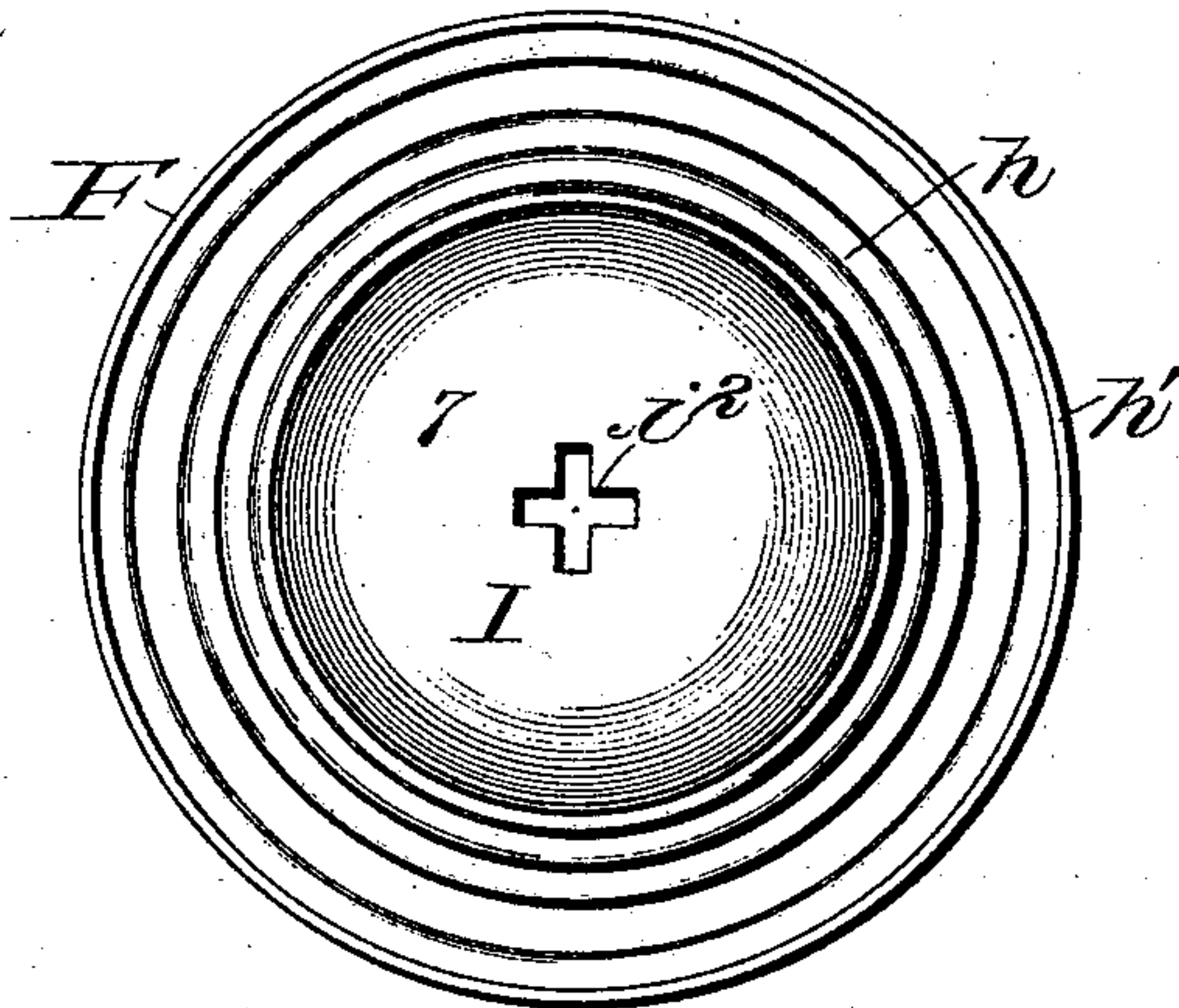


Fig. 6.

