No. 740,805. PATENTED OCT. 6, 1903.

V. E. CAMPBELL.

AUTOMATIC GAS CUT-OFF.

APPLICATION FILED NOV. 5, 1902.

NO MODEL.

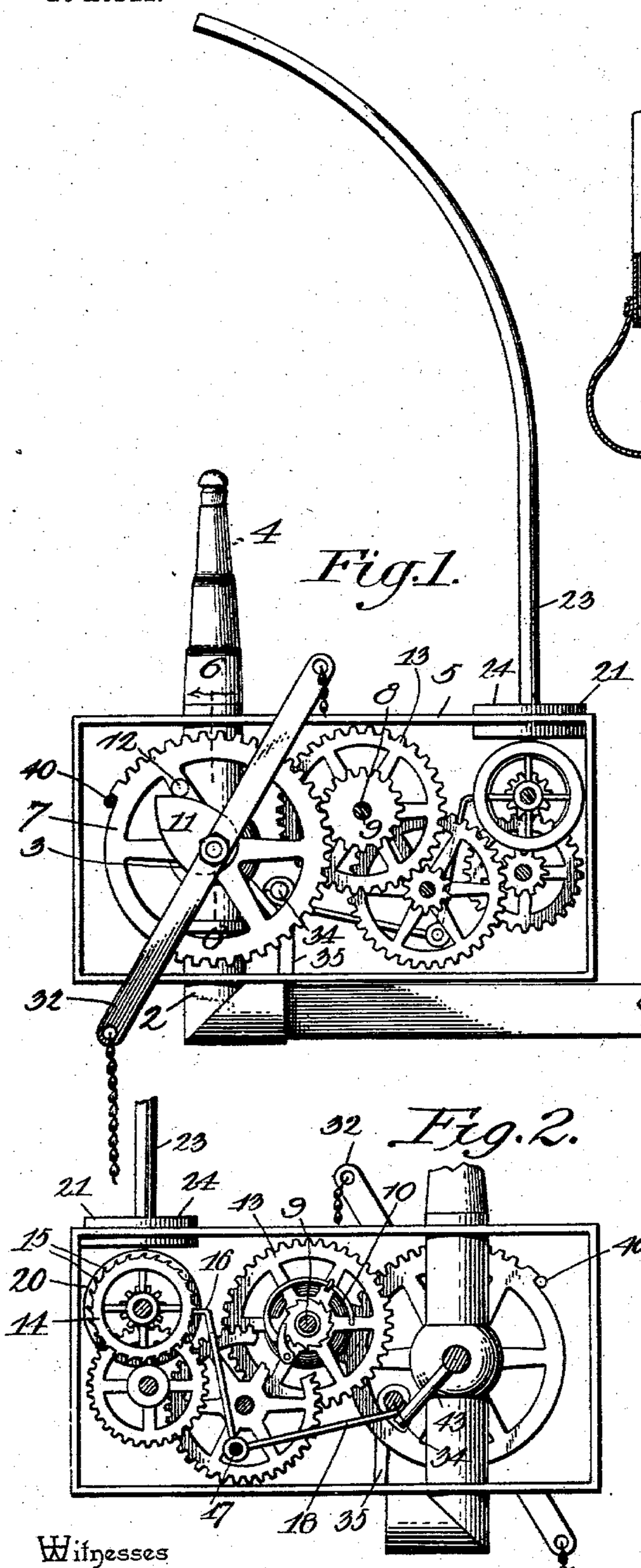

Fig. 1.

Fig. 2.

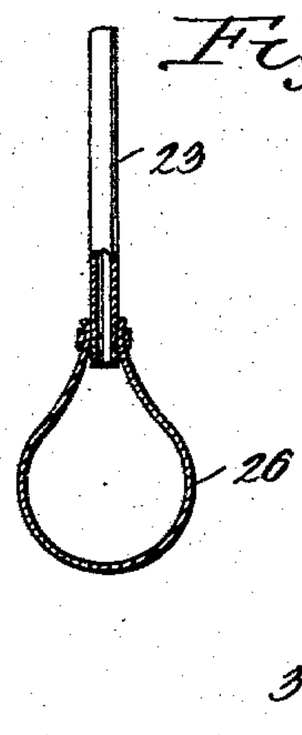

Fig. 5.

