

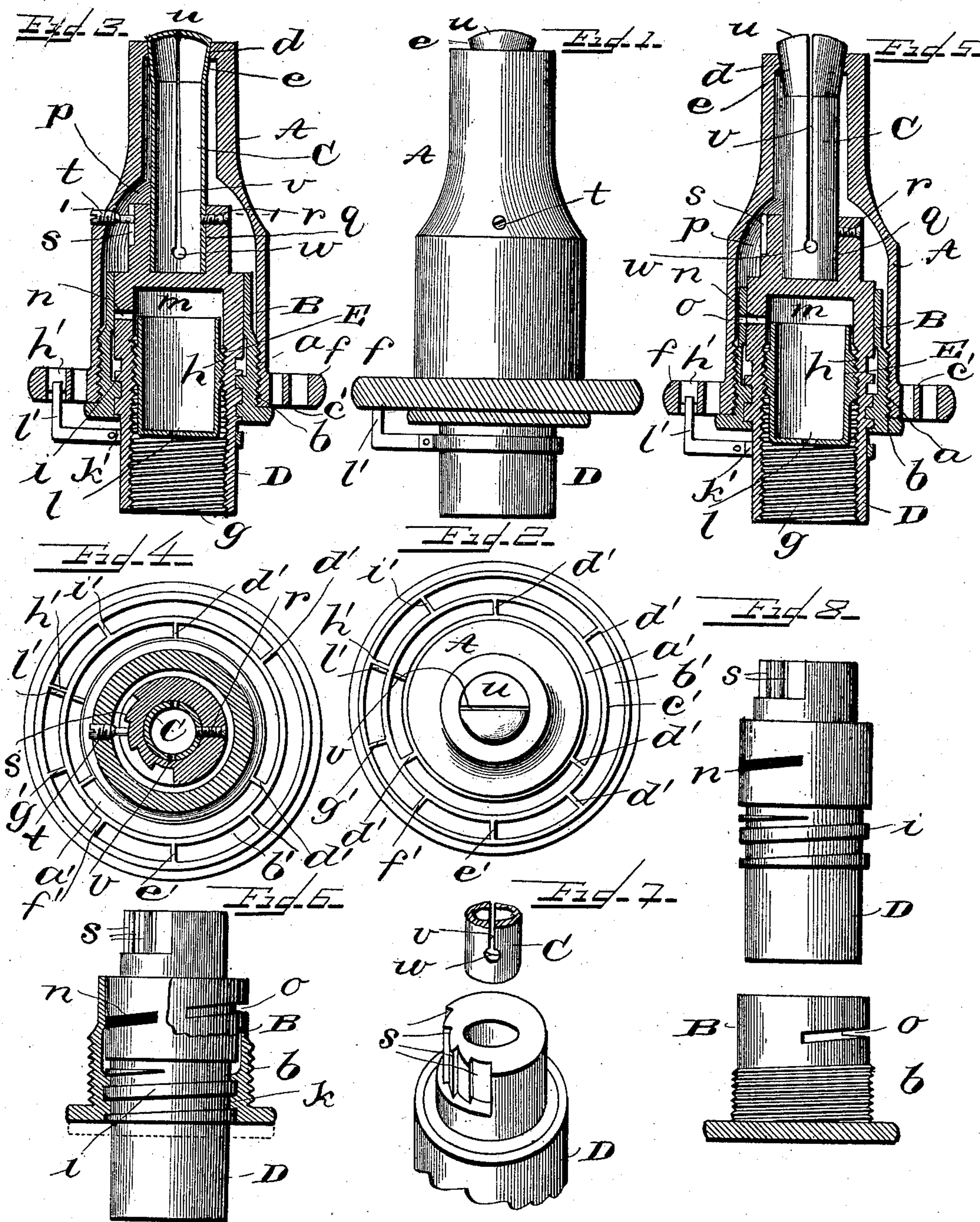
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Patented Dec. 27, 1898.

C. F. CATTELL.
GAS BURNER.

(Application filed Dec. 11, 1897.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

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GAS-BURNER.

SPECIFICATION forming part of Letters Patent No. 616,453, dated December 27, 1898.

Application filed December 11, 1897. Serial No. 661,536. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. CATTELL, a citizen of the United States, residing at Darby, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Gas-Burners; and I do 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 appertains to make and use the same.

My invention relates to gas-burners, and has for its object improvements in construction whereby gas of different quality may be burned, a superior light produced, and proper shape given to the flame without blowing or producing smoke, which will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a side elevation of my improved burner; Fig. 2, a top plan view; Fig. 3, a vertical section showing the port between the inner and outer gas-chambers closed; Fig. 4, a transverse section on the line 1 1, Fig. 3; Fig. 5, a vertical section showing the port between the inner and outer chambers open; Fig. 6, a side elevation, partly in section, showing the sleeve or cut-off and the inner fixed cylinder detached; Fig. 7, a detail perspective showing the upper part of the fixed cylinder and the lower part of the tip; and Fig. 8, a side elevation showing the sleeve or cut-off and the fixed cylinder above and separated therefrom.

