(No Model.) 2 Sheets—Sheet 1.

W. C. BUCKLIN.

GAS STOVE.

No. 427,666. Patented May 13, 1890.

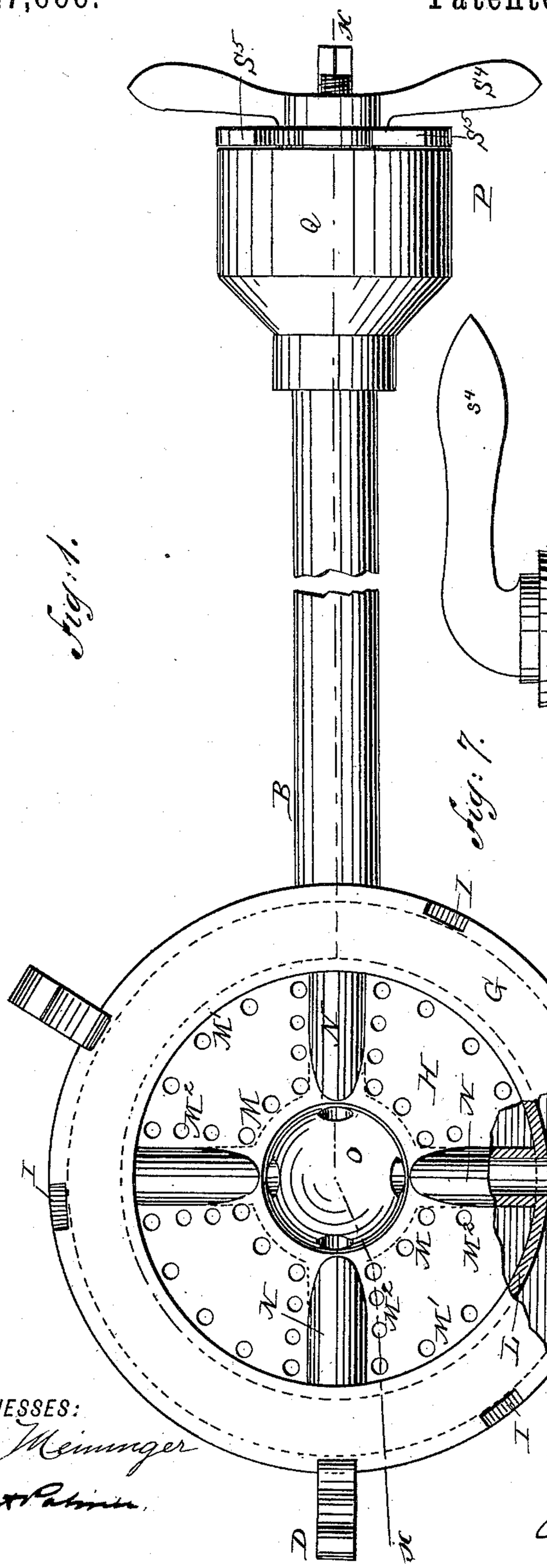

Fig. 1.

