

No. 698,519.

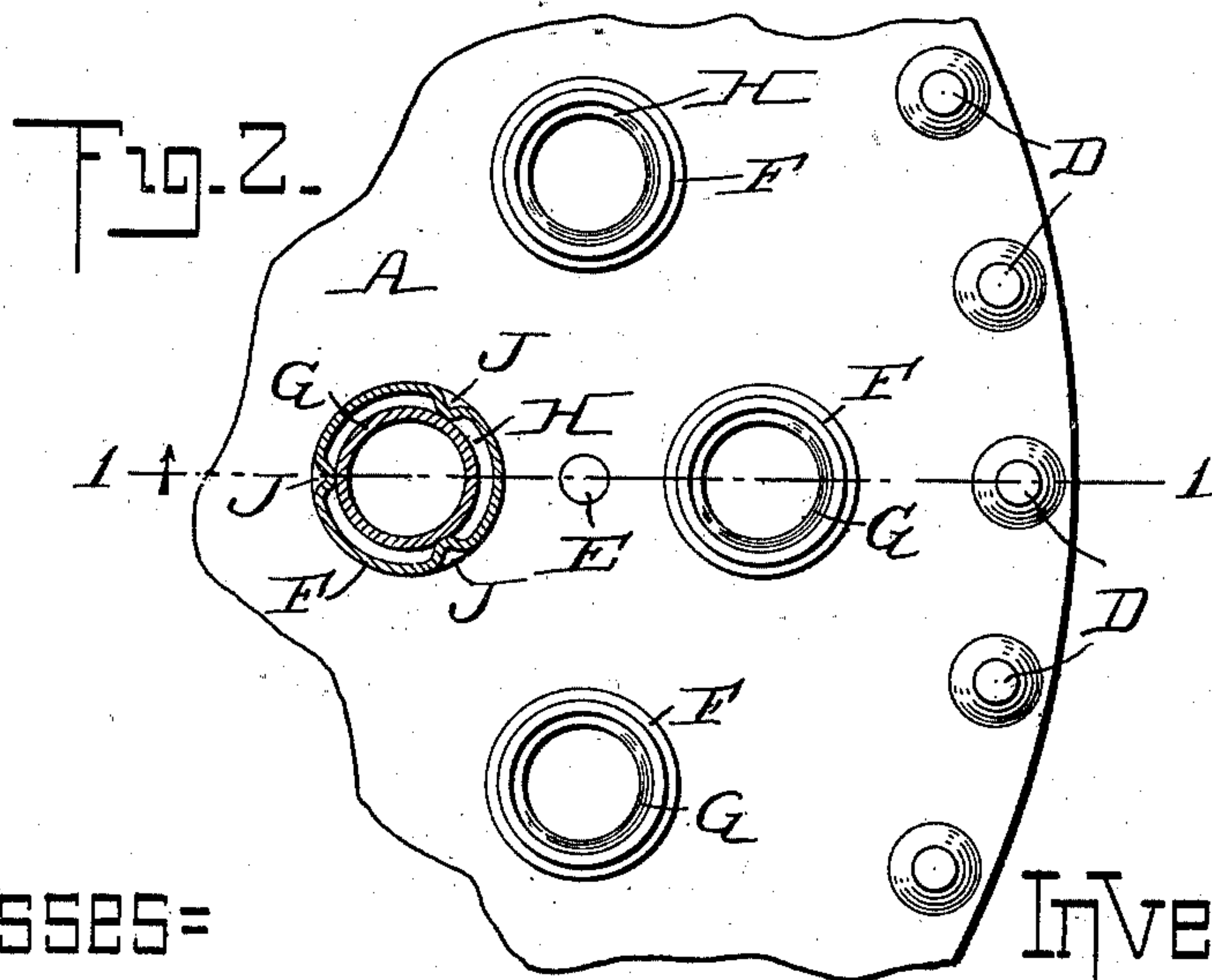
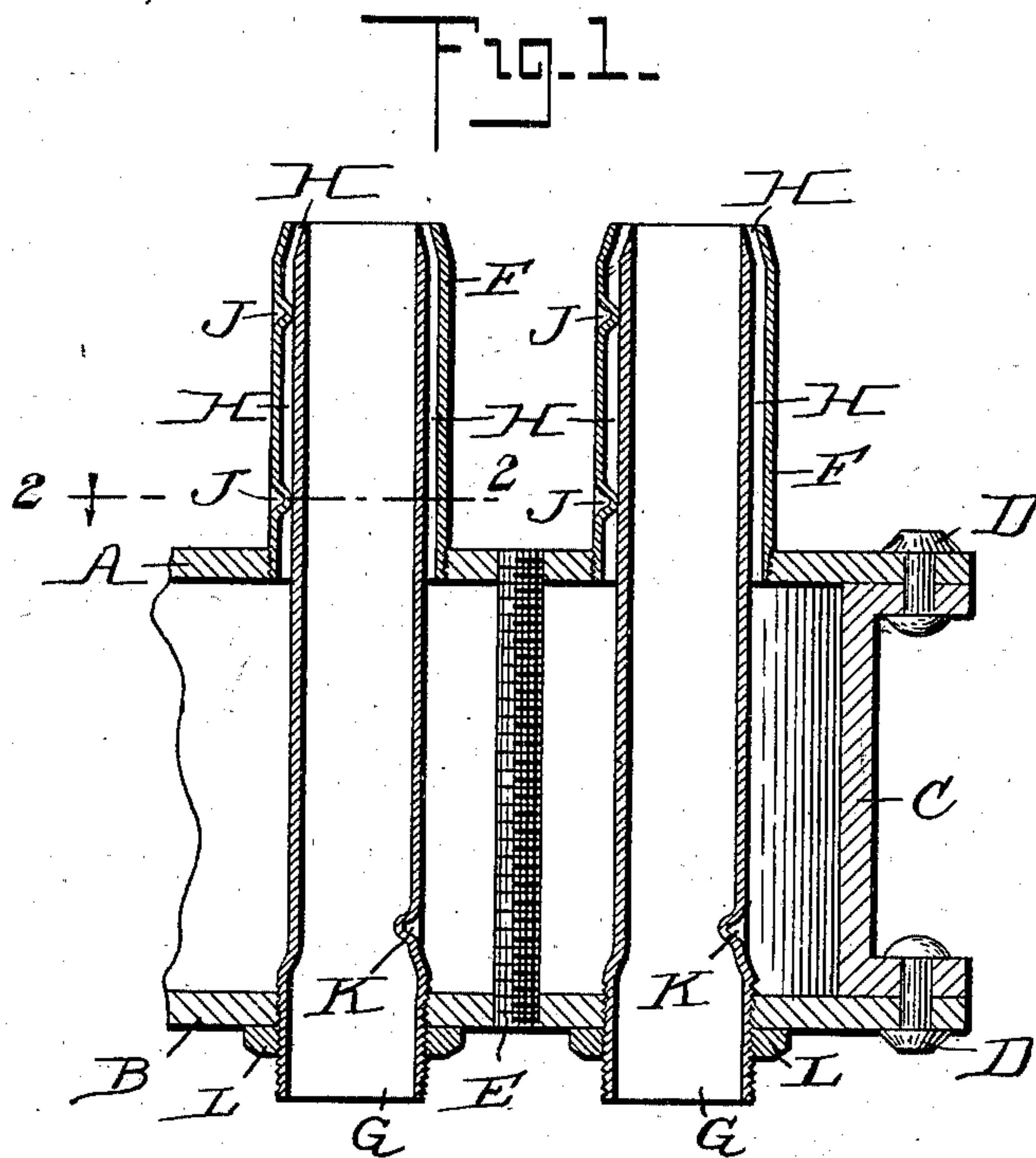
Patented Apr. 29, 1902.

