

C. M. YOUNG.

Vapor Stove.

No. 86,198.

Patented Jan. 26, 1869.

Fig. 1

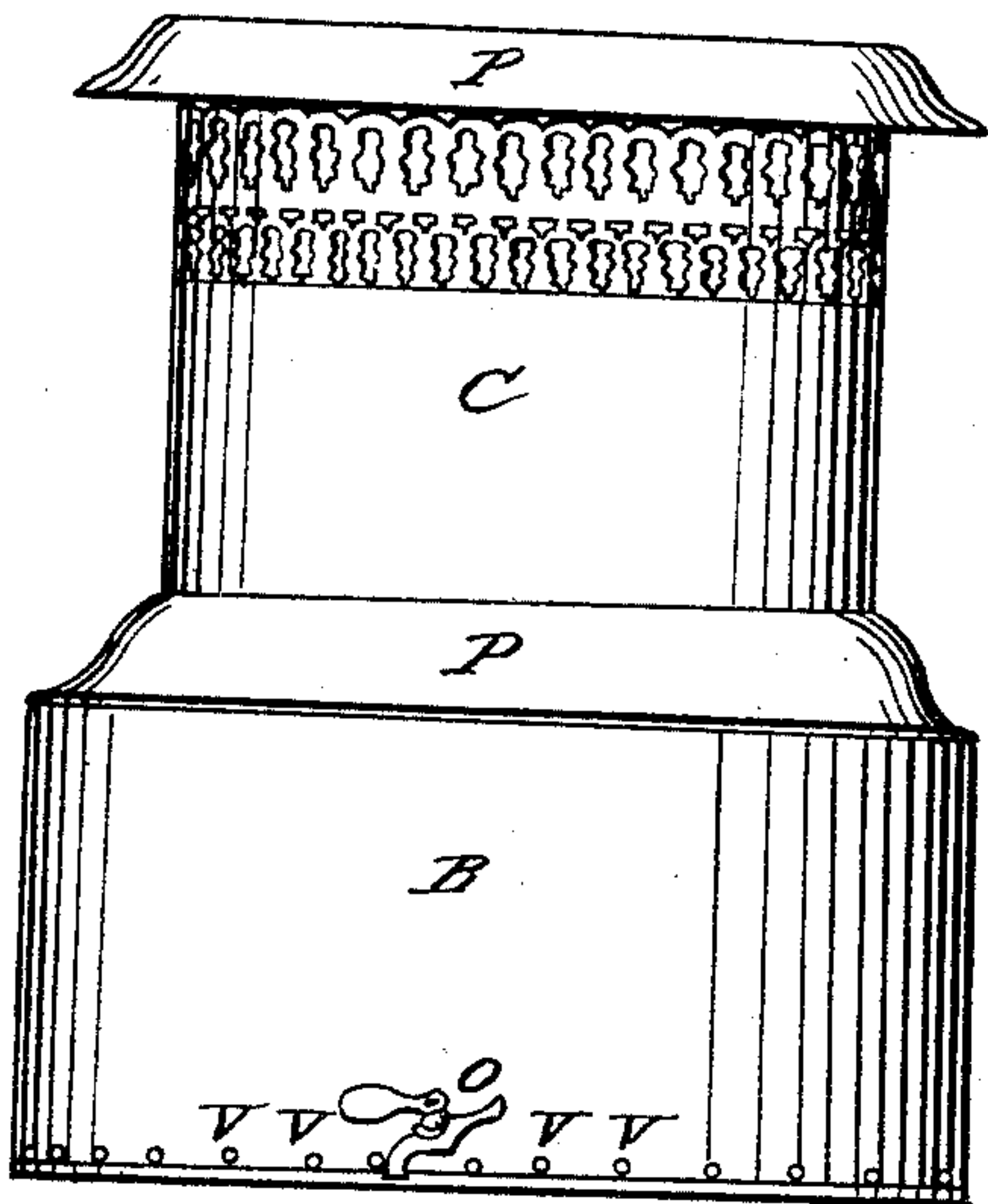


Fig. 2

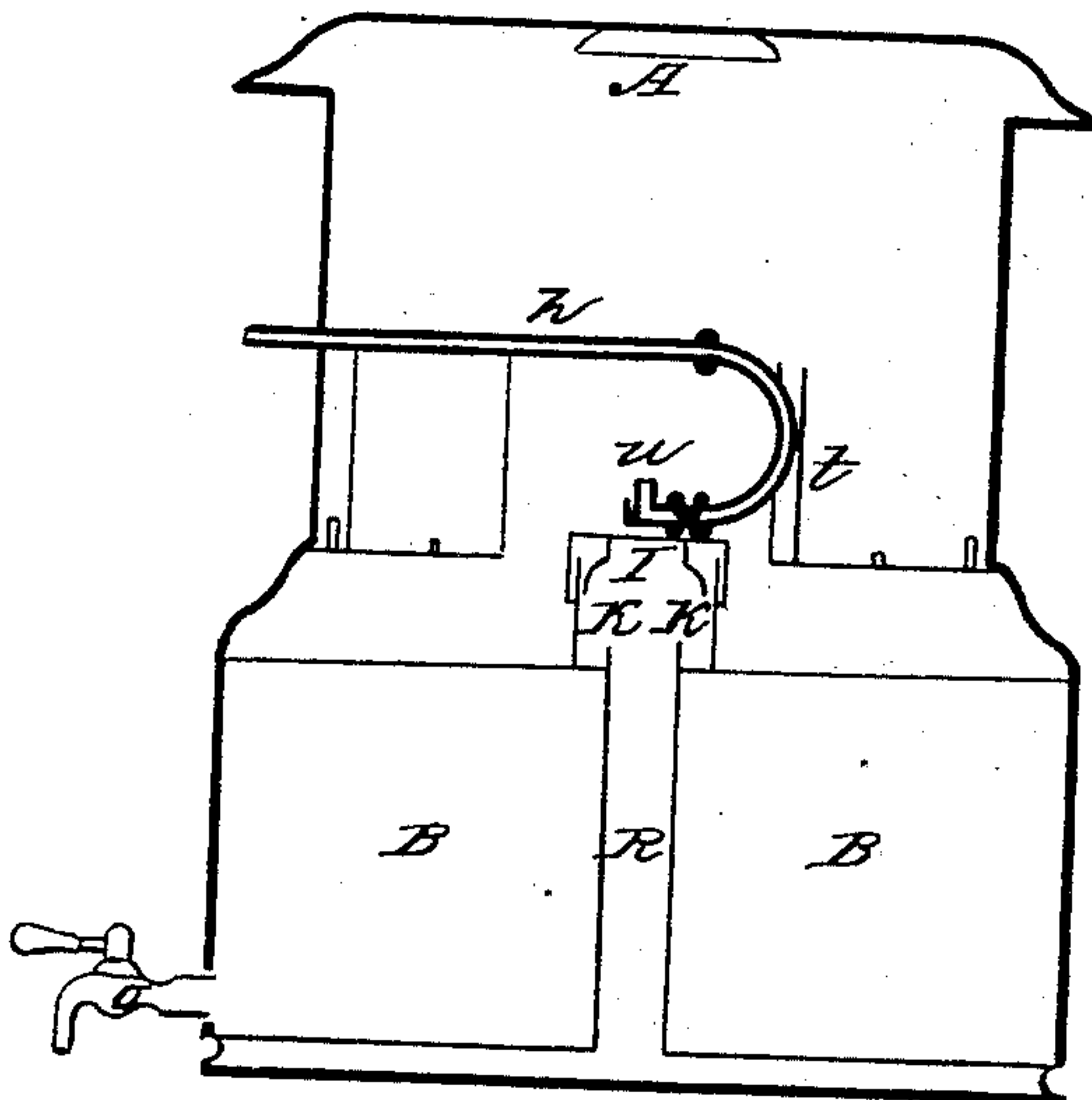


