

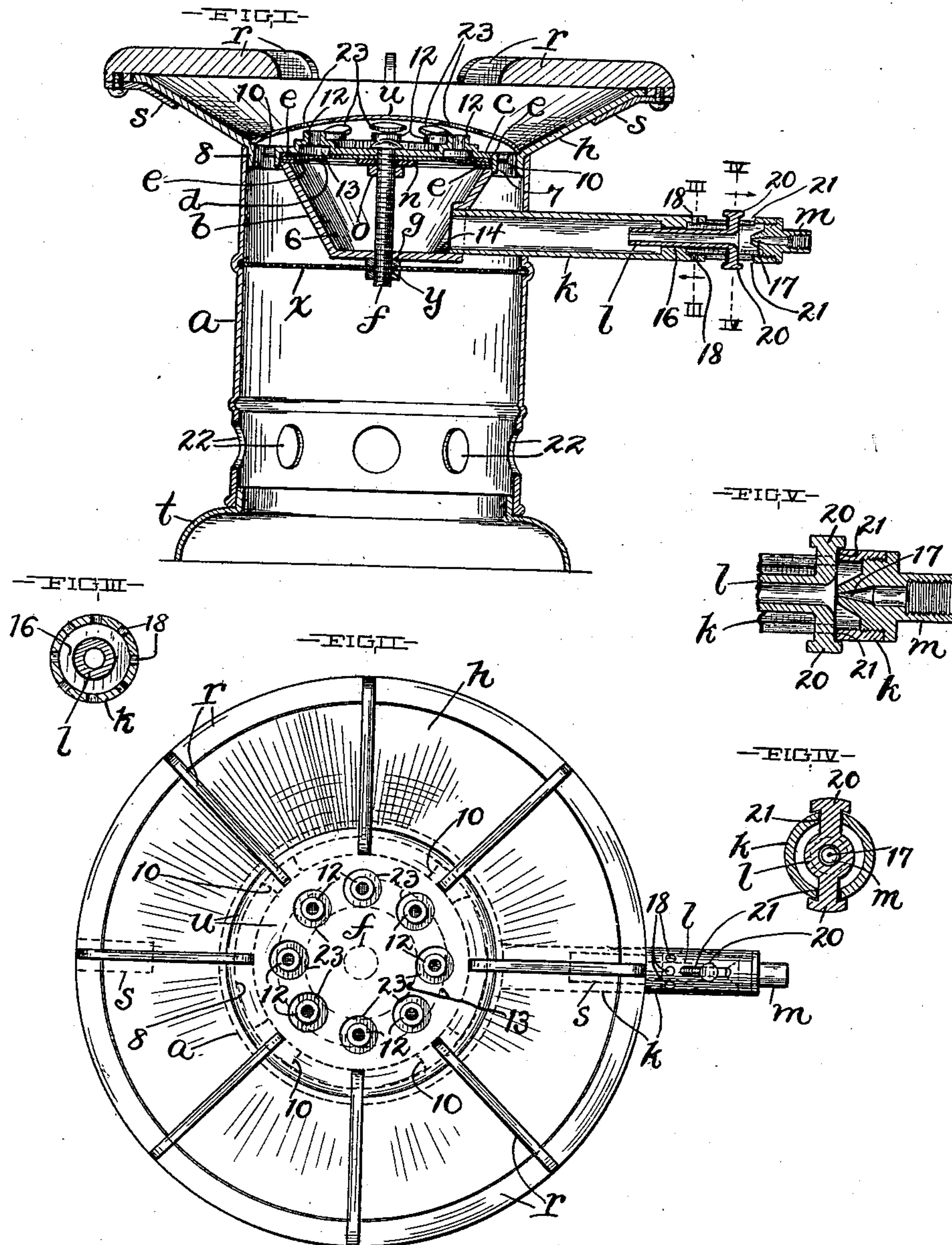
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J. HARRIS.
HEATING AND COOKING STOVE.