A. W. KENT.  
GAS BURNING HEATER.

(Application filed June 8, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses=

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H. W. Ladd

Inventor=

Alexander W. Kent,  
by A. H. Beecher,  
his Attorney.

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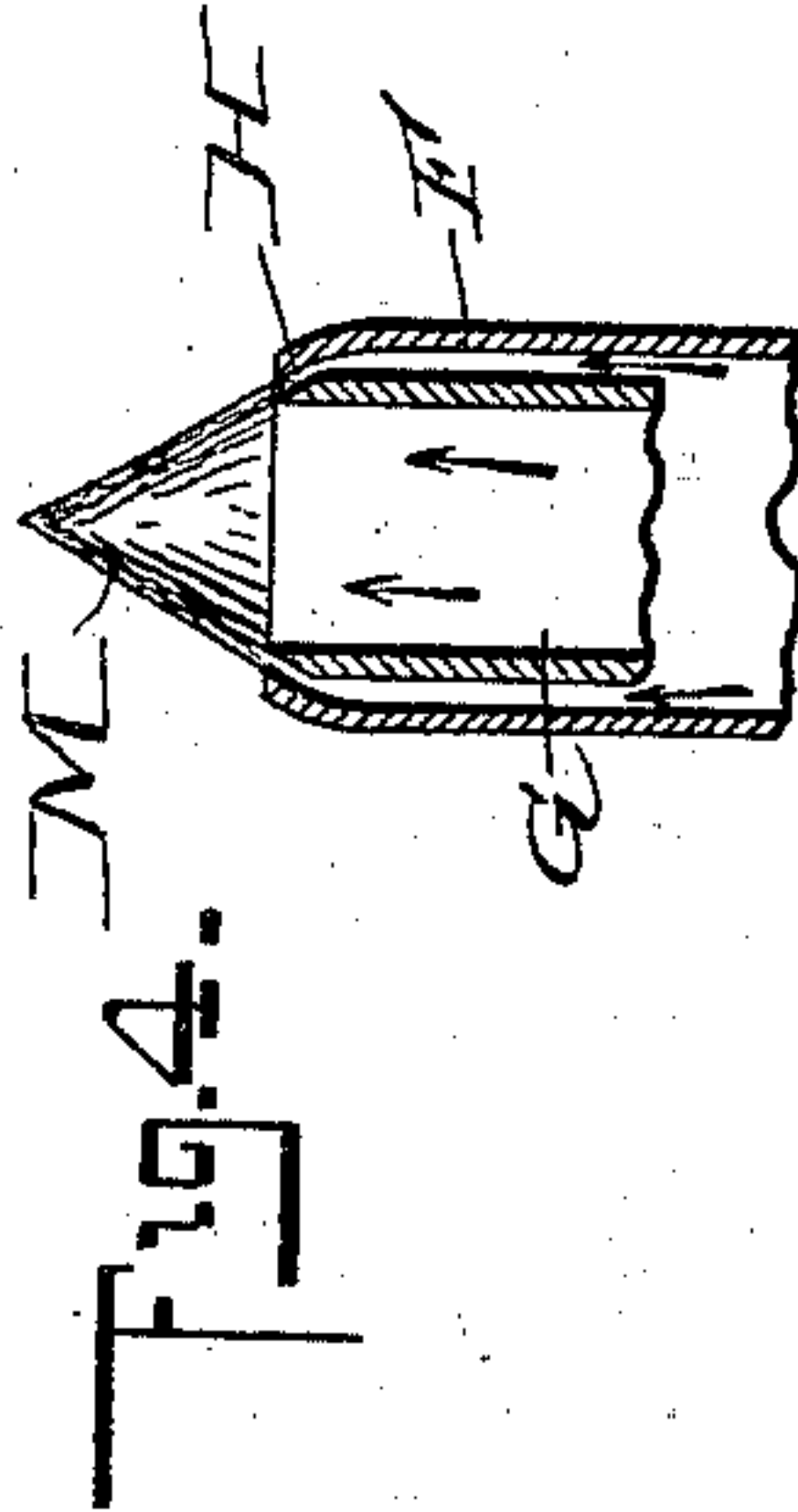
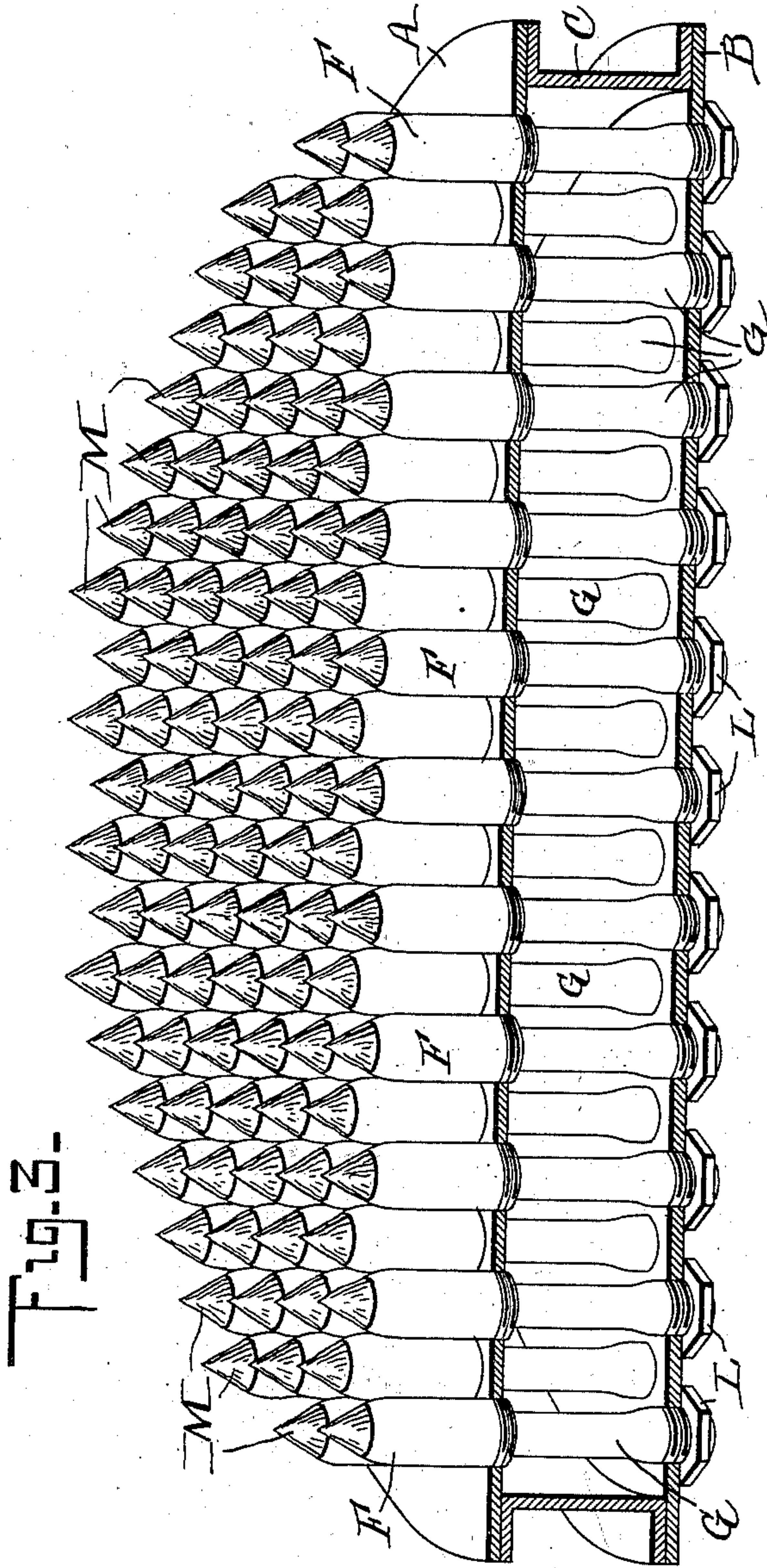
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Witnesses=

