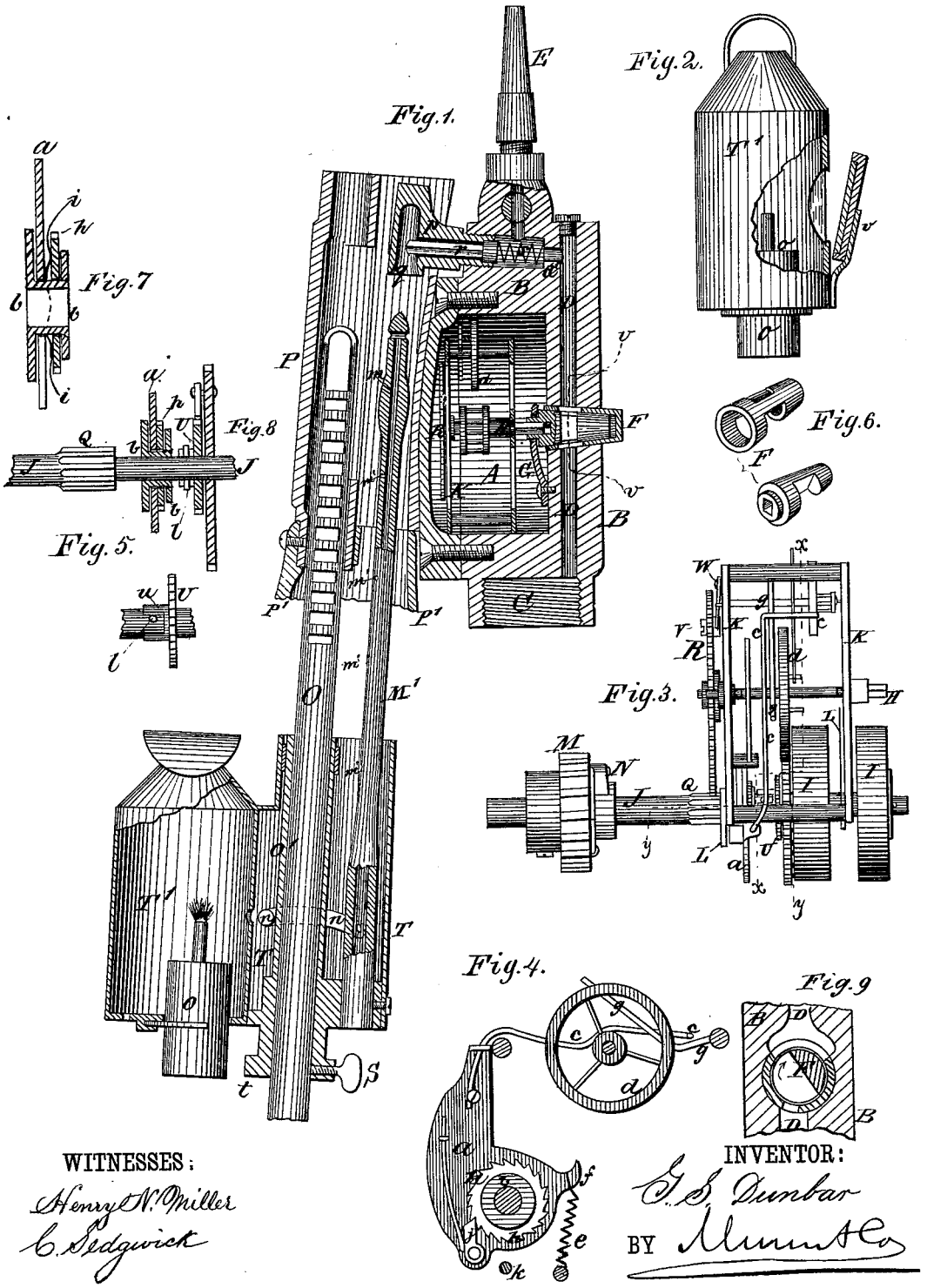
G. S. DUNBAR.

Gas-Lighter and Automatic Extinguisher.

No. 200,703. Patented Feb. 26, 1878.



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IMPROVEMENT IN GAS-LIGHTER AND AUTOMATIC EXTINGUISHER.