APPLICATION FILED OCT. 9, 1901.

NO MODEL.



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HEATING AND COOKING STOVE.

SPECIFICATION forming part of Letters Patent No. 742,643, dated October 27, 1903.

Application filed October 9, 1901. Serial No. 78,079. (No model.)

To all whom it may concern:

Be it known that I, JOHN HARRIS, a resident of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Heating and Cooking Stoves; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to improvements in gas-stoves designed more especially for use in burning acetylene gas and other gases which are rich in carbon, but adapted also for burning coal-gas or any gaseous or vaporous fluid suitable for burning to produce heat and for cooking purposes.

The object of this invention is to provide a stove of the character indicated which has a large heating capacity, which is simple and durable in construction, which will successfully operate with a lower pressure of gas in the gas-supply pipe, which operates noiselessly, which avoids the ingress or backing up of the flame into the burner of the stove, which is long-lived, which has its operation not interfered with by drafts or currents of air about the stove, which has simple and reliable means for regulating the supply of air, and consequently oxygen, required to support the combustion, and which is adapted to operate equally well in any density of atmosphere.

With this object in view the invention consists in certain peculiarities of construction and combinations of parts hereinafter described, and pointed out in the claims.

In the accompanying drawings, Fig. I is a side elevation, largely in central vertical section, of a stove embodying my invention. Fig. II is a top plan of the same. Fig. III is an enlarged vertical section on line III III, Figs. I and II, looking inwardly. Fig. IV is an enlarged vertical section on line IV IV, Figs. I and II, looking outwardly. Fig. V is an enlarged section in detail hereinafter described.

My improved stove comprises an upright metal casing *a*, which is preferably cylindrical. Within the upper end of the casing *a* and centrally within the chamber formed

within the said casing is arranged a burner, which comprises a mixing-chamber 6, wherein the gas and the air or oxygen or the component elements of the combustible mixture which serves as the fuel of the stove mingle. The chamber 6 is formed, preferably, by a cylindrical metal shell *b*, which is cup-shaped and flares upwardly. The cup *b* is suitably supported from the burner cap or head *c*. The cap *c* comprises, preferably, a metal plate, which covers the cup *b* and is provided upon its under side with a depending annular flange or rim 7, which embraces the upper end of the cup *b*. For the purpose hereinafter made apparent a screen *d* is interposed between the upper end of the cup *b* and the under side of the cap *c*. To prevent leakage at the joint between the cup *b* and the rim 7 of the cap, two washers or packing-rings *e* and *e*, composed of fireproof material—such, for instance, as asbestos—are placed against opposite sides, respectively, of the screen *d*, one between the said screen and the upper edge of the cup *b* and the other between the screen and the under side of the cap *c*, and obviously a fluid-tight joint is formed between the upper end of the cup *b* and the cap *c* when the said cup is pressed or drawn upwardly against the cap.

The means employed for drawing the cup *b* upwardly against the cap *c* comprises, preferably, a bolt *f*, which extends centrally and vertically through the cap *c* and through the cup *b* and is arranged with its head bearing against the upper side of the cap and has its shank extending a suitable distance below the cup *b*, and a nut *g* is mounted upon the shank of the bolt at the under side of the said cup. Obviously a proper manipulation of the said nut will result in drawing the cup *b* upwardly and in pressing the screen *d* and washers *e*, interposed between the said cup and the cap, tightly against the under side of the cap.

The cap *c* is rendered stationary in any approved manner; but the burner-support comprises, preferably, an upwardly-flaring annular metal imperforate guard *h*, which rests upon the upper end of the casing *a* and is provided at its lower end with a depending annular flange or rim 8, embraced by the upper end of the said casing. The guard *h* at

the upper end of its rim or flange 8 is provided with inwardly-projecting arms 10, which are arranged at suitable intervals around the burner-cap, which is integral or rigid with the said arms, and preferably the guard *h*, the burner-cap, and the members connecting the said cap with the guard are formed by a single casting.

