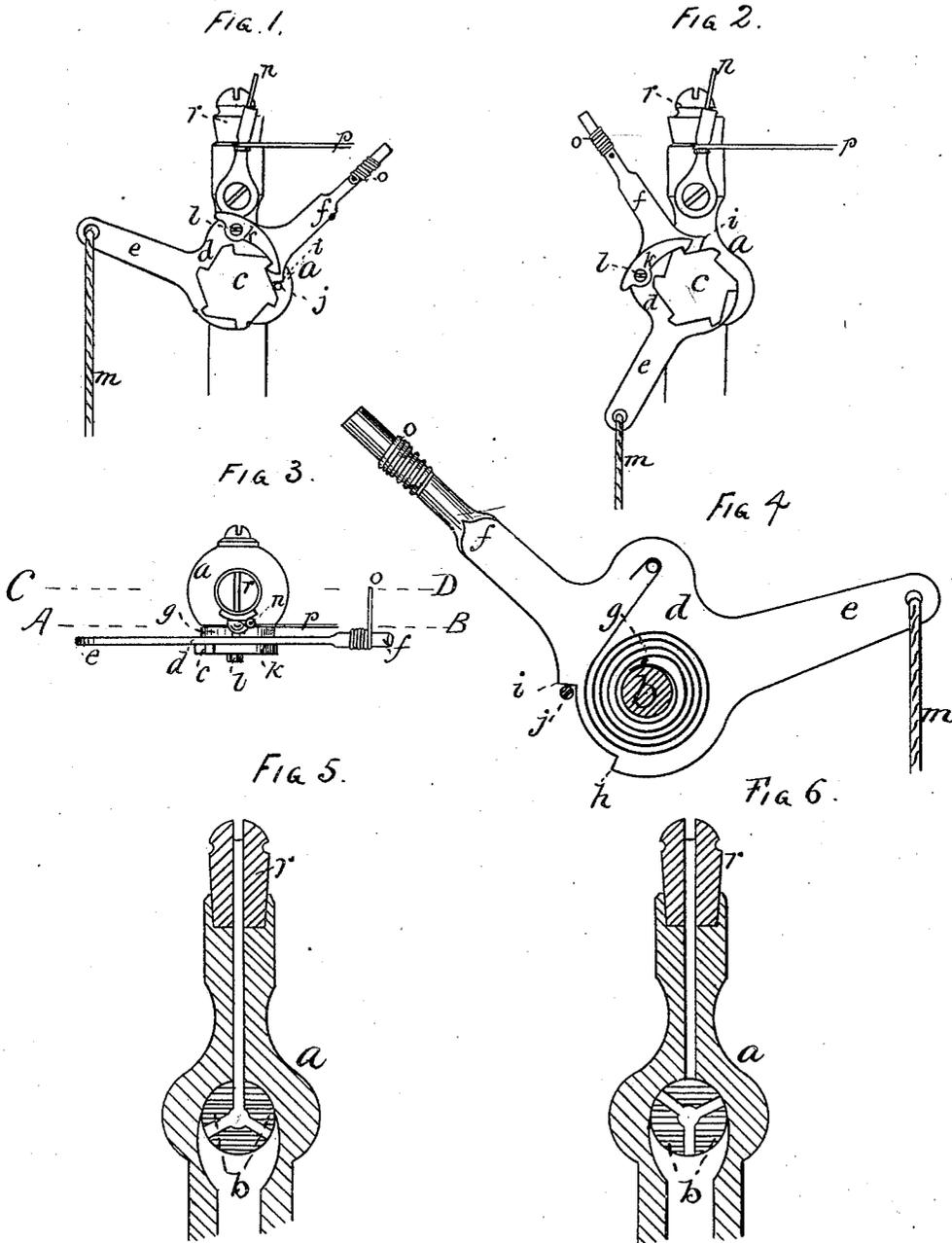


F. V. SANDFORD.
Electric Gas Lighting Apparatus.

No. 232,304.

Patented Sept. 14, 1880.



WITNESSES
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UNITED STATES PATENT OFFICE.

FRANK V. SANDFORD, OF CHELSEA, MASS., ASSIGNOR OF ONE-THIRD OF HIS RIGHT TO JOSEPH W. BARTLETT, OF NEW YORK, N. Y.

ELECTRIC GAS-LIGHTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 232,304, dated September 14, 1880.

Application filed February 6, 1877.

To all whom it may concern :

Be it known that I, FRANK V. SANDFORD, of Chelsea, State of Massachusetts, have invented Improvements in Electric Gas-Lighting Apparatus, of which the following is a specification.

The object of my invention is to facilitate the manipulation of electric gas-lighting apparatus used in the positions and for the purpose of lighting houses, public halls, and other buildings, and in the various fixtures which are employed for such purposes.

