(No Model.) 2 Sheets—Sheet 1.

H. A. PINKHAM.

ELECTRIC GAS LIGHTER.

No. 458,486. Patented Aug. 25, 1891.

Fig. 6.

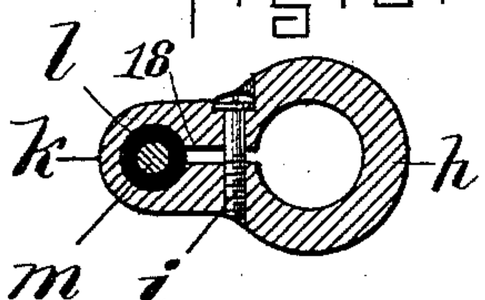


Fig. 7.

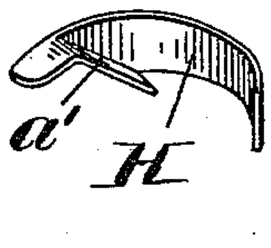
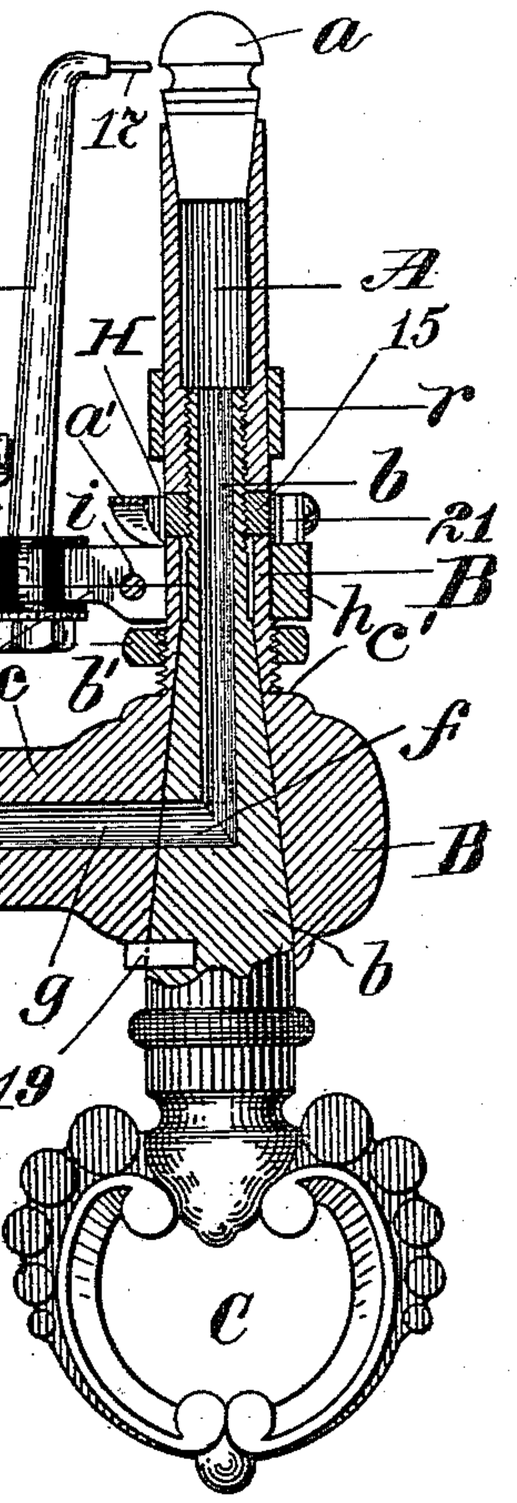


Fig. 2.