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# UNITED STATES PATENT OFFICE.

ALEXANDER W. KENT, OF BOSTON, MASSACHUSETTS.

## GAS-BURNING HEATER.

SPECIFICATION forming part of Letters Patent No. 698,519, dated April 29, 1902.

Application filed June 8, 1900. Serial No. 19,501. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER W. KENT, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Gas-Burning Heaters, of which the following is a specification.

The object of this invention is to provide a gas-burning heater having a gas-holding chamber and a great number of annular burners in each of which the outlet from the gas-passage is made separately adjustable, so that the quantity of gas escaping, and consequently the size of each flame, may be readily regulated.

My invention is embodied in a gas-holding chamber having top and bottom plates, preferably flat and parallel, connected by marginal walls, properly riveted, and by intermediate studs or bolts, such plates having a multiplicity of threaded perforations registering with each other, but smaller in the under than in the upper plate, in combination with concentric tubes adjustably set in said perforations rising to approximately the same height above the upper plate and beveled or flared at the top to overlap somewhat, so as to vary the outlet between them when either tube is adjusted vertically. These tubes will be threaded at the foot to engage threads formed in said plates for adjustment by rotation and to receive a locking-nut, if required. The tubes will be held exactly concentric by means of indentations of the outer tubes bearing against the inner ones or otherwise. The inner tube may be rotated for adjustment while the burner is in use by inserting a suitable instrument into the foot thereof to engage an indentation or other irregularity on its inner wall.