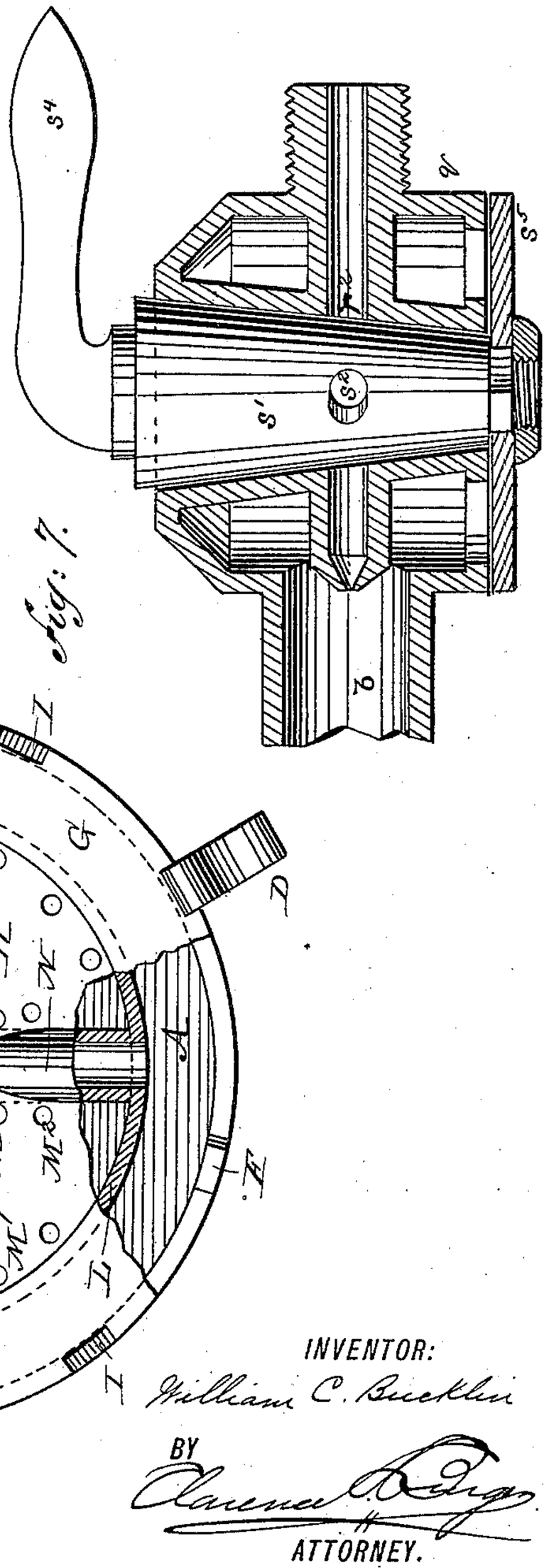

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

W. C. BUCKLIN.

GAS STOVE.

No. 427,666. Patented May 13, 1890.

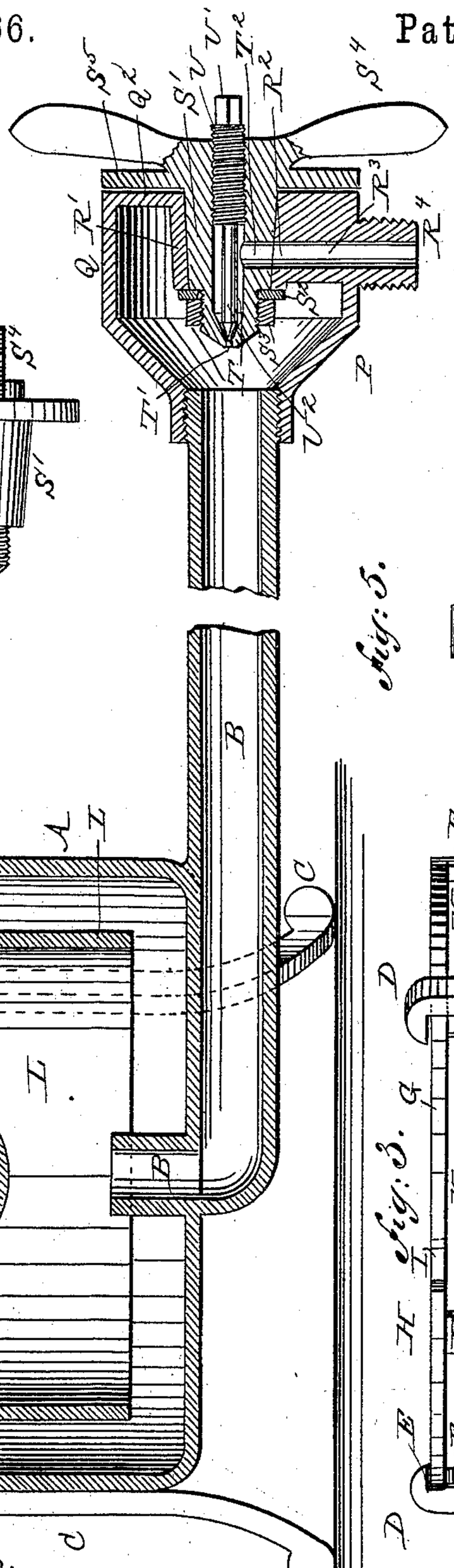

Fig: 2.