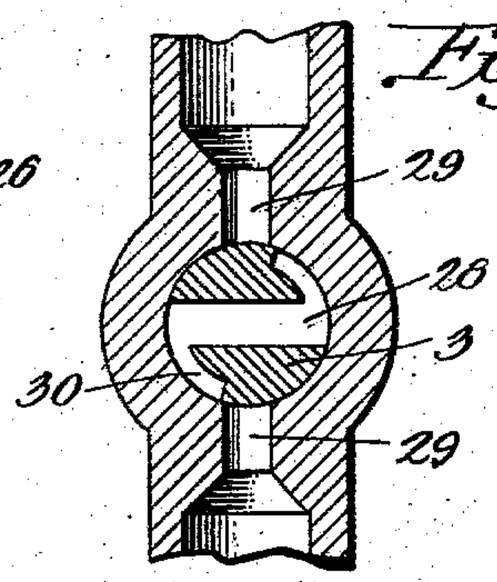

Fig. 3.

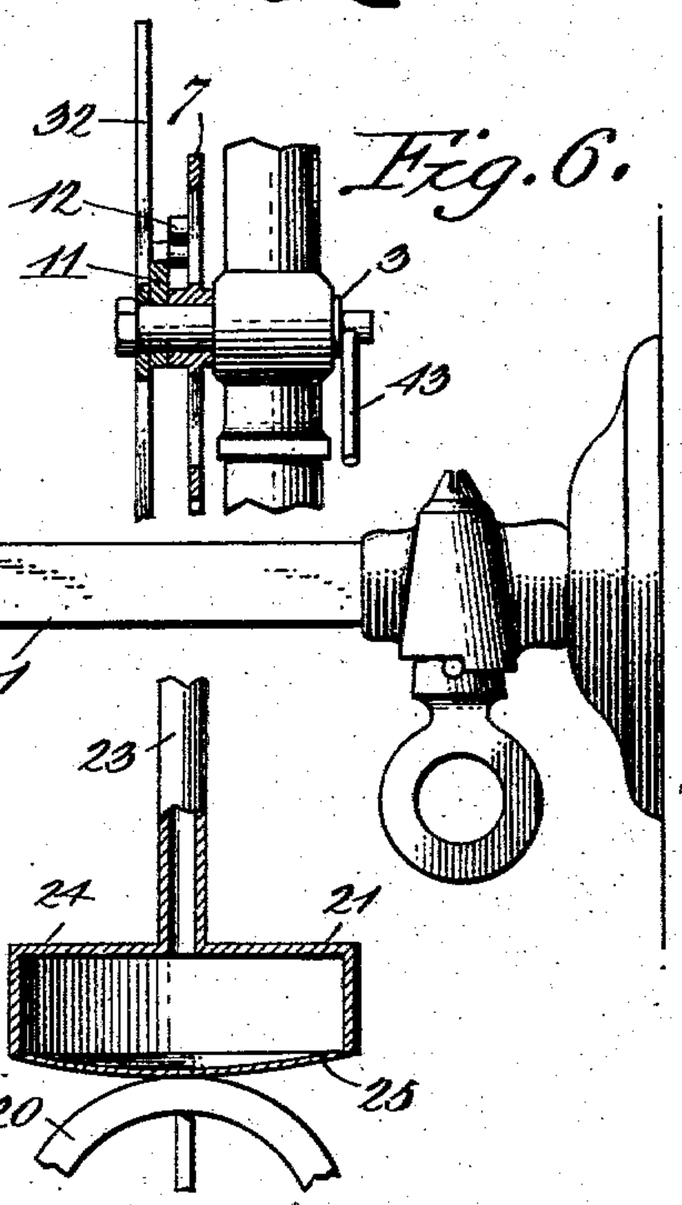

Fig. 6.