Specification forming part of Letters Patent No. **200,703,** dated February 26, 1878; application filed January 23, 1878.

To all whom it may concern:

Be it known that I, GEORGE S. DUNBAR, of Pittsfield, in the county of Berkshire and State of Massachusetts, have invented a new and Improved Gas-Lighter and Automatic Extinguisher, of which the following is a specification:

My invention relates to improvements in automatic gas-lights and extinguishers generally, and more especially to that patented by me April 25, 1874, and numbered 153,549, the object being to provide improved devices for starting the train of clock-gear when the spring is wound, and for extinguishing the light, and for lighting the gas, as will be hereinafter described.

In the accompanying drawing, Figure 1 represents a vertical section of my improved gas-lighter and automatic extinguisher. Fig. 2 is a detail of the lamp, partly in section. Fig. 3 is a top view of the clock mechanism removed from the casing. Fig. 4 is a sectional detail of the starting mechanism, taken on the line *x x* of Fig. 3. Figs. 5, 6, 7, and 8 are details, the latter being a section taken on the line *y y* of Fig. 3. Fig. 9 is a cross-section of the gas-valve to the burner, the section being taken through the line *v v* of Fig. 1.

Similar letters of reference indicate corresponding parts.

A is a chamber in a metal case, B, which screws onto the lamp-post at C, and has a passage, D, for the gas to pass along one side of the chamber to the burner E. In the passage D is a conical valve, F, to shut off the gas and extinguish the light when it is turned for the purpose by the clock-work contained in the chamber A, the conical plug of the valve F being socketed centrally in its stem to receive the square end of the shaft H of the clock-gear.

G is a flat spring, secured by a screw at one end to the inside of the case B, and surrounding with its other end the stem of the plug of valve F, to press on an annular shoulder of the latter, and keep the valve-cone to its seat in a gas-tight manner without unnecessary friction.

The axis of the valve F is at right angles to the passage D, and the latter is widened at the outlet side of the valve F in the direction of its movement, and the valve-cone recessed beyond its axis, as seen in the drawing, so as to allow of about three-fourths of a turn of the valve and a lapse of sufficient time before the gas is shut off.

I are the clock-springs for turning the train, mounted on a shaft, J, which is secured on the frame K by caps L, so that it can be put on and taken off without taking the train apart. The shaft J has an extension, (inclosed in a tubular case,) with a toothed wheel, M, and a pawl and ratchet, N, for winding up the spring by a toothed bar, O, which is slid along the wheel M in a guide-tube, P, by hand for turning the said wheel M. This wheel M, by the pinion Q on shaft J and the gear-wheel R on shaft H, turns the valve F back to set at the same time as it sets the springs I. The extent to which it is turned back, and which determines the time the clock will run before extinguishing the light, is governed by the length at which the toothed part of the bar O is entered into the guide-tube P in gear with the wheel M. The said length is adjusted by the set-screw *s* in the collar *t* of the lighter-casing T, according to a scale on the bar O, and readable at the upper edge of said casing. The said scale is graduated to the springs I and the train, so that the valve F may be set to turn off the gas at any predetermined time by adjusting the bar O to the mark on the scale corresponding with the time wanted.

The wheel M, being connected to the shaft J by the ratchet and pawl N, allows the bar O to be withdrawn and the wheel M to turn with it without turning the shaft J after starting the clock.

U is the usual ratchet mechanism employed in connection with the shaft J and clock-springs I, to allow of the springs being wound without turning the clock-train. V is a stud in the wheel R, which, by contact with the lever W, when the free end of the latter is pushed against the axle of the escapement-wheel, stops the clock mechanism when the light is extinguished, as shown in my former patent.

In order to start the train when wound up, in case it should not start by the springs, a lever-plate, *a*, is fitted to turn upon a flanged hub, *b*, secured on the shaft J, and is provided

with a wire, *c*, which is bent so as to come in contact with the balance-wheel *d* when raised a little by a movement of the lever *a*. The wire *c* is brought back to give a sudden impetus to the balance-wheel, and consequently a start to the clock, by a light spring, *e*, connecting the frame-work K with a hook or projection, *f*, formed upon the lever-plate *a*.

g is a wire secured to the frame K, to serve as side guide and end stop for the impulsive return movement of the wire-spring *c* in pushing the balance-wheel *d*.

h is a ratchet-wheel, fitted to turn upon the hub *b* at the side of the lever *a*, and tightened in position by an annular friction-spring, *i*, which is interposed between the ratchet *h* and one of the flanges of the hub *b*. The spring *i* is so much stronger than the spring *c* as to cause the ratchet *h* to follow the movement of the hub *b*, and oscillate the lever *a* by contact with the pawl *j* against the pull of the spring *e* when the shaft J is started to turn and wind the springs I.