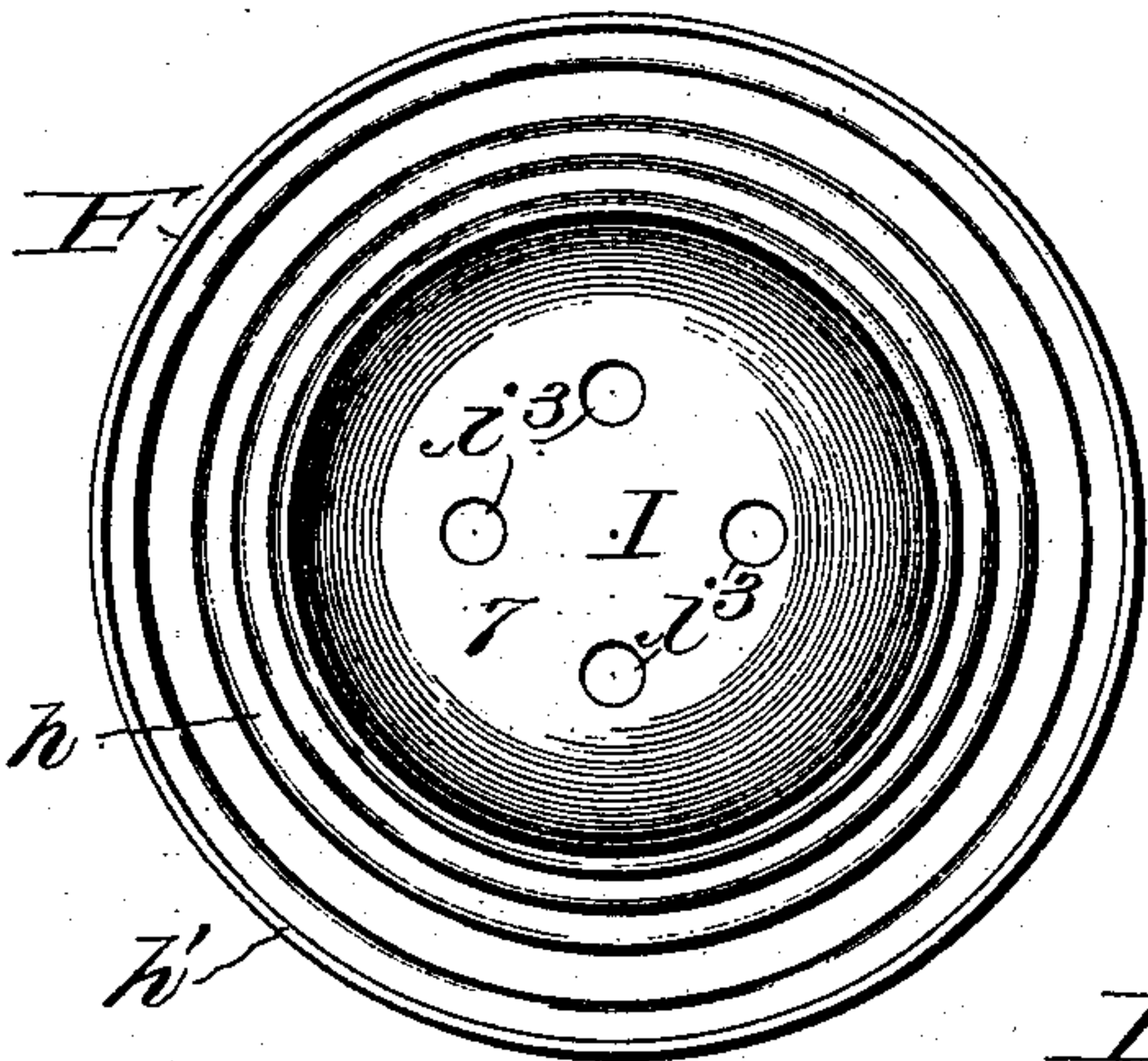


Fig. 7.