The burner-cap *c* is provided with several upwardly-projecting and upwardly-discharging tubular projections or nozzles 12. Preferably about eight nozzles 12 are provided. The nozzles 12 are arranged at equal intervals around the central portion of the burner-cap and equidistant from the center of the said cap. The nozzles 12 communicate at their lower end with an annular recess 13, formed in the under side of the cap *c*.

The cup *b* is provided, preferably next above its bottom, with a lateral aperture 14 for the reception of the pipe *k*, which is arranged to discharge into the mixing-chamber 6 and performs the function of conducting the gas and the air or the component parts of the combustible mixture to the said chamber. The pipe *k* is provided internally and a suitable distance from the discharging end of the pipe with an annular flange 16, which embraces and forms a slideway for a correspondingly-shaped inner sliding tube *l*. A gas-supply tube or pipe *m* is fixed to the outer end of the pipe *k* in any approved manner and is provided at its inner end with a gas-discharging orifice 17, arranged to discharge into the passage-way extending through the endwise-adjustable tube *l*. The pipe *k* is provided with any suitable number of lateral apertures or air-inlets 18, which are arranged at suitable intervals around the pipe and establish open relation between the external atmosphere and the chamber or space formed within the pipe *k* around the tube *l* at the outer end of the flange or bearing 16. Obviously more or less air will be supplied to the outer end of the tube *l*, according as the distance between the said end of the said tube and the gas-discharging orifice 17 is increased or decreased. The tube *k* is provided at its outer end with two laterally-projecting and oppositely-located arms or members 20 and 20, which extend through slots 21 and 21, formed in opposite sides, respectively, of the pipe *k* and arranged longitudinally of the said pipe. The arms 20 form members suitable for manipulating the inner adjustable tube *l*. Obviously the arms or members 20, in conjunction with the end walls of the engaging slots 21, form stops for limiting the endwise actuation of the tube *l*. In the operation of the burner hereinbefore described the gas and the air or the oxygen or the component parts of any combustible mixture which is to be formed are supplied to the outer end of the inner and adjustable tube *l* and commingle in their passage through the said tube and through the inner portion of the pipe *k* and are conducted by the pipe *k*

into the mixing-chamber 6, and the screen *d*, which forms a perforated top for the mixing-chamber, is not only instrumental in preventing the backing up of the flames issuing from the burner during the operation of the burner, but materially participates in retarding the flow of the combustible mixture through the said chamber into the recess 13 of the burner-cap, and thereby insures a uniform distribution and commingling of the component parts of the combustible mixture within the said chamber. The recess 13 in the under side of the burner-cap is important to establish a uniform flow of the combustible mixture to the different nozzles or outlets of the burner, distributing the fluid received thereby from the screen *d* to the said outlets. It is important also that the screen *d* be held tightly against the under side of the burner-cap around the bolt *f*, and consequently a washer or packing-ring *n*, composed of asbestos or other fireproof material, encircles the said bolt at the under side of the screen, and a nut *o*, mounted upon the said bolt, holds the said washer or packing and the screen interposed between the packing and the burner-cap tightly against the under side of the said cap, and thereby positively avoids leakage between the cap and the screen around the bolt. The guard *h* protects the flames issuing from the burner-cap from any drafts or currents of air passing across the top of the stove.

A grating or frame *r* of any approved construction and serving to support a cooking utensil or vessel which is placed over the flames issuing from the burner is mounted upon the upper end of the guard *h* in any approved manner, and displacement of the member *r* upwardly from the said guard is prevented by any suitable means—such, for instance, as small metal strips *s*, secured to the said member *r* and closely overlapping the outer side of the guard.