The invention consists in a stop-cock provided with a plurality of ways or passages through which the gas may escape from the pipe to the burner, said cock being provided with a ratchet having twice the number of teeth that there are ways in the cock, an angle-lever or rocking bar being pivoted on said cock, and carrying a pawl which engages with said ratchet, and, as said lever is actuated, serving to alternately open and close the gas-passage to the tip, said lever being provided with a returning-spring, a yielding platinum point for contact with a fixed insulated joint, and a chain, cord, or other means for vibrating it on its axis, all as will, by the aid of the accompanying drawings, be fully described.

In said drawings, Figure 1 is a side elevation of a gas-burner provided with my improvements, and showing the rocking lever in position as retained by the returning-spring. Fig. 2 is a similar view, but showing the lever at the extreme limit of movement by the use of the actuating-chain. Fig. 3 is a top or plan view of Fig. 1. Fig. 4 is an enlarged back-side view or elevation of the arm and returning-spring, and showing the cock in section, taken on line A B, Fig. 3. Fig. 5 is an enlarged vertical section taken on line C D, Fig. 3, in the axis of the tip and pipe, and showing a free passage of the gas to the tip. Fig. 6 is an enlarged similar section, but showing the passage to the tip closed.

In these drawings, *a* is the burner, and *b* the stop-cock. *c* is a six-tooth ratchet formed or secured upon the stem of the stop-cock. *d* is the vibrating angle-lever pivoted upon the stem of the cock. *e* is an arm of said lever, to which chain *m* is attached, and *f* is the op-

posite arm, upon which the spring platinum point *o* is secured, as shown. *g* is the returning-spring coiled around the stem of the cock, and secured at its interior extremity to the burner, while its external extremity is secured to a pin in the lever *d*, as shown in Fig. 4. *h* is a stop in lever *d*, which, by its contact with pin *j*, secured in the burner, limits the movement of the lever when actuated by chain *m*, and *i* is a similar stop, which checks the action of the returning-spring *g*. *k* is the pawl pivoted at *l* to lever *d*, and which engages with ratchet *c* and actuates cock *b*. *m* is the chain attached to arm *e*. *n* is the insulated stationary platinum point secured to the burner, and which, in conjunction with point *o*, serves to give off the electric spark which ignites the gas issuing from the tip *r*. *p* is the wire leading from the fixed point *n* to the battery.

The practical operation of my invention is as follows: The lever *d* being in the position shown in Figs. 1, 3, 4, and as held by the returning-spring *g*, let us suppose that the cock is in the position shown in Fig. 6. Therefore, while the gas flowing through the supply-pipe would have free ingress into the lower portion of the axial passage in the burner, yet it would not have free access to the tip, as neither of the three ways shown in the cock would coincide with the upper axial passage leading through the burner *a* to tip *r*. If, then, by a downward movement of chain *m* the lever *d* be vibrated to the position shown in Fig. 2, the cock *b* would, by the action of pawl *k* upon ratchet *c*, be rotated one-sixth of a circle, or sixty degrees, thereby bringing one of the ways therein in coincidence with the axial passage of the burner leading to the tip, as shown in Fig. 5, and as the other two passages would open into the central cavity in the burner below the cock, as shown, a free flow of gas to the tip would be established. Simultaneously with such opening of the gas-passage to the tip the platinum point *o*, by the movement of lever *d*, would be brought in contact with and be brought past the fixed point *n*, thereby generating an electric spark, which would ignite the gas thus set free and issuing from tip *r*. When, by such use of the chain, shoulder *h* is brought in contact with stop *j*,

the chain is released, and the reflex action of spring *g* returns the lever to its normal position, as shown in said Figs. 1, 3, 4.

When the gas is lighted, and it is desired to extinguish it, the same use of the chain and movement of lever *d* accomplishes that result, for it is obvious that if the cock be in the relative position shown in Fig. 5 the described movement of lever *d* will bring it to the position shown in Fig. 6, thereby extinguishing the light by shutting off the flow of gas to the burner. Thus while each movement of the lever will both in its forward and backward movement generate the electric spark, yet each alternate movement will respectively produce and extinguish the gas-light, for the obvious reason that the forward movement of the lever, as produced by drawing upon the chain, will alternately let on and shut off the gas, and that although the electric spark is twice generated at each manipulation of the lever, yet no gas-light is thereby generated, except at each alternate manipulation, for the reason that no gas-supply is produced except alternately, as described.

It will be apparent that by the arrangement

of the spring-point *o* transversely to the line of movement of lever *d* it will pass the fixed point *n* by a sliding or wiping motion, as the rigidity of point *n* serves to bend point *o* into the plane of movement of the lever, and that the coiled portion of point *o* upon the arm *e* serves always to return the point to the position shown in Fig. 3 as soon as it has passed point *n*, and that the spark thereby generated will ignite the gas flowing from the tip, and, besides, should the gas from any cause fail to flow in season to be ignited by the spark generated by the forward movement of the lever, it would be ignited by the spark set free by the return motion.

I claim as my invention—

In electric gas-lighting apparatus, the combination of burner *a*, cock *b*, ratchet *c*, lever *d*, provided with its igniting-wire *o*, pawl *k*, and chain *m*, or its equivalent, substantially as described and shown.

FRANK V. SANDFORD.

Witnesses:

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