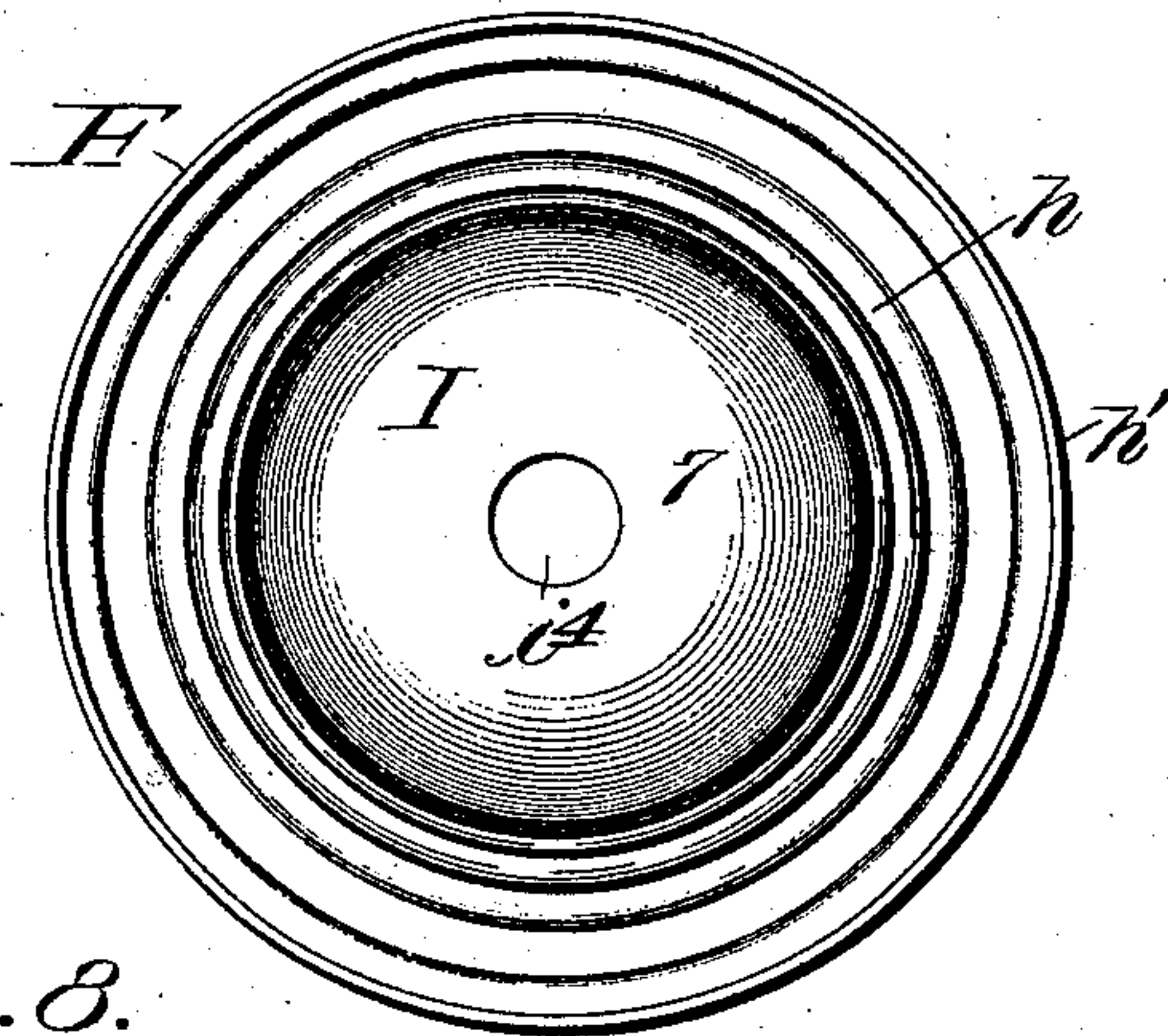
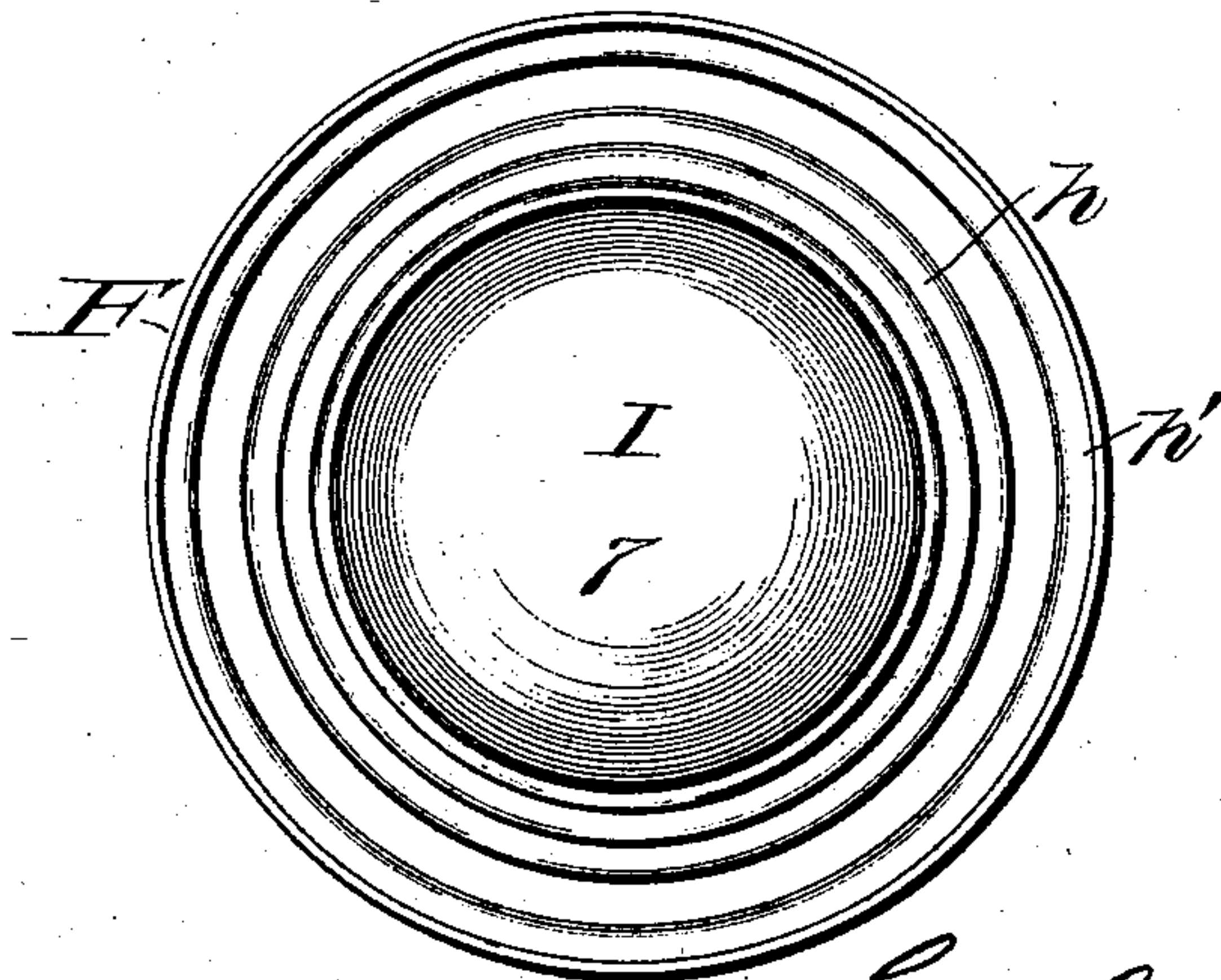