The casing *a* is shown mounted upon a base *t* and at or near its lower end is provided with a series of lateral apertures or air-inlets 22, arranged at suitable intervals around the casing and establishing communication between the external atmosphere and the interior of the casing. The circulation of air around the cup *b*, and especially over the burner-cap *c*, is important to prevent the burner, and especially the discharging-nozzles of the burner, from being burned out. The air received in the casing *a* circulates around the burner, and especially around and over the burner-cap, and to more effectually distribute the air on top of the burner-cap, and especially around the outlets of the cap, a metal hood *u* is provided and extends over the burner in close proximity but somewhat above the outer extremity of the nozzles or outlets of the burner. The hood *u* is preferably supported from the guard *h* in any approved manner; but of course the guard flares upwardly above the hood. The hood *u* is provided with apertures 23 over the burner-nozzles to accommodate

the location and operation of the flames issuing from the said nozzles during the operation of the burner. The hood *u* is preferably concavo-convex and bulges upwardly, so as to gradually enlarge the air-space next above the burner-cap toward the central portion of the said cap, and thereby cause the air to eddy more or less over the central portion of the burner and facilitate the circulation of air around the burner-nozzles.

The openings or spaces formed between the burner-cap-supporting arms 10 of the guard *h* accommodate a free passage of the air from within the upper portion of the casing *a* to and over the burner-cap; but to prevent a rush of air upwardly through the casing from any cause a screen or perforated diaphragm *x* is arranged within and extends transversely of the said casing and is held in place against the under side of the nut *g* between the said nut *g* and another nut *y*, which is mounted upon the shank of the bolt *f* below the said nut *g*.

As already indicated, the stove hereinbefore described is suitable for cooking and heating purposes. For cooking purposes a blue flame is desirable, whereas for heating purposes a whitish flame is desirable. The flame is rendered more blue or more whitish, according as the quantity of air supplied to the burner as an element of the combustible mixture is increased or decreased to the extent required. The construction hereinbefore described and comprising the longitudinally-adjustable tube *l* is important for regulating the supply of air to the said tube. The endwise shiftability of the said tube *l* is also important with a change in the density of the atmosphere. The tube *l*, having been adjusted for any given density of atmosphere, is shifted toward or from the gas-supply orifice, according as the external atmosphere becomes more or less dense. Fig. V illustrates the tube *l* shifted into its extreme outer position, and the arrangement of parts is such that when the said tube *l* is shifted into its said extreme outer position some space shall still intervene between the outer or receiving end of the tube and the gas-supply orifice, and consequently the cutting off of the air-supply entirely is rendered impossible, and I would here remark that the minimum space between the outer or receiving end of the said tube and the gas-supply orifice should be large enough to accommodate an air-supply sufficient to insure a smokeless flame. The arrangement of parts is also preferably such that the air-inlets 18 of the pipe *k* shall be between the outer end of the inner end of the slots 21 and the slideway forming bearing 16, and obviously the slots 21 also form air-inlets for supplying air to the pipe *k* in advance of the gas-supply orifice 17.

What I claim is—

65 1. A stove of the character indicated, comprising a cup forming a mixing-chamber; a cap arranged over the said cup and having

upwardly-discharging flame-feeding outlets; a screen extending over the upper end of the cup between the cup and the cap; means for conducting the component elements of the combustible mixture to the aforesaid chamber below the screen; a washer or packing interposed between the upper edge of the cup and the screen; another washer or packing interposed between the screen and the cap above the said edge of the cup, and means for tightly holding the screen against the central portion of the cap, substantially as and for the purpose set forth. 80

2. A stove of the character indicated, comprising a cup forming a mixing-chamber; a cap arranged over the cup and having upwardly-discharging outlets; a screen arranged at the under side of the cap and forming the top of the mixing-chamber; and means for supplying the component elements of the combustible mixture to the said chamber below the screen; a support for the aforesaid cap; a bolt extending centrally through the cup and through the cap and a nut cooperating with the bolt in holding the cup to the cap; a nut upon the shank of the bolt within the cup, and a washer or packing interposed between the last-mentioned nut and the under side of the screen, substantially as and for the purpose set forth. 95