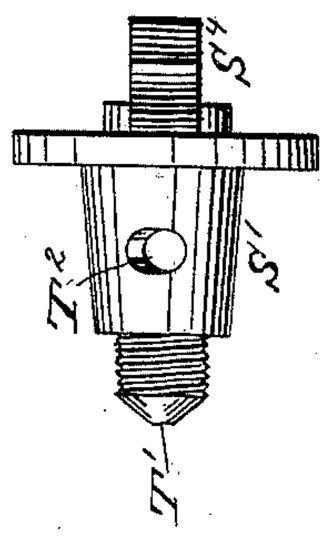

Fig: 6.

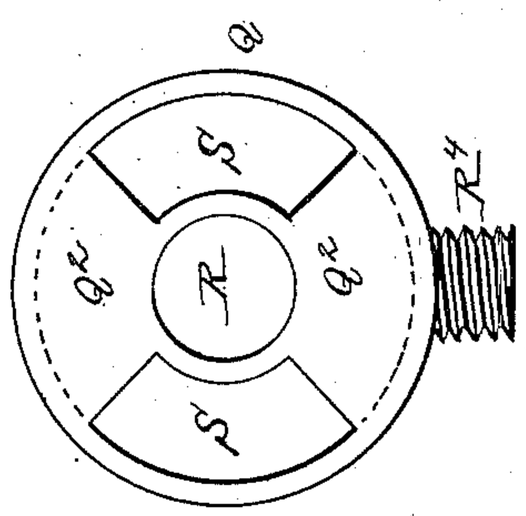

Fig: 4.

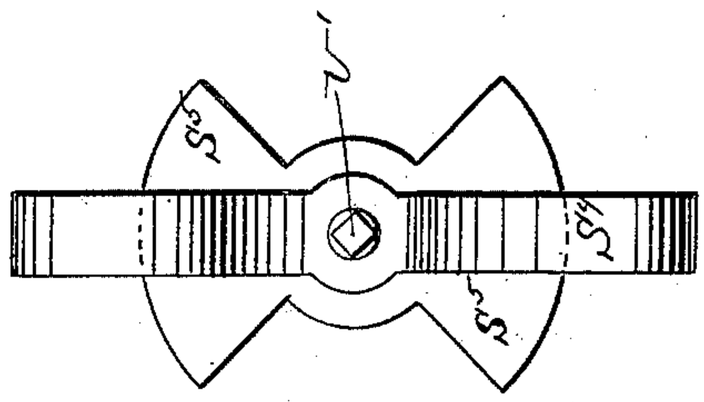

Fig: 5.