Fig. 3

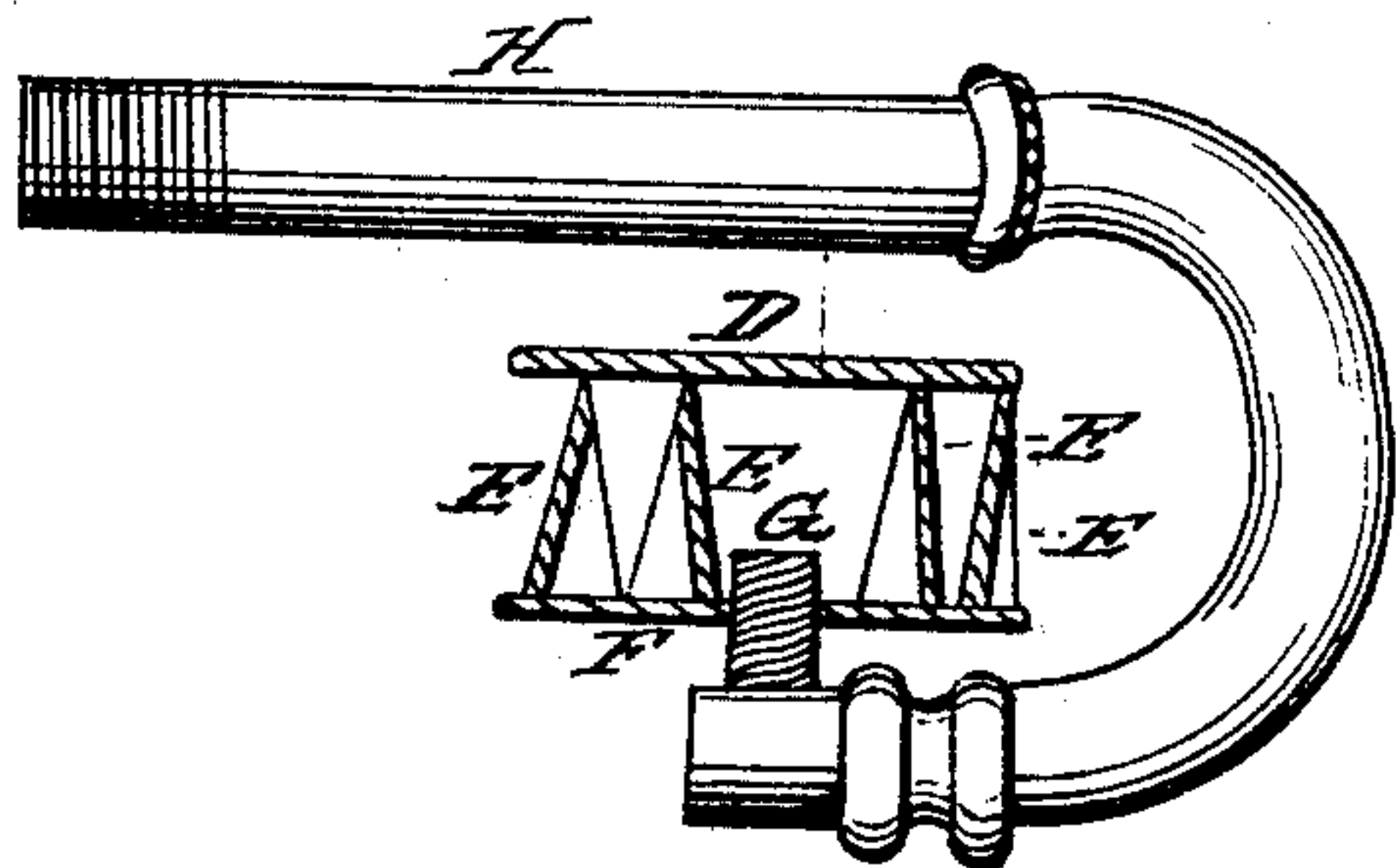


Fig. 4