Fig. 4.

Witnesses

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No. 740,805. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

VICTOR E. CAMPBELL, OF GOLDENDALE, WASHINGTON.

AUTOMATIC GAS CUT-OFF.

SPECIFICATION forming part of Letters Patent No. 740,805, dated October 6, 1903.

Application filed November 5, 1902. Serial No. 130,189. (No model.)

To all whom it may concern:

Be it known that I, VICTOR E. CAMPBELL, a citizen of the United States, residing at Goldendale, in the county of Klickitat and State of Washington, have invented a new and useful Automatic Gas Cut-Off, of which the following is a specification.

This invention relates to automatic gas cut-offs; and it has for its object to provide a device of this class which shall be simple in construction, certain and effective in operation, and in which when a gas-jet is extinguished either carelessly or accidentally the device shall operate to shut off the gas-cock certainly and almost instantaneously.

My invention may be described as being an improvement on Letters Patent of the United States No. 667,186, granted to myself on the 5th day of February, 1901; but whereas in this former patent I availed myself of the heated air ascending from the gas-jet for the purpose of actuating mechanism whereby the supply-cock was held open and retained in that position as long as the jet was burning in the present case I avail myself of a thermostat of peculiar construction, said thermostat being so disposed as to effect the desired result in a simple and practical manner.

Specifically my invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particulary pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation showing my invention applied to an ordinary gas-bracket, the side of the casing having been removed to expose the interior construction. Fig. 2 is a side view taken from the opposite side of the device and likewise with the side of the casing removed. Fig. 3 is a sectional view taken vertically through the burner-pipe and illustrative of the construction of the gas-cock. Fig. 4 is a sectional elevation of the operating end of the improved thermostat used in connection with my invention, showing the same expanded so as to engage the brake-wheel, a portion of which has also been shown. Fig. 5 is a detail sectional elevation illustrating a modified construction of the thermostat. Fig. 6 is a sectional detail view taken on the line 6 6 in Fig. 1.

Corresponding parts in the several figures are indicated by similar numerals of reference.

1 designates an ordinary gas-bracket terminating in the burner-pipe 2, having the cock 3 and the burner 4. Supported upon this bracket adjacent to the burner-pipe 2, which it incloses, is a casing 5, containing the gearing and operating parts of the device. This gearing, although slightly differently arranged, is practically identical with that shown in my Letters Patent above referred to. The spindle of the gas-cock 3 carries a loosely-mounted wheel 7, having peripheral teeth which mesh with a pinion 8 upon a spring-arbor 9. A connection between the gas-cock spindle and said wheel provides for communicating motion from the spindle to the wheel during the opening movement of the gas-cock to wind the spring 10, which is attached to said arbor, said means being composed of an arm 11, attached to the spindle and engaging the stud or projection 12 upon the said disk, whereby when the gas-cock is opened it turns the disk to the limit of its movement, but leaves the gas-cock spindle free to rotate in the opposite direction to a sufficient extent to cut off the gas independently of the wheel 7. This provides for turning on the gas in the usual way, and thereby winding the cut-off spring, and the subsequent turning off of the gas in the ordinary way by a reverse or closing movement of the gas-cock. Also carried by the spring-arbor is a gear-wheel 13, connected by intermediate gearing involving any desired number of speed-multiplying elements with an escapement-wheel 14, preferably provided with peripheral teeth 15, the periphery of said escapement-wheel being arranged in the path of an escapement-lever, which in this case constitutes one arm 16 of a bell-crank, mounted pivotally at 17 and having an arm 18 extended approximately at right angles to the lever-arm 16. The arm or member 18 of said escapement device should be sufficiently resilient to enable it to bend under the influence of an operating device to be hereinafter described. The spindle 19 of the escapement-wheel also carries a brake-wheel 20 of larger diameter than the said escapement-wheel.