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## BLUE-FLAME OIL-STOVE.

SPECIFICATION forming part of Letters Patent No. 720,123, dated February 10, 1903.

Application filed September 23, 1902. Serial No. 124,578. (No model.)

*To all whom it may concern:*

Be it known that I, GUY W. FERDON, a citizen of the United States of America, and a resident of the borough of Brooklyn, New York city, in the State of New York, have invented a new and useful Improvement in Blue-Flame Oil-Stoves, of which the following is a specification.

This invention consists in certain improvements on the blue-flame oil-stoves heretofore made.

The objects of this invention are to effect a better combustion of the oil by a more proper admixture of air with the vapor, to produce a more even and steady flame of uniform height and that will not flare up, to produce a more nearly odorless flame and a more easily lightable flame, and to wholly dispense with diaphragms within the combustion-drum.

Two sheets of drawings accompany this specification as part thereof.

Figure 1 is a perspective view of an oil-stove burner and its appurtenances with the combustion-drum removed, illustrating this invention. Fig. 2 represents an axial cross-section through the burner, partly in elevation, with the combustion-drum in place. Fig. 3 is a fragmentary section showing a preferred valve; and Figs. 4, 5, 6, 7, and 8 are top views of burners, illustrating different species of the invention.

Like reference letters and numbers indicate corresponding parts in all the figures.