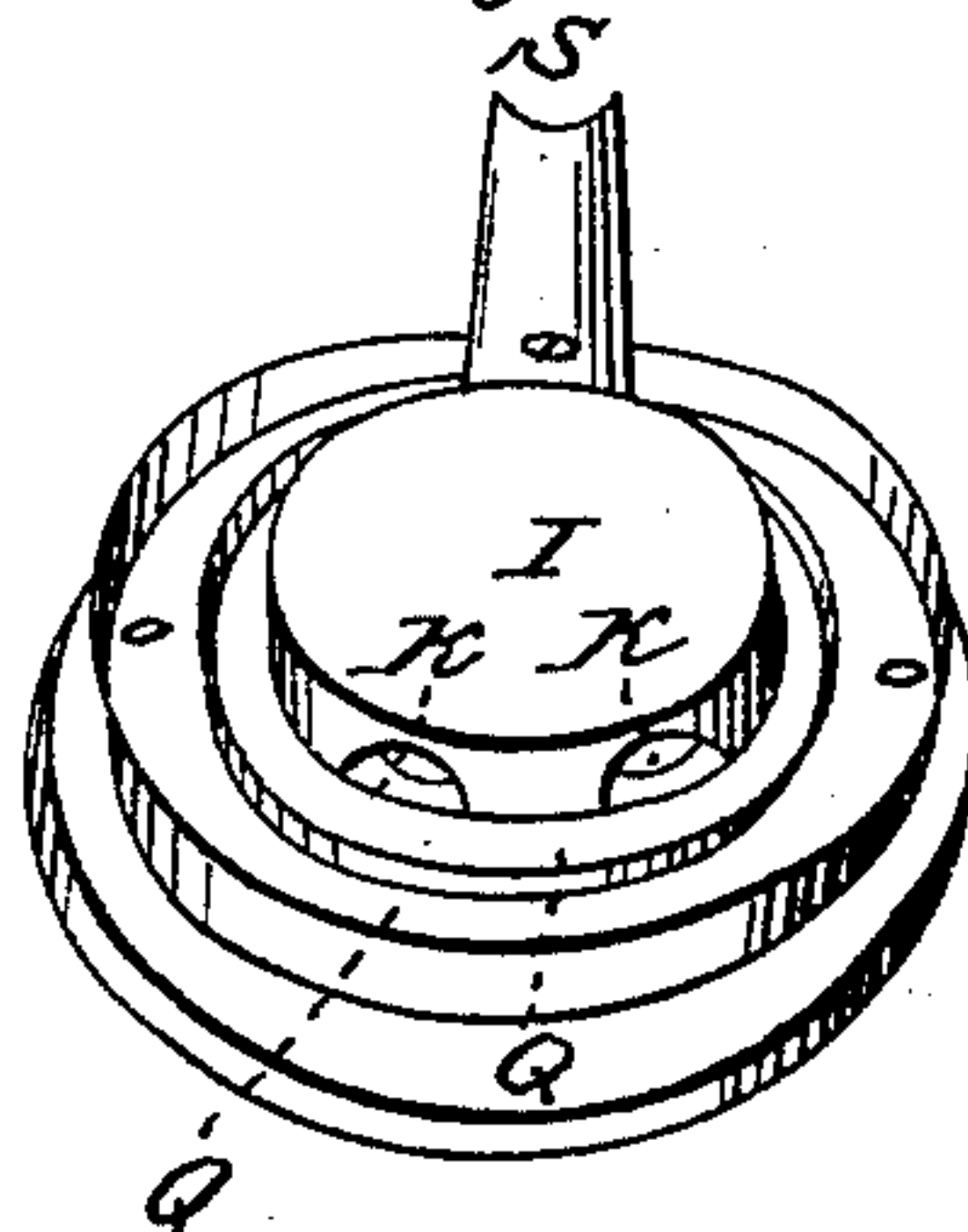
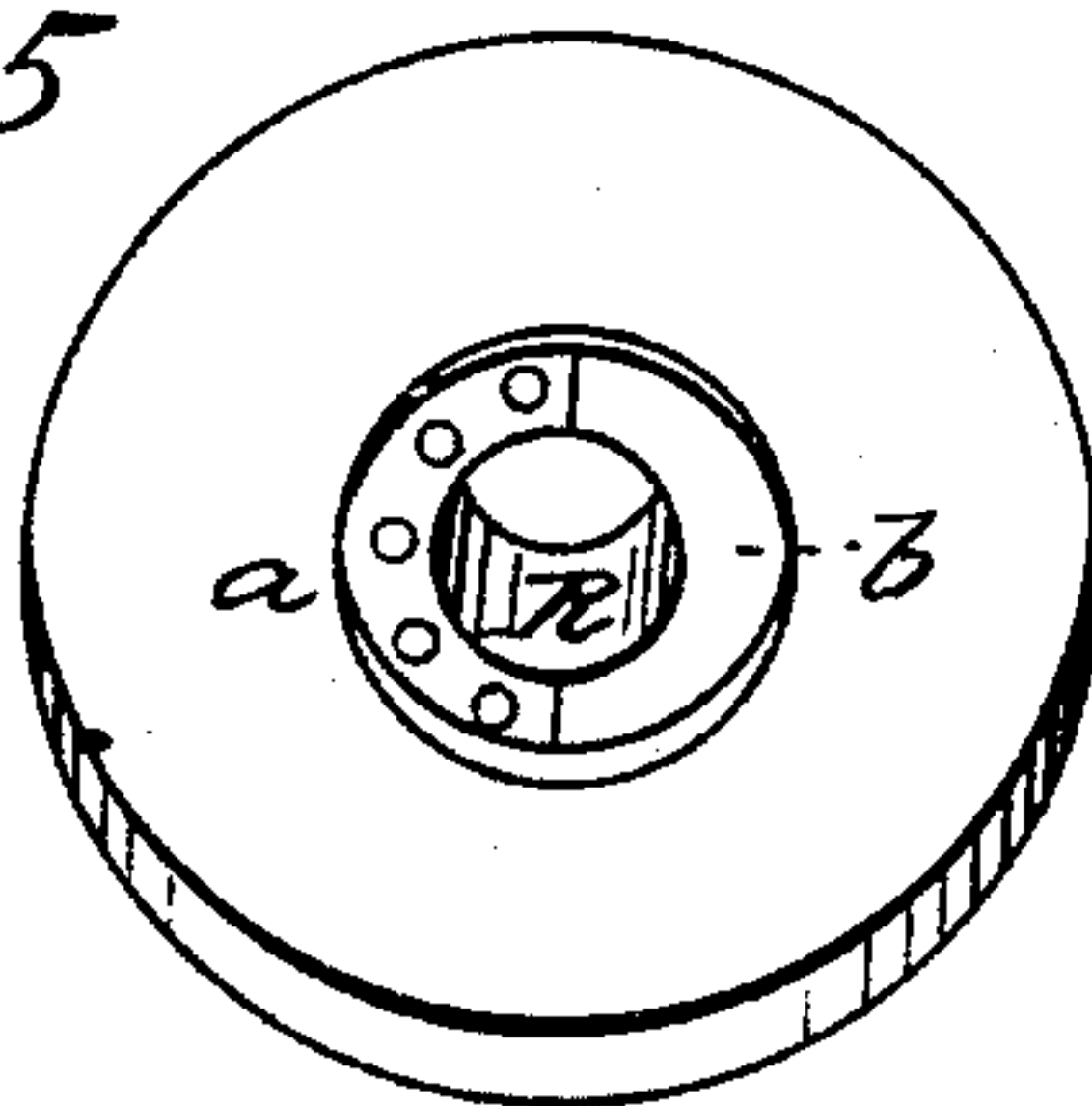