3. A stove of the character indicated, having a flame-feeding portion comprising an approximately flat cap having upwardly-discharging vertically-arranged nozzles; a chamber arranged under the said cap and in open relation with the passage-ways formed by the nozzles; means for conducting the component elements of the combustible mixture to the said chamber; a hood covering the aforesaid cap and having apertures directly over the nozzles, substantially as and for the purpose set forth. 100

4. A stove of the character indicated, having a flame-feeding portion comprising a cap constructed to form upwardly-discharging outlets; a cup forming a chamber arranged under the said cap and being in open relation with the said outlets; means for conducting the component elements of the combustible mixture to the said chamber; a hood covering the aforesaid cap and having apertures arranged directly over the aforesaid outlets, and means for conducting air from the space around the aforesaid cup to the space between the hood and the cap, substantially as and for the purpose set forth. 110

5. A stove of the character indicated, comprising the following: a cup forming a mixing-chamber, a screen arranged transversely of the upper end of the said cup, a cap extending over the screen and provided with several upwardly-discharging outlets and a recess formed in the under side of the cap and connecting with the said outlets, means for conducting the component elements of the inflammable mixture to the aforesaid chamber, a hood extending over the said cap and 125 130

having apertures arranged directly over the aforesaid outlets, and means for conducting air from the space around the aforesaid cup to the space between the hood and the cap, substantially as and for the purpose set forth.

6. A stove of the character indicated, comprising the following: a mixing-chamber; a screen arranged transversely of the upper end of the chamber; a cap extending over the screen and provided with several upwardly-projecting nozzles and a recess formed in the under side of the said cap and connecting with the passage-ways formed by the nozzles; means for conducting the component elements of the inflammable mixture to the aforesaid chamber; a guard surrounding and extending upwardly from the cap; a hood supported from the guard and extending over and above the said cap and having apertures arranged over the aforesaid nozzles, and means for conducting air to the space between the hood and the cap, substantially as and for the purpose set forth.

7. A stove of the character indicated, having a cup forming a mixing-chamber; a cap extending over the cup and provided with upwardly-projecting and upwardly-discharging nozzles in open relation with the aforesaid chamber; means for conducting the component elements of the combustible mixture to the aforesaid chamber; a hood arranged over and above the said cap and having apertures arranged over the aforesaid nozzles, and an air-receiving casing surrounding the aforesaid cup and in open relation with the space formed between the hood and the cap, substantially as and for the purpose set forth.

8. A stove of the character indicated, having the following: an outer air-receiving casing *a*; an upwardly-flaring guard *h* mounted

upon the upper end of the said casing; a cup arranged within the upper portion of the said casing; a cap over the said cup, which cap is rigid with the aforesaid guard and has several upwardly-projecting nozzles arranged at suitable intervals around the central portion of the cap; means for securing the cup to the cap; a screen within the aforesaid casing at the under side of the cup; a hood extending over and above the cap and having apertures over the aforesaid nozzles; connections between the interior of the aforesaid casing and the space formed between the hood and the cap, and means for conducting the component elements of the combustible mixture to the aforesaid cup, substantially as and for the purpose set forth.

9. In a stove of the character indicated, the combination, with the mixing-chamber where- in the component elements of the combustible mixture commingle, and a pipe arranged to discharge into the said chamber and having an internal annular bearing forming diametrical enlargement 16, of an endwise-slidable commingling-tube having bearing in the said enlargement of the aforesaid pipe, which tube is in open relation, at its outer end, with the external atmosphere, and has the said end provided with a laterally-projecting arm, and a gas-supply pipe arranged to discharge into the outer end of the commingling-tube, and the first-mentioned pipe being slotted to accommodate the location and operation of the aforesaid arm, substantially as and for the purpose set forth.

Signed by me at Cleveland, Ohio, this 18th day of September, 1901.

JOHN HARRIS.

Witnesses:

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TELSA SCHWARTZ.