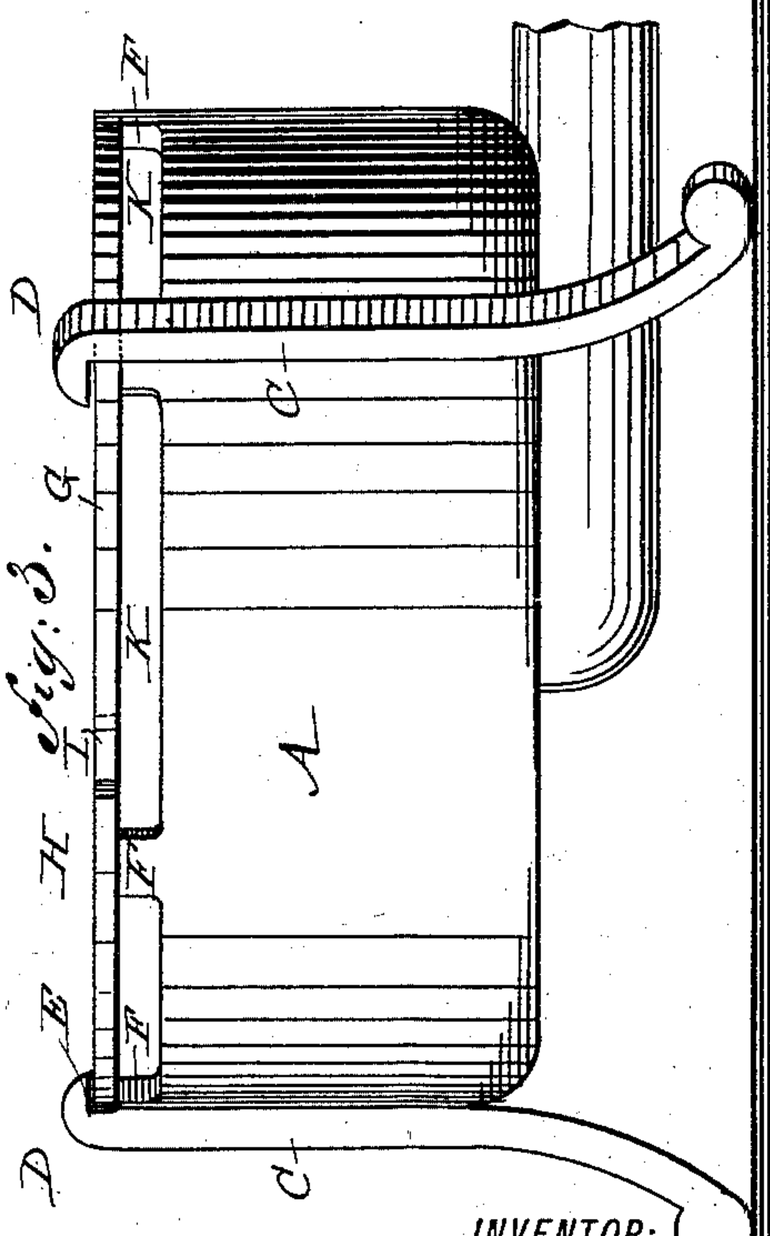

Fig: 3.

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UNITED STATES PATENT OFFICE.

WILLIAM C. BUCKLIN, OF NEW YORK, N. Y.

GAS-STOVE.

SPECIFICATION forming part of Letters Patent No. 427,666, dated May 13, 1890.

Application filed April 19, 1889. Serial No. 307,685. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM C. BUCKLIN, a citizen of the United States, residing in the city, county, and State of New York, have invented a new and useful Improvement in Gas-Stoves, of which the following is a specification.

This invention relates to gas-stoves in the use of which air is mixed with the gas in highly combustible but non-explosive proportions before ignition at the burner; and the invention comprises various novel combinations of parts and features of construction and arrangement whereby, principally, the stove may be easily used interchangeably with a single or a multiple jet burner, an extra supply of air is added to the mixture of gas and air produced at the valved induction-jet, and a further supply of air is first heated by the flame and then fed automatically to the middle of the hollow flame produced by the multiple jet, so as to render the combustion perfect; "fly-back" or explosion of the gas and air mixture at the induction-jet when the gas and air are first admitted or nearly turned off is prevented; the gas and air can be turned on or off instantaneously, and when one is cut off the other will always be cut off; and, further, provision is made in a simple manner for regulating the induction gas-jet without interfering with the simultaneous action of the gas and the air cut-offs.

In order that my invention may be fully understood, I will first describe in detail the manner in which the same may be carried into effect, and then point out its distinctive features in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view, partly in section, of a gas-stove embodying my invention. Fig. 2 is a longitudinal sectional view of the said gas-stove, taken on the broken line X X, Fig. 1. Fig. 3 is a side elevation of the body of the same. Figs. 4, 5, and 6 are detail views of parts of the gas and air regulator of the same, hereinafter referred to. Fig. 7 is a view in vertical section of a modified form of gas and air regulator.

Similar letters of reference designate corresponding parts in the various figures of the drawings.

The gas-stove thus illustrated is formed with a cup-shaped body or chamber A, up centrally through the bottom of which leads a gas and air supply pipe B, which extends backward laterally beneath and is formed integrally with the bottom of the cup. The chamber or cup A is also formed with supporting-legs C, the upper ends of which are extended above the upper edge of the cup A to form supports D for the vessel or utensil to be heated, and equidistant shoulders E projecting inward over the upper edge of the cup. On the said upper edge are formed upright lugs F, on which is adapted to rest an annular flange G, projecting outward from a multiple-jet burner H, and in said flange are formed laterally-opening slots I, corresponding to the shoulders E, so that on bringing the slots I to register with the shoulders E the burner H can be raised and removed from the cup A, leaving only the single jet formed by the upturned end of the supply-pipe B, or by turning the burner-flange G on the supporting-lugs F and beneath the shoulders, so as to bring the slots I and shoulder E out of register, the multiple burner H can be locked securely in place. The burner-flange G is so elevated by the lugs F as to leave an interrupted annular air-opening K between the flange G and the upper edge of the cup A, and the body of the burner H is smaller than the interior of the cup A, and is formed with an annular partition L, depending to within a short distance of the bottom of the cup, so that the jet of mixed air and gas issuing from the upturned end of the supply-pipe B will be drawn upward by the flame, and with it an extra supply of air, which enters through the lateral opening K and passes downward through the annular space between the cup-wall and the partition L, and the extra air will become thoroughly mixed with the previous mixture before passing upward through the perforated top or head of the burner. The mixture of air and gas, which is generally incompletely made at the valved induction-nozzle, is thus rendered complete and more perfect combustion obtained.