From an upper or "reservoir" tank A through its valved neck *a* the oil is fed into a lower tank B, in which a uniform oil-level is automatically maintained, as in the student's lamp. From this lower tank B a burner-supporting pipe C extends downwardly and horizontally to the required length for one or more burners and terminates in a capped end *c*, through which the pipe may be readily cleaned out when necessary to free it from water or sediment. Each burner is connected with the pipe C by a valve-piece D or D<sup>2</sup>. The valve-piece D is V-shaped, with its legs 1 and 2, Fig. 2, respectively vertical and upwardly inclined. The leg 1 is coupled at its upper end to a Y-shaped tubular connection E, whose lateral

branches 3 and 4 are soldered fast to the bottom of the trough-shaped annular burner F at diametrically opposite points and communicate with its interior. The valve-piece D<sup>2</sup> is interposed between the pipe C and connection E in like manner. The burner F is thus supported on a level with the lower tank B, with the oil-level at about mid-depth of the customary lighting-wick G within the burner when the flow of oil is unobstructed. Within the central air-space of this burner F a diaphragm H, of perforated sheet metal, fits tightly against the bottom of the inner burner-shoulder *h*, Fig. 2, as heretofore, and an air-regulating dome I, of novel construction, is seamed to the flange 5, Fig. 2, that rises above said inner shoulder. This attachment I is composed of perforated side walls 6 and a dome-shaped sheet-metal cap 7, united by a circumferential seam 8, Fig. 2, and the cap 7 is provided with one or more apertures *i*, through which a definitely limited and directed supply of air passes.

The customary combustion-drum J rests upon the burner F and incloses its attachment I, as in Fig. 2. The drum J preferably comprises outer and inner perforated cylinders 9 and 10, forming between them the flame-chamber, the outer cylinder 9 being longest, and a cover or cap 11 at the upper end of the inner cylinder 10 covering the central air-chamber, substantially as shown and described in Letters Patent No. 424,964, granted the 8th of April, 1890, for Frank R. Fennessy's "Improvement in oil or gas burners," with or without the customary sheet-metal jacket 12 surrounding said outer cylinder. Within said air-chamber of the combustion-drum J a supplemental perforated cylinder 13 preferably extends downward from the cap 11 to a point below mid-height of the cone. The perforated cylinders 9, 10, and 13 are fixedly united, one concentrically within another, by "radial" or, more properly speaking, crossed wires 14 and 15, Fig. 2, as set forth in the specification of Letters Patent No. 334,166, granted the 12th of January, 1886, for Otto Ewer's "Improvement in vapor-burners," and are preferably and conveniently united with the jacket 12 in like manner. The custom-



any cold handle *j* provides for manipulating the drum J as a whole and is attached to the jacket 12 or, in its absence, to the outer perforated cylinder 9. The burner-dome I, projecting within the initial yellow flame when the oil within the burner F is lighted at the upper edge of the wick G, protects such flame against drafts to a sufficient extent to render the lighting operation practically free from the escape of smoke or odor. It then serves as a guide in centering the drum J upon the shoulders *h* and *h'* of the burner, so that the drum may be quickly adjusted without danger of misplacement, and, finally, it serves in combination with the burner-diaphragm H and the supplemental perforated cylinder 13 of the drum J to regulate the supply of air to the interior of the flame, so as to insure a practically steady odorless blue flame of uniform height. The sheet-metal top 7 of the dome I causes most of the air rising through the burner-diaphragm H to be fed in the form of jets against the inner perforated wall of the flame-chamber immediately above the burner F, where it most readily mixes with the vapor within said chamber, supplying the vapor with the oxygen necessary to the combustion of its carbon particles. Another large portion of such air passes upward between the inner perforated cylinders 10 and 13 and is fed through the inner cylinder 10 to the flame-chamber as combustion progresses. Another and the coldest portion of the air passes upward through the aperture or apertures *i* of the dome I, as aforesaid, and serves to cool the interior of the drum J and by its escape through the inner perforated cylinders 10 and 13 at top to assist in completing the combustion of offensive gases. It also preferably serves to regulate the flame as to uniformity in height. For this purpose a central oblong aperture *i* is preferably formed in the cap 7 of the dome I, as in Figs. 1, 2, and 4. After the burner is lighted and the blue flame appears at the top of the flame-chamber if there is any irregularity in the flame the drum J is turned by means of the handle *j* until the top of the flame is even. The necessity for such adjustment is due to unavoidable irregularities in the perforated cylinders 9, 10, and 13 and the drum 12 and imperfections in their concentric location with reference to one another. A central cross-shaped aperture *i*<sup>2</sup>, Fig. 5, answers substantially the same purpose, but is liable to be impaired by accidentally bending its inner corners. Four (more or less) apertures *i*<sup>3</sup>, Fig. 6, equidistant from the center, answer substantially the same purpose, but require a number of punchings. A central round aperture *i*<sup>4</sup>, Fig. 7, answers the main purpose of such apertures, but not for regulating the height of the flame. The other objects of the dome I may be accomplished without such aperture or apertures *i* or *i*<sup>2</sup> or *i*<sup>3</sup> or *i*<sup>4</sup>, as illustrated by Fig. 8.

