

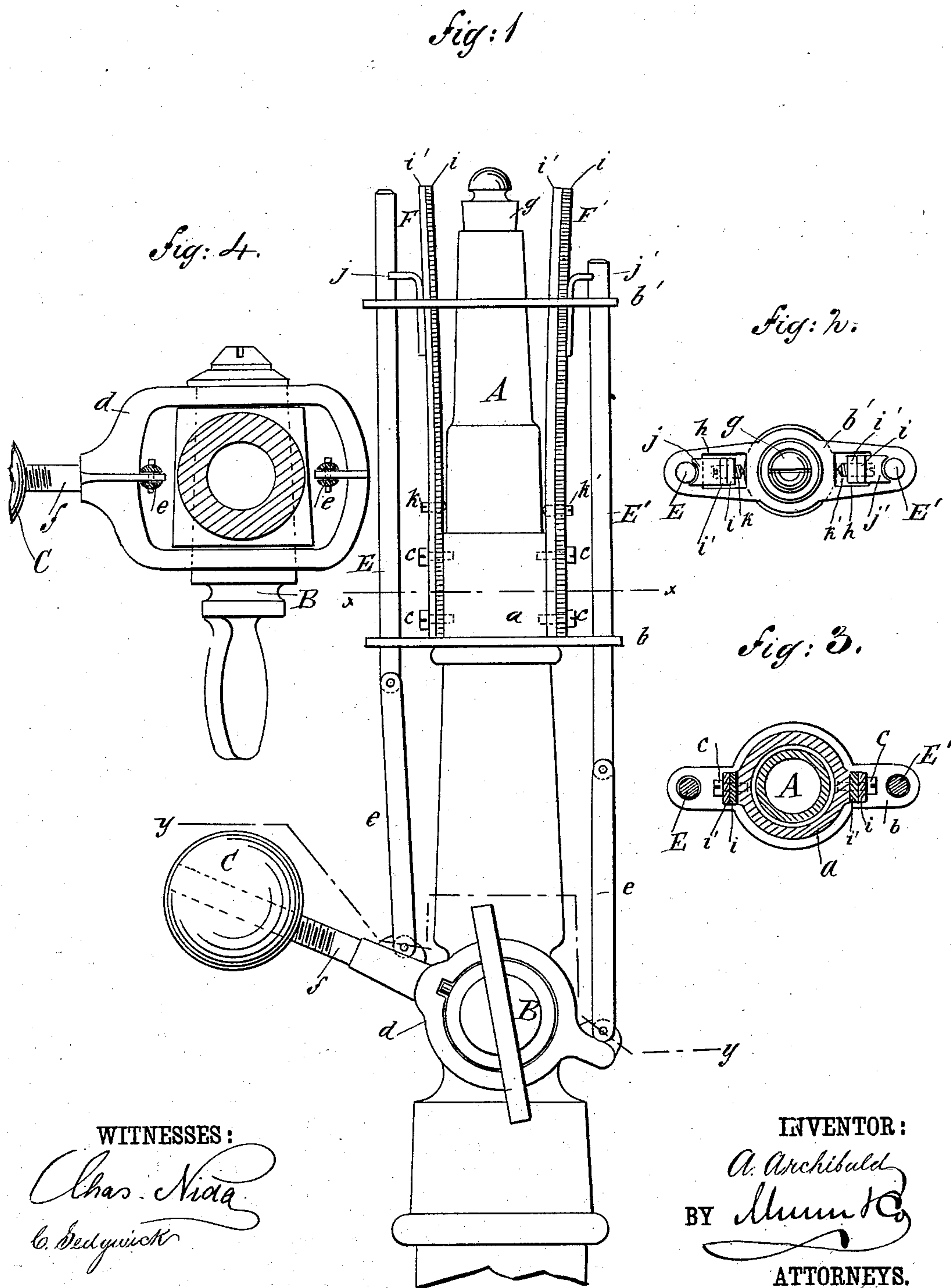
(No Model.)

A. ARCHIBALD.

AUTOMATIC SAFETY COCK FOR GAS BURNERS.

No. 277,975.

Patented May 22, 1883.





# UNITED STATES PATENT OFFICE.

ANDREW ARCHIBALD, OF YONKERS, NEW YORK, ASSIGNOR TO MARY H. ARCHIBALD, OF SAME PLACE.

## AUTOMATIC SAFETY-COCK FOR GAS-BURNERS.

SPECIFICATION forming part of Letters Patent No. 277,975, dated May 22, 1883.

Application filed October 23, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW ARCHIBALD, of Yonkers, in the county of Westchester and State of New York, have invented a new and Improved Automatic Safety-Cock for Gas-Burners, of which the following is a full, clear, and exact description.

The object of my invention is to provide a safety-cock for gas-burners which will automatically close when the light is extinguished, which will be reliable and certain in its action, and which will not interfere with the flow of gas while the gas is burning, nor materially with the light.

In carrying my invention into effect I employ a weighted valve, two tongues, of metal, of unequal thickness, made of a combination of two kinds of metal that expand and contract unequally under the action of heat and cold, so placed as to be heated by the blaze of the burner, and two sliding rods, attached to the cock held contiguous to the said tongues. The tongues of metal are reversed with respect to the blaze of the burner, so that they will bend or warp to and from the burner in the same direction during heating and cooling, thus causing one or the other of the tongues to continually press against one or the other of the rods for holding the valve open, according as to whether the gas is burning or not, except while the tongues are cooling, when the difference in time of cooling of the tongues, owing to their difference in thickness and quantity of material, leaves an interval of time in which both of the rods are released by the tongues, thus permitting the weight to close the valve.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of a gas-burner provided with one of my automatic safety-cocks. Fig. 2 is a plan view of the same. Fig. 3 is a sectional elevation taken on the line *x x* of Fig. 1, looking toward the tip; and Fig. 4 is a sectional plan view taken on the line *y y* of Fig. 1, looking toward the base of the burner.