The top or head of the burner H is formed

with concentric annular series of jet-perforations M M′, interrupted by a number of radial horizontal air-tubes integral with the burner H, the outer ends of which tubes are open and receive air through the lateral opening K below the burner-flange G, and the inner ends of which open through the wall of a depressed chamber or sink O, formed integrally at the center of the burner-head, so that an ample supply of air will be fed automatically to the center of the ring of flame formed by the annular series of jets, and the said flame is thus prevented from unduly converging, while its combustion is perfected. The parts of the burner-head between the respective air-tubes N slope downward and outward below the level of the tops of said tubes, and are formed with additional radial rows of jet-perforations M^2 on opposite sides of and close to each tube, so that the air passing therethrough will be heated by the said jets before it enters the center of the flame, and thus greatly increase the heating power of the flame.

The air and gas regulator P, which is here shown applied to the outer end of the supply-pipe B, is provided with a mixing-box Q, the tapering mouth of which is connected to the supply-pipe B, and the back Q^2 of which is formed with a central hole R and a number of segmental air-openings S on opposite sides thereof. From the central hole R extends inward an integral sleeve R′, which is formed with a lateral gas-inlet R^2, connected by a lateral tube R^3 with a gas pipe connection R^4, and in the fixed sleeve R′ is fitted to turn a tubular cock S′, having a washer S^2 and nut S^3 screwed on its inner end and bearing against the inner end of the sleeve R to hold the cock against longitudinal movement, while allowing it to be turned.

On the cock S′ outside the box Q is fixed or formed a handle S^4 for turning it and segmental wing-valves S^5, adapted to cover or open the air-openings S, according as the cock is turned. The bore T of the cock S′ tapers conically and terminates in a fine nozzle T′ at its forward end and opens laterally through the side of the cock by a transversely-elliptical opening T^2, which is adapted to register with the gas-inlet R^2 in the sleeve R′.

The adjustment and arrangement of the wing-valves S^5, air-openings S, and the gas-openings R^2 and T^2 in the sleeve R′ and cock S′ with respect to each other are such that the gas-openings R^2 and T^2 will come into register and a jet of gas thus be admitted into the mixing-chamber just before the air-inlets S are uncovered by the air-valve, so that when the air-inlets open and the air is drawn inward by induction the initial admission of gas will have been sufficient to render the mixture non-explosive, and thus prevent fly-back when ignited at the burner-head. In turning the cock in the opposite direction to shut off the air and gas supply conversely the gas-inlet will not be closed until just after the air-supply is shut off, so that the proportion of gas necessary to keep the mixture non-explosive will be supplied up to the point of complete cut-off, and thus fly-back again prevented. The transversely-elliptical shape of the gas-opening T^2 in the cock gives the gas the required admission before the air and prolongs the gas admission after the air.

The rear part of the bore of the barrel S′ is threaded to receive a screw-plug U, provided with a nut U′, or it may be a cross-slot for turning it by an appropriate tool, and on the front end of the plug U is formed a needle-valve U^2, which is much smaller than the bore of the cock S′, so as to leave free communication between the lateral cock-opening T^2 and the nozzle T′.

The front end of the needle-valve U^2 is made conical to adapt it to the opening in the nozzle T′, so that by turning the plug U the needle-valve can be adjusted to regulate the jet of gas issuing from the nozzle T′ with respect to the flow of air through the openings S without in the least disturbing the relations of the gas-cock S′ and air-valves S^5.

In the alternative form of my improved gas and air regulator shown in Fig. 7 the gas-inlet r^2 is parallel to the supply-pipe *b*, the cock *s′* crosses the gas-inlet, and hence has a transverse oblong gas-opening s^2, the wing-valves s^5 are on the bottom of the mixing-box *q*, while the cock-handle s^4 is above the same, and the needle-valve for adjusting the gas-jet is omitted.