Fig. 5



Witnesses:

Geo. S. Perry

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# UNITED STATES PATENT OFFICE.

CHAS. M. YOUNG, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN VAPOR-HEATERS.

Specification forming part of Letters Patent No. **86,198**, dated January 26, 1869.

*To all whom it may concern:*

Be it known that I, CHARLES M. YOUNG, of the city and county of Philadelphia and State of Pennsylvania, have invented new and useful apparatus, machinery, and devices for burning the vapor of combustible liquids, by which combustion can be effected with entire security, however inflammable or explosive these liquids may be.

My invention may be applied to stoves, furnaces, and all other liquid-burners for purposes of boiling, heating, and cooking in all forms, as well as for other domestic and artistic uses in which an intense, uniform, and well-directed heat is required, and which I have called the "vapor-heater and safety-reservoir."

Parts of my invention may also be applied to the regulation of combustion, as well as to its prevention or arrest.

Of this my invention the following is a description so full, clear, and exact as to enable those skilled in the mechanic arts to which it pertains to construct and those accustomed to the management of domestic implements to use the same, reference being had to the accompanying drawings, in which the same parts are similarly noted throughout, and in which—

Figure 1 represents a perspective view of the whole machine; B and C, its lower and upper sections; P and P', the horizontal circular plates which divide and surmount it; O, the faucet of the safety-reservoir, and V V V, &c., the vent-holes of the air-tube.

Fig. 2 represents a vertical central section of the whole machine; B B, its safety-reservoir, occupying nearly the whole of the lower section, and for brevity similarly noted; R, its air-tube; I, its rotary safety-cap; K K, cuts or sections of the flanges of this cap; *u*, its inside cylinder; *h*, the supply-tube of the burner; S, the arm, and *t* one side of the groove which supports the supply-tube, and A the circular hole in P', which holds the boiler or other implement over the burner.