A is the burner, which is of the ordinary

form, except that it is made with the enlargement *a*, and formed or provided with the guide-plates or flanges *b b'*; and B is the gas-cut-off cock, which has attached to it, by means of the yoke *d* and arm *f*, the adjustable weight C.

Connected to the yoke *d*, by means of the hinged connecting-rods *e e*, are the sliding valve-rods E E', which pass up through the guide-plates *b b'* on opposite sides of the burner.

Secured on opposite sides of the enlargement *a*, by means of the screws *c c*, are the metal tongues or plates F F', which are on the same plane with the rods E E', and reach up through the slots *h h* in the guide-plate *b'*, and stand nearly on a level with the top of the burner-tip *g*, as shown in Fig. 1, so that the blaze when the gas is lighted will heat them. The plate F', when hot, will bend or warp toward the burner A, and will assume its normal position on cooling, while the plate F will bend or warp away from the burner when hot, and while cooling will approach it. This action of the tongues of metal I produce by making them of a combination of two metals that expand and contract unequally under the action of heat and cold, and by placing them in reverse position relative to the blaze—that is, the tongues are by preference made of the plates *i i*, of brass, welded, soldered, brazed, or otherwise secured to the plates *i' i'*, of steel or iron. The tongue F' is placed with its brass side away from the blaze, while the tongue F is placed with its brass side next to the blaze, as indicated in Fig. 1. The tongue F' is made thicker than the tongue F, so that the movement of the former while heating and cooling will be slower than that of the latter. The tongues are provided upon the outside with the friction-plates *j* and *j'*, which are adapted to come against the rods E E', for holding the cock B open—the former when the parts are hot, the latter when they are cold. Above the screws *c c* the tongues are provided with the set-screws *k* and *k'*, by which the tongue may be adjusted to stand in the proper relation to the rods E E'. This adjustment with respect to the tongue F' must be such that the friction-plate *j'*, attached to the outside of the tongue, will be held with sufficient force against the rod E' when the parts are cold to a little more



than counterbalance the weight C, so that when the cock is opened for lighting the gas it will be held open by the outward pressure of the said tongue F'; but this outward pressure of the tongue must not be so great but that the warping of the tongue toward the burner when hot, caused by the greater expansion of the brass *i* on the outside of the tongue, will release the rod E'. With respect to the tongue F the adjustment must be such that the friction-plate *j*, secured to the outside thereof, will not bear against the rod E when cold; but when hot the warping of the tongue away from the burner, caused by the greater expansion of the brass next to the blaze, will cause the friction-plate *j* to be pressed with sufficient force against the rod E to more than counterbalance the weight C, so that the valve will be held open by the outward pressure of the tongue F after the rod E' is released by the tongue F' and all the time the gas is burning.

As above mentioned, the tongue F' is made thicker than the tongue F, so that, owing to the difference in quantity of material, the movement of the latter, both in heating and cooling, will be more rapid than that of the former. The object of this is twofold: First, while the tongues are heating, it causes the tongue F to effect its hold upon the rod E before the rod E' is released by the rod F', thus holding the cock open continually from the time it is first opened for lighting the gas until the gas is extinguished; and, secondly, when the gas is extinguished and the tongues are cooling, it causes the tongue F to release the rod E before the tongue F' effects its hold upon the rod E', thus leaving an interval when both rods are released, thus leaving the weight C free to close the cock B. In this manner it will be seen that the device in no way affects the flow of gas while it is burning, that it does not materially interfere with the light, and that it is automatic and certain in its action, doing away with all danger of the escape of gas into the apartment whether the light be extinguished by turning the cock in the service-pipe in the proper way or by blowing the light out.

My invention is alike applicable to both gas-heating and gas-lighting burners.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a gas-burner, the combination, with plates or tongues that are adapted to warp to and from the blaze under the action of heat and cold, of the rods E E' and weighted cock or valve B, substantially as and for the purposes set forth.

2. In a gas-burner, the combination of the reversed tongues F F', made of plates of metal that expand unequally under the action of heat and cold, with means, substantially as described, for holding the weighted cock or valve B open while the gas is burning, as set forth.

3. The tongues F F', of unequal thickness, in combination with the rods E E' and weighted valve B, substantially as and for the purposes set forth.

4. The tongues F F', of different thicknesses and made of plates of different metal of dissimilar expansibility and contractibility, in combination with the burner A, sliding rods E E', and weighted valve B, as and for the purposes set forth.

5. The plates F F', provided with the set-screws *k k'*, in combination with the rods E E', and cock B, and weight C, as and for the purposes set forth.

6. The burner A, provided with the guide-plates *b b'*, and having the tongues F F' secured to it, in combination with the valve B, weight C, rods E and E', and hinged connecting-rods *e e*, the tongues F F' being provided with the plates *j* and *j'*, substantially as and for the purposes set forth.

7. The cock B, provided with the yoke *d*, having the adjustable weight C, in combination with the sliding rods E E', connections *e e*, guide-plates *b b'*, and the tongues F F', adapted to alternately grasp and release the rods E E', while heating and cooling, for holding the cock open and permitting it to close, substantially as set forth.

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Witnesses:

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