Reference being had to the drawings and the letters thereon, A indicates the outer casing or shell, which is axially and vertically movable upon the cut-off or sleeve B, to which it is connected by an internal screw-thread *a*, which engages an external screw-thread *b* on said sleeve, and is provided at its upper and contracted end *c* with a tapering seat *d*, which engages a corresponding tapered portion *e* of the gas-tip C, and at its lower end with a concentric ring *f*, which serves as a handle to regulate the flame issuing from the tip.

D indicates the inner and fixed cylinder, which is provided with an internal screw-thread *g*, by which it is attached to a gas-fixture and which is engaged by the external thread *h* on the adjustable thimble or pres-

sure-regulator E, and with a coarse external screw-thread *i*, which is engaged by the internal screw-thread *k* on the cut-off B, so that the casing or shell A, the cut-off or sleeve B, and the pressure-regulator E are all supported by the cylinder D.

The thimble or pressure-regulator E is provided with an aperture *l* in the bottom, through which gas enters the chamber *m* in the cylinder D, and the gas is discharged from said chamber through a diagonal slot *n* in the wall of the chamber, and the quantity of gas discharged is regulated by the cut-off B, which is provided with a slot *o*, corresponding and registering with the slot *n*. The gas flows from the chamber *m*, through slots *n* and *o*, into chamber *p*, within the casing A.

In the upper end or extension of the cylinder D is a socket *q*, in which the lower end of the gas-tip C rests and is secured therein by means of a set-screw *r*, and on the outer surface of the extension are a series of notches *s*, with which a screw *t*, extending through the casing A, engages to secure the gas-tip C in its relation to the casing A after the latter has been adjusted to produce the desired flame issuing from the tip.

The gas-tip is provided with a head *u* and with a longitudinal slot *v*, at the lower end of which slot is a circular opening *w*, which extends through both sides of the tip and, in conjunction with the slot *v*, renders the tip contractible and expansible to regulate the thickness of the flame, which is supplied with gas from the chamber *p*, entering the tip through the slot *v*.

The casing A is revolved axially by means of the ring *f* at the lower end of the casing, and the ring is provided with concentric openings *a' b'*, which are separated by an annular web *c'*, and in said concentric openings are transverse bars *d'*, which connect the web *c'* to the casing and the outer rim of ring *f* and with bars *e', f', g', h', and i'*, which serve the same general purpose as the bars *d'*, but also serve a further purpose, as will hereinafter appear. To the lower end of the cylinder D is attached a collar *k'*, which is provided with an upwardly-extending flexible arm *l'*, which enters one of the concentric openings in the ring *f*, and as the casing is turned axi-

ally to open or close the slot *v* in the gas-tip C the arm *l'* engages the bars *e'*, *f'*, *g'*, *h'*, and *i'* and by its flexibility passes under the bars as the casing is rotated, and the position of the arm *l'* indicates the amount of gas being burned per hour.

When the burner is closed, the arm *l'* rests against the bar *e'* on the side adjacent to the bar *f'*, and when the burner is opened by turning the casing until the bar *f'* engages the arm *l'*, the consumption of gas will be two feet per hour, and to increase the candle-power of the burner the casing is turned farther, the arm *l'* springing under the bar *f'*, and when the arm comes in contact with the bar *g'* a four-foot burner will have been produced, and so on until the maximum capacity of the burner shall have been reached. Then it will be observed that the position of the arm *l'* in the ring indicates the amount of gas being consumed by the burner per hour.

By the adjustment of the burner gas of different qualities may be burned, rich gas requiring the slot *v* in the gas-tip C to be opened but slightly, while poor gas requires the slot to be opened to a greater extent to increase the thickness of the flame.

By adjusting the thimble E the pressure of the gas is regulated by increasing or diminishing the capacity of the gas-chamber *m*, and the amount of gas supplied to the burner-tip is regulated by the cut-off B and its port or slot *o* and the slot *n* in the wall of said chamber or in the cylinder D.

The resiliency of the slotted gas-tip C causes the slot to close automatically as the casing A is rotated to shut off the flow of gas.

Having thus fully described my invention, what I claim is—

1. In a gas-burner, the combination of an

outer rotatable and vertically-movable casing a rotatable cut-off, within the casing and a contractible gas-tip.

2. In a gas-burner the combination of an outer rotatable casing and a rotatable cut-off, a pressure-regulator and a tip within said casing.

3. In a gas-burner the combination of an outer rotatable casing, a rotatable cut-off engaging the casing, an inner fixed cylinder, provided with a gas-port controlled by said cut-off and a contractible gas-tip operated by said casing.

4. In a gas-burner, the combination of an outer rotatable casing provided with an internal screw-thread, a rotatable cut-off provided with an external and an internal thread, a non-rotatable cylinder having an external screw-thread and a gas-tip supported by said cylinder.

5. In a gas-burner, the combination of an outer rotatable casing, a rotatable cut-off, a non-rotatable cylinder supporting said casing and cut-off, means for securing the casing to the cylinder to prevent rotation and a contractible gas-tip within said casing.

6. In a gas-burner, the combination of an outer rotatable casing provided with a ring having an annular opening thereon and bars crossing said opening, a non-rotatable cylinder supporting the casing and having an arm attached thereto to enter said annular opening and a gas-tip.

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

CHARLES F. CATTELL.

Witnesses:

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J. B. FLOUNDERS.