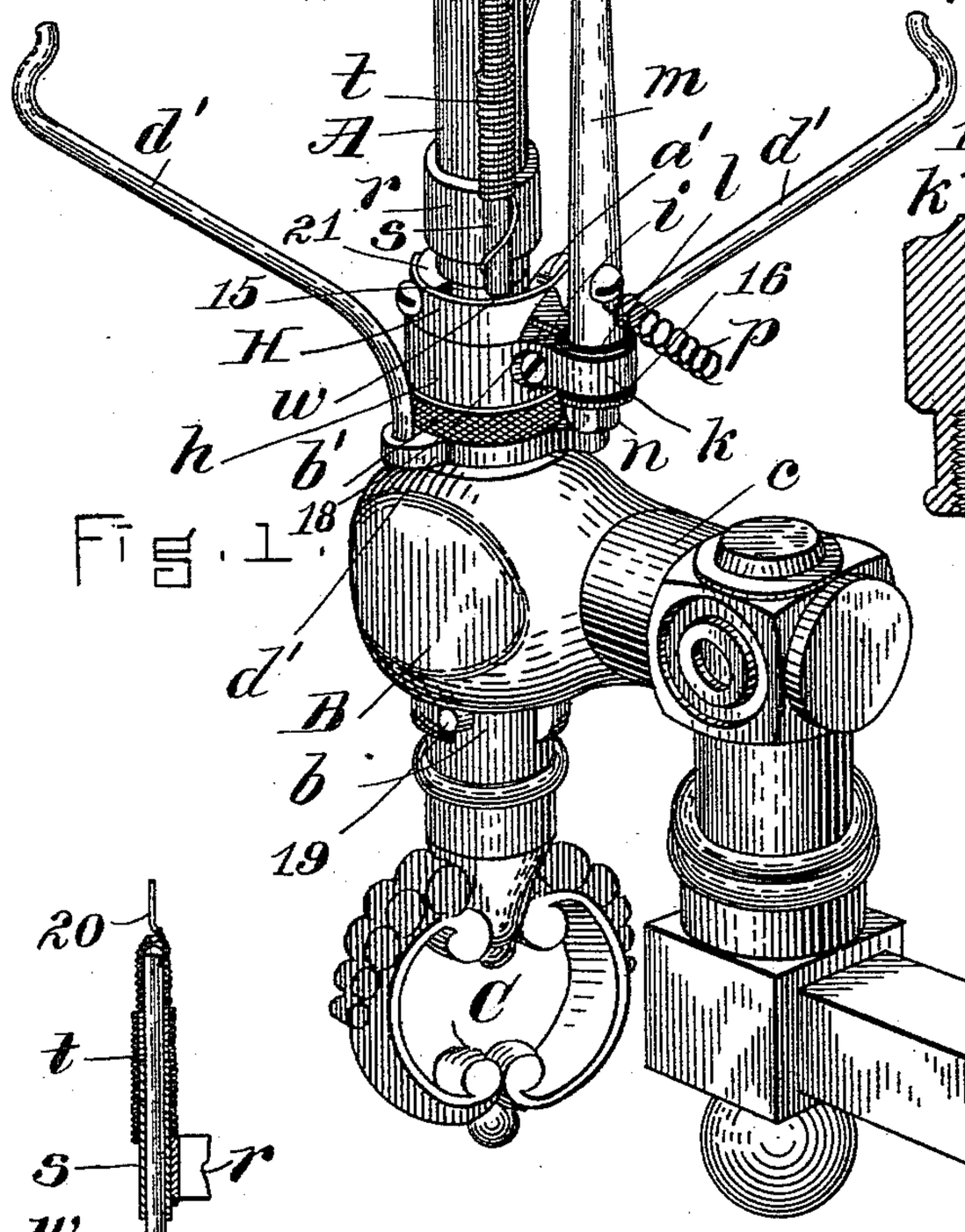


Fig. 1.

Fig. 10.

Fig. 9.

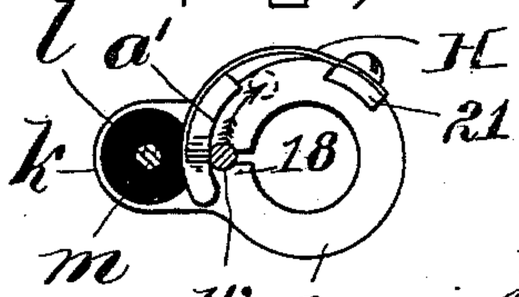
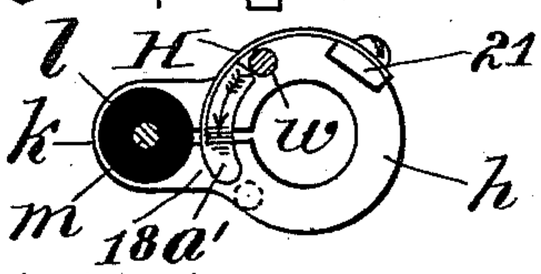


Fig. 8.