Fig. 3 represents the upper disk D, its vertical supports E E E E, the lower disk F, movable by a screw round the burner, so as to be raised or lowered over it, the burner G, provided with this screw, and H the supply-tube of the burner.

Fig. 4 represents the rotary safety-cap I,

the arm S, which supports the supply-tube; Q Q, the flanges of the safety-cap, and K K cuts or sections of these flanges.

Fig. 5 represents the air-tube R by its horizontal section; *a*, half the perforated plate surrounding the air-tube, with five of its orifices shown by so many small black circles, and *b* half the fixed safety-cap over the perforated plate.

The nature, construction, and operation of my invention may be more fully described as follows:

Section B of Fig. 1 is the cylinder containing the safety-reservoir, provided with a fire-proof faucet, O, for securely drawing off the surplus combustible fluid collected in the reservoir, and provided, also, with orifices or vent-holes near the bottom, sufficient in number and magnitude to furnish the air-tube with an adequate supply of combustible air for the burner. The cylinder, which contains this lower section, B, extends above the safety-reservoir far enough to receive and retain the circular flange of the horizontal plate P, which surmounts and rests upon this lower section, and into which its flange slides and fits closely. This circular plate P has upon its upper surface two circular grooves, concentric with each other and with itself, to receive and sustain the concentric cylinders of the upper section. This horizontal plate P has round its own center a circular orifice directly over the center of the air-tube of sufficient size to receive the rotary safety-cap. A vertical arm, S, ascends from this plate P near the outer cylinder of the upper section, a little above the inner cylinder of the same section, with a crescent termination, to sustain the supply-tube of the burner, and which tube passes out of the larger cylinder of the upper section to connect with the source of supply of the combustible fluid.

The upper section, C, of Fig. 1 contains two concentric cylinders, which rest upon the grooves in P. Of these cylinders one is, of course, contained within the other, the outer one having about double the elevation of the other. The projection of the outer above the inner cylinder is perforated about equally throughout, so as to admit of sufficient ventilation. The outer cylinder of this section is surmounted by a circular cap, P', which is



held in place by a lower descending flange, in contact all around with the inner circumference of C at the top. The plate P' extends a sufficient distance all around beyond C, and slopes downward at its outside. Concentric with P' is a circular orifice in the same, sufficiently large to receive the bottom of any boiler or other implement of cookery or art, which rests upon a shoulder or flange-like offset in the edge of this orifice, directly over the burner. This orifice is marked A in the drawings.

The sections and plates thus described may be made of tin, iron, copper, zinc, or any other suitable metal. The horizontal plates P and P' may be made of iron, cast or wrought, of sufficient thickness to have the required strength, and the cylinders of sheeted metal polished, plain, or ornate, to suit the taste of makers and purchasers.

The supports of my apparatus may be of any of the common approved forms.

Fig. 3 of the drawings, as already stated, represents the adjustable parallel disks round and over the burner of the same. These disks are of a magnitude suited to the size and power of the burner, and to the effect required to be produced. They can be raised or lowered round and over the burner, so as to increase its combustion and consequent supply of heat. I have found by experiment this change of distance to be necessary not only to increase the combustion, but also properly to mix the vapor which issues from the end of the burner with the air, and to distribute the results equally upon the lower surface of the upper disk, thus preventing the vibration of the flame with its fluttering sound during combustion, and sending the heated air as rapidly as practicable to the boiler or other implement to which it is intended to be applied, where it produces its greatest heating effect. The change of distance is effected by a screw round the burner G, in which the disk F revolves, thus increasing the length of the stem of the burner and changing its distance from the upper disk, D. The distance of the upper disk from the burner can always be found by trial when the burner is applied, and the adjustment once made remains unchanged until the burner is removed.

Fig. 4 in the drawings, as already stated, represents the rotary safety-cap I, placed directly over the air-tube R, so as to regulate the supply of air to the burner and carry off the waste burning fluid which falls upon the rotary safety-cap when lighting up, and which passes round the air-tube into the safety-reservoir below. If desirable, the construction of the safety-reservoir and air-tube may be reversed, so that the surplus or escaping combustible fluid may be conveyed into the safety-reservoir by R, used as a conduit for the purpose, and the part of the lower section, B, over the safety-reservoir may be used as an air-chamber with the vent holes or orifices in its bottom above the safety-reservoir instead of below it, as in the other arrangement. Round the edge of