The oscillation of the movement of the lever *a* is limited by a stop, *k*, on the frame K striking against the lever *a*, and preventing the ratchet *h* from being carried farther with the movement of the hub *b* by the friction of the spring *i*. In order to give enough of play between the movements of the shaft J and the ratchet U of the springs I to allow of the requisite oscillation of the lever *a* for pushing the balance-wheel *d* by the wire *c* without affecting the springs I, the hub *u* of the ratchet U is provided with a slot or notch of suitable width, in which the pin *l*, connecting the shaft J and the hub *u*, can move a little without carrying the hub with it. The lighter and lamp casing T T′ is fitted upon the winding-rod O by the sleeve *o′*, and secured by the set-screw S, as before stated.

M′ is a hollow lighter-rod, having perforations *m′* at intervals, and connected by a perforated pipe, *n*, to an opening in the partition between the lamp-casing T′ and the lighter-casing T, in proximity to the light of a lamp, *o*, which latter is secured in any suitable manner in the casing T′. The rod M′ is secured in a socket or hole in the bottom of the casing T by a set-screw, as shown in Fig. 1.

In an offset, *d′*, in the gas-passage D, near its entrance to the burner E, is inserted from the outside a hollow screw-plug, *p*, having a horizontal passage, in which is seated a square stem-valve, *r*, working in line with the passage *d′*, in which latter a spiral spring, *s*, is inserted to hold the valve *r* to its seat. At about right angles to the valve-passage the plug *p* has a socket, *q*, the mouth of which is turned downward, and is flaring to receive and fit tight on a swell or shoulder, *m*, of the rod M′, when the upper end of the latter is introduced in the socket *q*, the plug *p* being arranged to project into the guide-tube P to present the socket *q* in proper position for that purpose. When it is desired to light the gas, and the bar O is inserted and pushed up into the guide-tube P to set the valve F and wind the springs I, the hollow rod M at the same time enters with its tapering upper end into the socket *q*, and pushes aside the projecting end of the stem of the valve *r*, thus opening the said valve. The upper edge of the lighter-casing T at the same time enters and closes against the inner surface of the flaring mouth P′ of the guide-tube P. A jet of gas from the passage D will then rush through the valve *r*, the hollow rod M′, and the connecting-pipe *n* into the lamp-case T′, and be ignited from the lamp *o*. The flame will leap from one to the other of the perforations *m′* until it blazes up through the upper end of the guide-tube P and ignites the gas issuing from the burner E. In withdrawing the lighter the valve *r* closes.

v is a reflector arranged in front of a paned opening in the lamp-case T′, to reflect the lamp-light upward and illuminate the mouth P′ of the guide-tube P, to facilitate the insertion of the winding-rod *o* and lighter-rod M′.

I do not limit myself to the exact form and arrangement of any of the parts here shown, as they may be varied without departing from my invention.

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

1. In combination with the balance-wheel *d*, the wire *c*, or equivalent, operated to start the train of gear by the rocking play motion of the main or spring shaft J, substantially as specified.

2. The combination of the balance-wheel *d*, wire *c*, lever *a*, friction ratchet and pawl *h j*, spring *e*, and flanged hub *b* with the main shaft J, having pin *l* and the slotted or notched hub *u* of the ratchet U of the main or driving wheel, substantially as and for the purpose set forth.

3. The spring-pressed time-valve F, arranged upon the end and in the axial line of the shaft H of a clock mechanism, in combination with the passage D, leading to the burner E, substantially as and for the purpose set forth.

4. The hollow perforated rod M′, in combination with the valve *r* and lamp *o*, substantially as and for the purpose set forth.

5. In combination with the winding-rod O, the lamp *o* and reflector *v*, substantially as and for the purpose set forth.

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