In the drawings, Figure 1 is a vertical section through two of the burners and the edge of the chamber on line 1 1 of Fig. 2. Fig. 2 is a plan of part of the heater, showing one burner in cross-section on line 2 2 of Fig. 1. Fig. 3 represents in section and isometric perspective one of my improved heaters, showing the multiplicity of independent burners, each with its distinct conical flame and all grouped in one effective heater. Fig. 4 shows in section a single burner-top and its hollow flame.

A represents the top plate, B the bottom

plate, and C the marginal wall secured together by a succession of rivets D. If the plates are sufficiently flexible to yield under pressure of the inclosed gas, they will be stayed at intervals by connecting studs or bolts E.

The plates A and B have a multiplicity of threaded perforations to receive the outer tubes F and the inner tubes G, set respectively therein by their threaded lower ends, these tubes being so located and of such length as to be concentric and rise to about the same height, leaving annular gas-passages H between them. To insure the proper concentric position, I prefer to indent the outer tube at points about one hundred and twenty degrees apart, so as to bear against the inner tubes, as at J, Figs. 1 and 2.

The gas-outlet at the upper end of each burner is made adjustable to vary the volume of gas escaping by rotation of either tube. Figs. 1 and 4 represent the inner tube beveled inwardly at top and the top of the outer tube turned inwardly about parallel with such beveled part, thus producing the conical flame M of Figs. 3 and 4. It will be obvious that if the outer tube is screwed slightly down or the inner tube similarly raised these inclined surfaces will approach each other and that they will recede if the movements are reversed. Similarly, one tube may have a radial flange formed on it, extending over the top of the other, and the size of the annular opening may be varied by rotating either tube. I prefer to have the outer tube practically permanent in place and to adjust the inner one with relation to it, as this can be done from beneath the chamber while the burners are lighted, when the effect of adjustment can be observed. An indentation K may be made in the wall of the tube G, or a notch or other irregularity may be formed in its lower end to receive a suitable tool for this purpose. A lock-nut L may be employed to fix each tube in position when adjusted.

My heater is peculiarly effective for steam-making in the boilers of automobiles and for like uses by reason of the intense heat concentrated in a limited space due to the perfect combustion of the closely-set individual burners, each of which produces a persistent perfectly-conical blue flame M, because the



adjustable tubes are held strictly concentric at top, so that the escaping gas is maintained as an unbroken annulus and the flame is deflected inwardly not only mechanically by the parallel terminal offset surfaces of the tubes, but also by the natural tendency of the flame to seek the oxygen in the column of air rising through the inner tube. A heater formed of a multiplicity of such burners separately adjustable and grouped for use as one is substantially unlike any prior structure known to me. The simplicity of the individual burner and the effective grouping of the great number of independent hollow conical flames distinguish my device from all others.

Heaters have before been used having an annular gas-passage surrounding a central air-tube; but I am not aware of any prior heating apparatus composed of a multiplicity of distinct burners of uniform height each formed of two concentric tubes terminally flanged or beveled and relatively adjustable vertically by rotation to vary the area of such passage, and thus to permit regulating each flame independently while the heater is in use.

I claim as my invention—

1. The described heater comprising the gas-holding chamber and a multiplicity of closely-set annular burners of uniform height, each consisting of the concentric tubes F and G

erected respectively in perforations in the upper and lower plates of the chamber, each tube G being threaded at foot, rising through the chamber common to all, and mechanically held central within the corresponding tube F, the outermost of such tubes extending terminally over the other, and one being adjustable vertically, relatively to the other, to vary the annular discharge-orifice, substantially as set forth.

2. The improved heater consisting of the chamber A B C, and a multiplicity of uniform annular burners, comprising the series of tubes F deflected inwardly at top and set in perforations in the top plate A, and the series of tubes G, beveled and mechanically held at top concentric with the tubes F and threaded in the bottom plate B, such tubes G being separately adjustable vertically to vary the area of the annular gas-orifice at the top of each burner, said construction producing a single heater having a great number of distinct and separately-adjustable conical flames, grouped for use as one, substantially as set forth.

In testimony whereof I have affixed my signature in presence of two witnesses.

ALEXANDER W. KENT.

Witnesses:

A. H. SPENCER,  
M. C. POWER.