I claim as new and desire to secure by Letters Patent—

1. In a gas-stove, the combination, with a cup-shaped burner-body having upright lugs on its upper edge, of a detachable perforated burner-head resting on the said lugs, so as to leave an interrupted lateral air-opening, an annular partition depending from the burner-head within the chamber, and a gas-supply pipe leading upward within the said partition, substantially as described.

2. In a gas-stove, the combination, with a cup-shaped burner-body having extensions projecting upward and then inward to form shoulders over its upper edge, of a burner-head having a peripheral flange resting on the upper edge of the cup and formed with lateral slots adapted to receive the shoulders of the said extensions, substantially as described.

3. A gas-stove constructed with a cup-shaped chamber having a burner-head formed with a hollow jet or series of jets, lateral air-inlets in the wall and near the top of said chamber, an annular partition depending from the head within the lateral air-inlets, air-openings in the head within the hollow jet, air-tubes extending laterally from said central air-openings through the said partition, and a gas-supply pipe discharging upward within the said partition, substantially as described.

4. A gas-burner the head of which is

formed with a hollow jet or series of jets, and lateral air-tubes interrupting said jet or jets and leading from outside to within the hollow jet or series of jets, parts of the said head being depressed below the level of the air-tubes and provided with jets alongside the same, as and for the purpose specified.

5. The detachable multiple-jet burner herein described, consisting of a head formed with a ring-shaped jet or series of jets and a central sink or chamber within the same, an annular partition depending from the head outside the jet or jets, and tubes extending from the central sink or chamber radially outward through the annular partition, as herein set forth.

6. In a gas-burner, a gas and air regulator provided with a mixing-chamber having separate air and gas inlets, an induction-nozzle connected with the gas-inlet and opening within the mixing-chamber considerably in advance of the air-inlet, a rotary and longitudinally-immovable gas-cock in the connection between the gas-inlet and the gas-induction nozzle, and a valve on the gas-cock turning over the outside of the air-inlet, substantially as described.

7. In a gas-burner, a gas and air regulator provided with a mixing-chamber having a gas-inlet in one wall and an air-inlet in another wall, an induction-nozzle connected with the gas-inlet and opening within the mixing-chamber in advance of the air-inlet, a gas-cock mounted to turn but immovable lengthwise in the connection of the gas-inlet and nozzle, and a wing-valve fixed on said gas-cock and adapted to turn over the said air-inlet, substantially as described.

8. In a gas and air regulator, the combination, with a mixing-chamber having separate gas and air inlets, an induction-nozzle connected with the gas-inlet and opening within the chamber, and a gas-cock interposed in the gas-inlet and nozzle connection, and an air-valve fixed on the cock and turning therewith over the air-inlet, the gas-port in the said cock being transversely wider than the gas-inlet and so adjusted with respect to the said air-valve as not to reduce the gas-inlet until the air-valve is fully closed, substantially as herein described.

9. In a gas and air regulator, the combination, with a mixing-box having gas and air inlets, of a rotary gas-cock the barrel of which is bored longitudinally to form an induction-nozzle opening into the mixing-box, which nozzle is adapted to connect with the gas-inlet and tapers forward, and a plug adjustable lengthwise in the bore of the barrel and carrying a needle-valve adapted to the induction end of the nozzle, substantially as described.

10. In a gas and air regulator, the combination, with a mixing-box having a fixed sleeve extending inward from an opening in its wall, and formed also with air and gas openings in its wall, the said gas-opening being extended by a tube through the said sleeve, of a cock mounted to turn without lengthwise movement in the sleeve and having a gas-opening to register with that in the sleeve, and a rotary valve fixed on the barrel outside the box to turn over the air-inlet opening, substantially as described.

11. In a gas and air regulator, the combination, with a mixing-chamber having separate gas and air inlets, an induction-nozzle connected with the gas-inlet and opening within the mixing-chamber, a gas-cock between the gas-inlet and nozzle, and an air-valve fixed on and turning with the gas-cock and so adjusted with respect thereto as to close the air-inlet before the gas-inlet is fully closed and not to open the air-inlet until after the gas-inlet is partially opened, as and for the purposes specified.

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