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(No Model.) 2 Sheets—Sheet 2.

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ELECTRIC GAS LIGHTER.

No. 458,486. Patented Aug. 25, 1891.

Fig. 3.

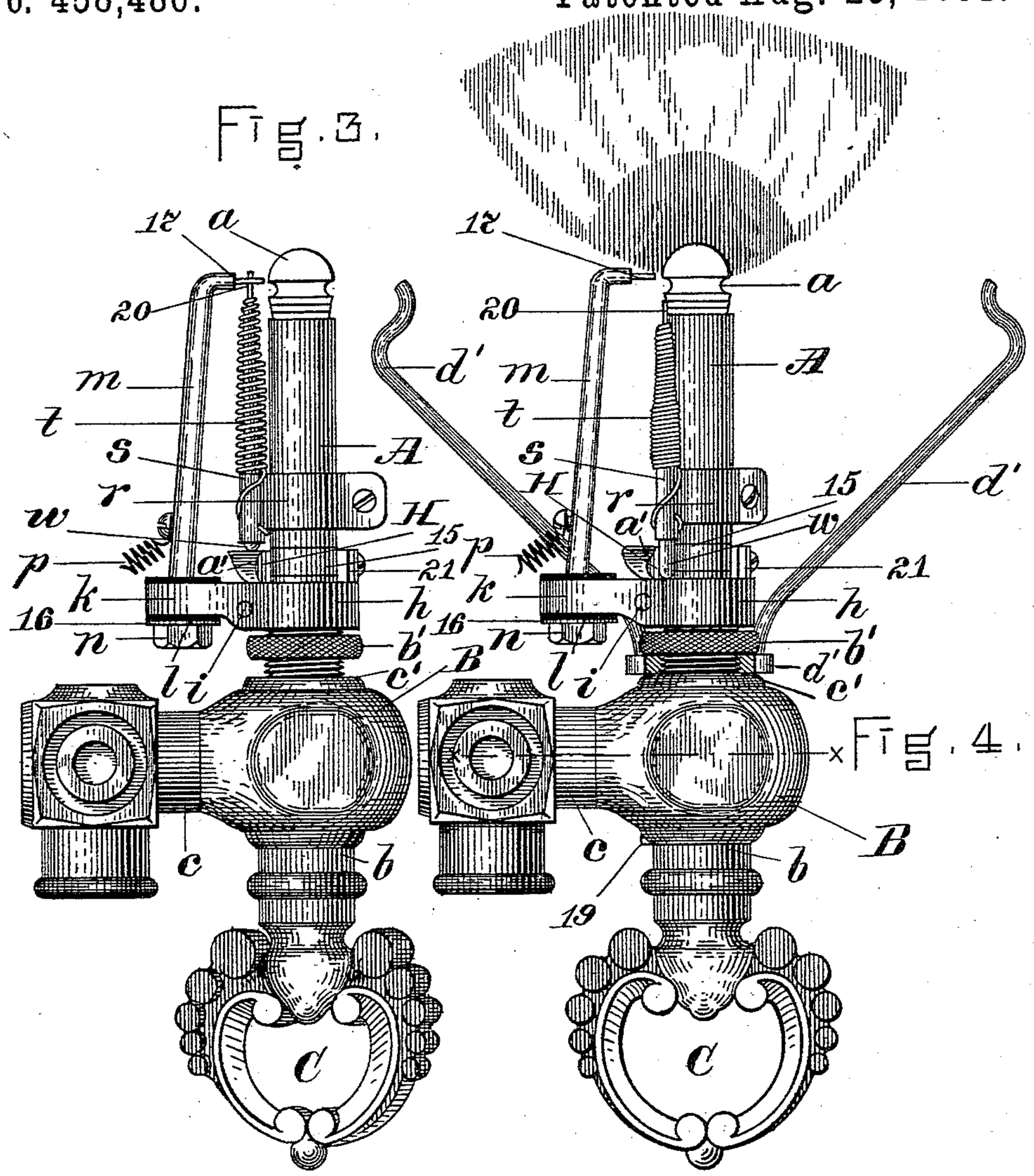
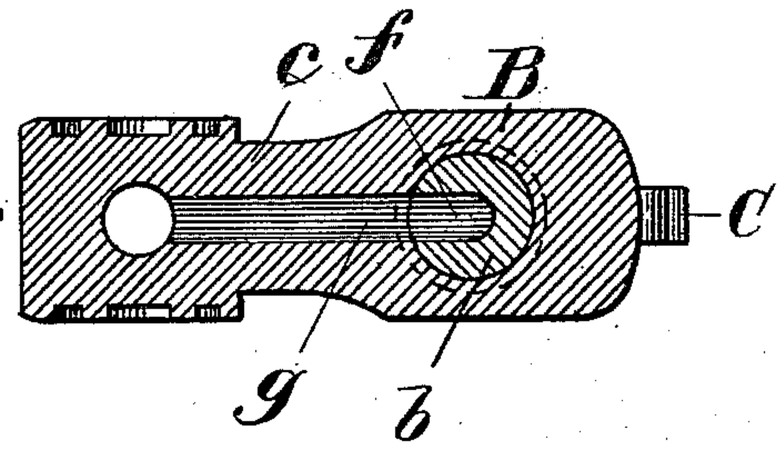