the circular orifice, over which the safety-cap is placed, there rises a circular flange from the horizontal plate P sufficiently high for the purpose intended, which flange has in it cuts or orifices quite down to the horizontal plate P, sufficient in number and magnitude to admit an adequate supply of air from the air-tube R to the burner G, and carry the waste combustible fluid downward from the burner to the safety-reservoir. Over this flange and resting upon it is the rotary safety-cap I, having a similar flange descending from its lower side to the one above described and surrounding it. The flange of the safety-cap is provided with sections similar to those of the other. The safety-cap can be moved round on this flange and open these cuts or orifices to their full capacity, or close them entirely, if necessary. Like the movable disks, they can be adjusted to suit a burner of any size when first applied, and they will require no further change while it remains. Through these adjustable flanges, as already stated, passes the waste fluid. By the same process both the air and fluid can be excluded.

Another combination of my machinery and apparatus, as shown in Fig. 5, is the perforated plate *a*, through whose orifices the surplus fluid passes down to the safety-reservoir B B and the fixed or imperforated safety-cap *b* of this, round whose edges the waste fluid percolates, to the perforated plate and through into the safety-reservoir. Half of these perforated and imperforated plates is shown in the drawings. The orifices in the perforated one must be of sufficient number and magnitude to allow the whole waste fluid to pass; not so large, however, as to permit the passage of fire or combustion to the safety-reservoir. The uses of the fixed safety-cap are to prevent the communication of fire to the safety-reservoir, and to prevent the escape of gas or gaseous odors from it. The perforated plate or plates (for there may be more than one, if necessary) and the fixed safety-cap are adapted to fill the ring-like space between R, when used as an air-tube, and a larger flange-like tube concentric with it, which rises from the upper part of the safety-reservoir. When the tube R is used as a conduit for the conveyance of the waste combustible fluid into the safety-reservoir the perforated plate or plates and the fixed safety-cap must be arranged in the upper end of this conduit instead of around it, as in the other case. The bottom of the conduit must then be entirely closed and openings be made in its lower part near the bottom to allow the fluid which passes down it to enter the safety-reservoir. This part of my apparatus is believed to be so simple and obvious in its construction as to require no further description. The faucet in the safety-reservoir may be guarded from fire or flame by a perforated plate, wire gauze, or any equivalent device.

In the mode of generating heat before described neither chimney nor escape-flue is



needed, for no smoke, cinders, or odors remain to require their use.

My invention for the safe generation and application of heat as the same is hereinbefore described contains three partial subordinate combinations and one general combination of them all in the attainment of the intended results: First is the combination of the burner and the disks movable over it in the actual production and application of the heat; second is the combination of the rotary safety-cap and air-tube, or an air-chamber and vent-holes to supply the burner with combustible air; third is the combination of the rotary safety-cap, the fixed safety-cap, the perforated plates, and the safety-reservoir with or without R as a conduit, for the secure collection and preservation of any of the waste combustible fluid that may escape the burner by design, negligence, accident, or any other cause; and fourth is the combination of all these in the safe, cleanly, and inodorous generation of heat and its most effective and economical application. These combinations are inseparable parts of my invention for the attainment of the proposed results. They may, however, be separately applicable to stoves, furnaces, and other heaters in which inflammable liquids are used as fuel; and they may thus be applied not only to the production and regulation of heat, but also to the prevention or arrest of fire from being communicated to the combustible fluids.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the parallel disks D and F with the burner G, to which the said disks are attached in such a manner that the distance between the end of the burner and the upper disk may be increased or diminished at will.

2. The combination of the rotary safety-cap I, the flanges Q Q, the orifices or cuts K K, and the air-tube R, or the air-chamber with its vent-holes, for supplying the burner with air.

3. The combination of the movable safety-cap I and its cut flanges with the perforated plates and fixed safety-cap *a* and *b*, ranged round R when used as an air-tube, or in its upper end when used as a conduit for the conveyance of the waste combustible fluid into the safety-reservoir B B, which is part of this combination for collecting and securing the fluid.

4. The combination of all these, or their mechanical equivalents, constructed, arranged, and operated for the safe, cleanly, and inodorous generation of heat from combustible fluids, however inflammable or explosive they may be, and the most economical and effective application of such heat, substantially as above described in the foregoing specification.

CHAS. M. YOUNG.

Witnesses:

JOHN TITUS,  
F. E. FELTON.