The valve-piece D, Figs. 1 and 2, is supplied,

as heretofore, by an oil-tight tube K, extending obliquely upward in line with the leg 2 of said valve-piece to a point above the oil-level, where it is provided with a cap *k*, soldered fast, as is the tube K, to secure against accidental or mischievous withdrawal of the needle-valve L, which is provided with a cross-pin *l*, Fig. 2, or an equivalent stop to contact with said cap *k* when the valve is fully opened.

In place of the V-shaped valve-piece D, tube K, and long needle-valve L an L-shaped valve-piece D<sup>2</sup> may preferably be interposed between the oil-pipe C and the Y-shaped connection E, as in Fig. 3, said valve-piece being provided with a short key-shaped valve L<sup>2</sup> and these parts respectively with stops *k*<sup>2</sup> and *l*<sup>2</sup>, Fig. 3, to limit the opening movement of the valve. Other like modifications will suggest themselves to those skilled in the art.

The term "oil-stove" as herein used is intended to include stoves either for cooking or for heating adapted to burn kerosene or other varieties of liquid fuel herein generically termed "oil."

Having thus described said improvement, I claim as my invention and desire to patent under this specification—

1. The combination, in a blue-flame oil-stove, of an annular burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder, a dome-shaped attachment secured to said flange and constructed with perforated side walls, and a combustion-drum embracing said burner attachment and seated on said shoulders.

2. The combination, in a blue-flame oil-stove, of an annular trough-shaped burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder, a dome-shaped attachment seamed to said flange and constructed with perforated side walls, and a combustion-drum embracing said burner attachment and seated on said shoulders.

3. The combination, in a blue-flame oil-stove, of an annular burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder, a dome-shaped attachment seamed to said flange and constructed with perforated side walls and an apertured cap, and a combustion-drum embracing said burner attachment and seated on said shoulders.

4. The combination, in a blue-flame oil-stove, of an annular burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder, a dome-shaped attachment seamed to said flange and constructed with perforated side walls, and a cap having a central non-circular aperture, a combustion-drum embracing said burner attachment and seated on said shoulders, and means for turning said drum upon said shoulders.

5. The combination, in a blue-flame oil-stove, of an annular burner having concen-



tric shoulders at top and an upwardly-projecting flange on the inner shoulder, a dome-shaped attachment seamed to said flange and constructed with perforated side walls and a  
5 cap having a central oblong aperture, a combustion-drum embracing said burner attachment and seated on said shoulders, and means for turning said drum upon said shoulders.

6. The combination, in a blue-flame oil-  
10 stove, of an annular burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder, a dome-shaped attachment seamed to said flange and constructed with perforated side walls and an  
15 apertured cap, and a combustion-drum embracing said burner attachment, provided with a supplemental perforated cylinder above said attachment within its air-space, and seated on said shoulders.

20 7. The combination, in a blue-flame oil-stove, of an annular trough-shaped burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder,

a perforated diaphragm beneath said inner shoulder and in contact therewith, a  
25 dome-shaped attachment seamed to said flange and having perforated side walls, and a combustion-drum comprising concentric perforated cylinders seated on said shoulders.

8. The combination, in a blue-flame oil-  
30 stove, of an annular trough-shaped burner having concentric shoulders at top and an upwardly-projecting flange on the inner shoulder, a perforated diaphragm beneath said inner shoulder and in contact therewith, a  
35 dome-shaped attachment seamed to said flange and having perforated side walls, and a combustion-drum comprising concentric perforated cylinders seated on said shoulders and a supplemental perforated cylinder arranged concentrically within its air-space  
40 above said dome-shaped burner attachment.

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