Fig. 4.

Fig. 5.



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ELECTRIC GAS-LIGHTER.

SPECIFICATION forming part of Letters Patent No. 458,486, dated August 25, 1891.

Application filed October 25, 1890. Serial No. 369,335. (No model.)

To all whom it may concern:

Be it known that I, HORACE A. PINKHAM, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain Improvements in Electric Gas-Lighting Burners, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is an enlarged perspective view of an electric gas-lighting burner constructed in accordance with my invention, the stop-cock being closed. Fig. 2 is a vertical section through the center of the same. Fig. 3 is a side elevation of the same, the electrodes being represented in contact with each other. Fig. 4 is a side elevation of the same with the stop-cock open. Fig. 5 is a horizontal section on the line *x x* of Fig. 4; Figs 6, 7, 8, and 9, details to be referred to. Fig. 10 is a vertical section of the movable electrode.

My invention relates to electric gas-lighting burners in which the gas is alternately let on and shut off by turning a gas-cock having connected therewith suitable mechanism for simultaneously producing an electric spark to ignite the gas by causing the terminal of a movable electrode to be wiped past or swept into and out of contact with the terminal of a fixed electrode situated in close proximity to the orifice at the tip of the burner; and my invention consists in the combination, with a gas-burner having its straight pillar or vertical outside portion, which carries the tip formed by the prolongation or upward extension of the plug of the stop-cock, arranged vertically within the shell and provided with a thumb piece or handle, whereby it may be turned with the pillar or upright portion of the burner to let on or shut off the gas, of certain novel mechanism for actuating the movable electrode, which is attached to the pillar or vertical portion of the burner, whereby when the key or handle of the stop-cock is turned to let on the gas the said movable electrode is wiped or swept into and out of contact with the fixed electrode to produce the spark to ignite the gas, said mechanism being so constructed as to cause the elastic terminal of the movable electrode to be first raised above the level of the terminal of the fixed electrode and then wiped past the same to produce the spark and dropped to its original level below the fixed electrode and out of the way of the flame, so that when the stop-cock is turned in the opposite direction to shut off the gas the movable electrode will be carried past the fixed electrode to its original position without coming into contact therewith, as hereinafter more particularly set forth.

In the said drawings, A represents the hollow pillar or main vertical portion of the gas-burner, which is provided, as usual, with a tip *a*, and forms a prolongation or upward extension of the tapering plug *b* of the stop-cock, which is arranged vertically within the shell B, on one side of which is the supply-pipe *c*. The pillar A is screwed onto the upper threaded end of the plug *b*, as seen in Fig. 2, and a check-nut 15, also placed upon said threaded end, is interposed between the bottom of the pillar A and the upper end of the shell B, resting upon the latter and serving to hold the tapering plug *b* firmly up within its seat, thus preventing leakage, the pillar A being screwed down firmly upon said nut to lock it securely in place when adjusted. The stem of the plug *b* extends down below the shell B, and has formed upon its lower end, or attached thereto in any suitable manner, a thumb-piece or handle C, by which it can be turned by the hand to let on or shut off the gas, a suitable stop-pin 19 being provided, as usual, to limit the movement of the plug in either direction. The plug *b* is made hollow, and communicates with the straight longitudinal passage through the pillar or vertical portion A of the burner, and in the side of the plug is formed an aperture *f*, which communicates with its interior, and is so placed that by turning the plug it can be brought into or out of line with the gas-inlet passage *g* to admit the gas to the portion A or shut it off therefrom, as required.

Around the upper portion of the shell B is fitted a heavy collar *h*, which is clamped tightly in place by a screw *i*, said collar having on one side an enlargement or projecting portion *k*, provided with a vertical aperture, within which is placed a sleeve or bushing *l*,

composed of hard rubber or other suitable insulating substance, for the reception of the lower end of the fixed electrode *m*, which is secured in place by a nut *n* and washer 16. The upper end 17 of this electrode, which is bent at a right angle, as shown, extends up to a point in close proximity with the orifice at the tip of the burner, and said electrode is connected, as usual, with one pole of the battery by a wire *p*. The collar *h* is made in a single piece without being slit or cut through to the outside at any point, and after the larger and smaller apertures therein have been smoothed or bored out the solid portion 18 between them is sawed or cut through, whereby sufficient spring or elasticity is afforded to enable the collar to be tightly clamped in place by means of the screw *i*, and the necessity of cutting the collar through to the outside is thus avoided and a neater finish thereby secured.

To the vertical portion or pillar A, which, as before stated, is turned or rotated with the stop-cock by means of its key or handle C, is clamped above the collar *h*, a collar *r*, which carries on one side a vertical guide tube or sleeve *s*, extending up alongside of the pillar A. Around this sleeve is coiled a light spiral spring *t*, which forms the upper portion of the movable electrode, and is connected through the burner and the gas-pipe with the other pole of the battery. The lower end of this spring *t* is secured to the collar *r*, or bottom of the tube *s*, and the upper portion, which is of slightly-reduced diameter and of conical form at the top, extends some distance above the top of the sleeve *s*, its terminal consisting of a straight vertical piece of wire 20, the elasticity of which permits it to be wiped or swept past the rigid terminal 17 of the fixed electrode, thus producing a spark to ignite the gas.

Within the sleeve *s* is placed a vertically-sliding pin or rod *w*, the upper portion of which extends up into the upper portion of the spring *t* as far as permitted by its closed conical end. The bottom of this pin *w* extends down below the sleeve *s* and close to the top of the collar *h*, and when the parts are in their normal position with the gas shut off, as seen in Fig. 1, this pin lies on the inner side of a curved spring cam-plate H, secured to a lug 21, projecting up from the collar *h* and partially encircling the pillar A. At the free end of the spring cam-plate H, on the inner side, is an inclined flange or cam *a'*, arranged in the path traveled by the rod *w* when swung around by the movement of the pillar A, whereby as the latter is turned to let on the gas the lower end of the rod *w* is caused to travel in contact with the said cam or incline, which forces the said rod up through its sleeve *s*, producing an upward movement of the spring *t*, forming the upper portion of the movable electrode, the terminal 20 of which is thereby raised above the level of the horizontal terminal of the fixed electrode, as seen in Fig. 3. As the vertical portion A of the burner continues to be rotated with the stop-cock, the elastic terminal 20 is brought into contact with the terminal 17 of the fixed electrode, as seen in Fig. 3, and wiped past the same, thus producing the spark to ignite the gas, the cock being open to let on the gas when the parts are in this position. The separation of the terminals 17 20 may take place just before or at the time of the vertical descent of the spring *t*, which occurs as soon as the end of the rod *w* is carried past and drops off the end or highest point of the cam *a'*, the resiliency of the spring *t* carrying the rod *w* back to its lowest level, as seen in Fig. 4, in which position the terminal 20 will be entirely out of the way of the flame, as is necessary to prevent it from being injured thereby, and when the stop-cock is rotated in the opposite direction to shut off the gas the lower end of the rod *w* is carried around against the inner side of the free end of the spring-plate H, as seen in Fig. 9, forcing it outward until it reaches the inner end of the said cam or incline *a'*, when the latter springs or snaps past the end of the rod into a position, as seen in Fig. 8, to again intercept its path. The gas being then shut off and the parts being in a position to be again operated, as before described, when the gas is to be lighted and during the return movement of the movable electrode, it will be seen that it lies below the level of the fixed electrode, thus effectually preventing any contact between the two while the gas is being shut off, no spark being required at that time. The upper portion of the shell B beneath the collar *h* is provided with a screw-thread, on which turns a nut *b'*, between which and the shoulder *c'* is clamped the shade-holder *d'*, which is thus clamped securely in place, as desired.

An electric gas-lighting burner constructed as above described is not liable to get out of order, and is much safer than those in which the gas-cock is operated by pulling down a pendent cord or chain, for the reason that the position of the key or handle will always indicate whether the gas is let on or shut off, which is not the case with the class of burners known as "pendent burners." Hence there is no liability of the parts being left in a position to allow the gas to escape. Furthermore, there is no liability of the electrodes being left in contact with each other, as the turning of the gas-cock to let on the gas is sure to separate them, while no contact is made on the return movement of the gas-cock to shut off the gas.

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

1. In an electric gas-lighting burner, the combination, with the plug of the stop-cock arranged vertically within the shell and provided with a thumb-piece or handle and the pillar or vertical portion A, forming a prolongation or upward extension of the said

plug, of a fixed electrode and a movable electrode consisting of a sliding pin or rod having a suitable terminal, a sleeve encircling and forming a guide for said sliding pin or rod, said guide being attached to and adapted to be rotated with the portion A, a cam or incline for raising said rod as its lower end is caused to travel in contact therewith by the rotation of the said portion A to carry its terminal above the level of the terminal of the fixed electrode, and a spring for retracting the rod after it has passed off the end of the cam, substantially as set forth.

2. In an electric gas-lighting burner, the combination, with the plug of the stop-cock arranged vertically within the shell and provided with a thumb-piece or handle, the rotating vertical pillar or portion A, forming a prolongation of the said plug, and a fixed electrode, of the sleeve or guide *s*, attached to and moving with said portion A, the rod *w*, sliding vertically within said guide, the spring H, with its inclined cam or flange *a'*, for raising the rod *w* as it is rotated with the portion A, and the spiral spring *t*, encircling the sleeve and the upper portion of the rod *w* and serving to retract the latter after it has passed off the end of the cam, said spring having an upwardly-projecting end 20, forming the elastic terminal of the movable electrode, substantially as set forth.

3. In an electric gas-lighting burner of the character described, the rotating pillar or portion A, a cam or incline, a guide or sleeve attached to the rotating pillar or portion A, and a movable electrode consisting of a rod or pin sliding vertically in said guide or sleeve and adapted to be forced upward by the said cam or incline as said portion A is turned in letting on the gas, combined with a spiral spring, the upper projecting end of which forms the elastic or yielding terminal of said movable electrode, said spring encircling the upper portion of the sliding rod and being expanded in the direction of its length by the said rod as it is forced upward to carry its terminal above the level of the terminal of the fixed electrode and serving on the release of the rod to return the same to its normal position and simultaneously withdraw its elastic terminal below the level of the terminal of the fixed electrode, substantially as set forth.

4. In an electric gas-lighting burner, the combination, with the shell B and the straight vertical pillar or portion A, of the collar *h*, adapted to fit over the said shell and provided with a projection or enlargement on one side, and the fixed electrode supported on said projection or enlargement, said collar having the solid portion 18 between its larger and smaller apertures cut or slit through from the one to the other, whereby it may be tightened by means of the screw *i* passing through said portion 18, substantially as set forth.

5. In a gas-burner, the combination, with the shell B and the plug *b*, having the vertical portion or pillar A screwed onto its upper threaded end and forming a prolongation or extension thereof, of the check-nut 15, interposed between the bottom of the pillar A and the upper end of the shell B and adapted to hold the plug firmly up within its seat, said pillar A being screwed firmly down upon the nut 15 to lock the same securely in place when adjusted, substantially as set forth.

Witness my hand this 22d day of October, A. D. 1890.

HORACE A. PINKHAM.

In presence of—
P. E. TESCHEMACHER,
HARRY W. AIKEN.