21 designates the thermostat used in connection with my invention. My improved

thermostat is composed of a metallic tube 23 of suitable length and general dimensions, said tube being preferably composed of thin ductile metal. Said tube, the walls of which are made as thin as consistent with durability, is closed at its upper end, and it is connected at its lower end with an enlarged chamber or bulb 24, which is likewise hollow and the closure of which is composed of a thin metallic diaphragm 25. Said diaphragm or closure is preferably composed of thinner material than the remainder of the device, so as to cause it to expand more readily under the influence of the expansive force of the contents of the tubular device when heated. I would have it understood, however, that with regard to the dimensions of any of the component parts of the thermostat I do not limit myself in any wise. Neither do I limit myself to the specific form of thermostat here described, inasmuch as a variety of modifications equally well adapted to operate in connection with my invention may be adopted.

The thermostat 21 is connected with the casing 5 of my improved device in such a manner that the closure 25 of the expanded portion 24 shall be disposed closely adjacent to the periphery of the brake-wheel 20, while the upper closed end of the thermostat-tube shall be disposed in some suitable position where it will be exposed to the heat of the gas-jet when the latter is lighted. Thus in Fig. 1 of the drawings I have shown the said tube in full lines extended above the gas-jet. It may, however, occupy any position which shall expose it to the heating influence of the gas-jet. The tubular thermostat of this device may be filled with any suitable liquid, one that is readily expansible under the influence of heat being preferred. In place of liquid, gas, air, or any other fluid may be substituted, the object being simply to provide a means the expansive force of which shall cause the operative part of the thermostat to actively engage the brake-wheel when expanded by the heat of the gas-jet.

In Fig. 5 I have shown a modified form of the thermostat. The tube 23 of the latter is in this case provided in place of the chamber 24 simply with a rubber bulb or a bulb composed of any suitable elastic and expansible material which during the expanded state of the contents caused by the heat of the gas-jet shall expand sufficiently to engage the brake-wheel and prevent the return movement of the spring-actuated gearing. It is obvious that by employing a sufficient number of speed-multiplying elements in the gearing of the device only a very light touch upon the brake-wheel will be required to effect the desired result.

The gas-cock is provided in the usual manner with a transverse bore 28, which in its normal or closed position is disposed at right angles to the bore 29 of the burner-pipe. The bore 28 is provided at opposite ends thereof with oppositely-extended grooves or channels 30, the object of which is to maintain communication between the bores 28 and 29, thus permitting the gas to flow freely without being cut off during the slight interval between the lighting of the gas-jet and the sufficient heating of the thermostat to cause the operating end of the same to engage the brake-wheel, and thereby prevent any further reverse movement.

The spindle of the gas-jet is provided with a suitable handle, in this case illustrated as a lever 32, the oppositely-extended arms of which may be provided with depending cords or chains, enabling it to be easily reached and manipulated. The opposite end of the said spindle is provided with an arm 43, lying in the path of the resilient arm 18 of the escapement-lever and adapted under certain circumstances, which will be presently described, to engage the said arm 18 and to hold it in contact with a stud 34, which may be mounted upon a bracket 35, rising from the casing or otherwise suitably disposed, thereby serving to hold the arm 16 of the escapement-lever in contact with the escapement-wheel and preventing reverse movement of the gearing under the influence of the spring 10.

The operation of this device will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed. When the gas-cock is turned and the gas-jet is lighted, the contents of the thermostatic device is almost instantly expanded, thus engaging the brake-wheel and preventing reverse movement of the gearing. The few moments that elapse before the thermostat is sufficiently expanded to operate will not cause the gas to be even partially cut off, owing to the peculiar construction of the cock, as herein described, which enables it to be partially turned without affecting the flow of gas. The device remains in this position until the gas-jet is extinguished, when the cooling and contracting of the thermostat releases the brake-wheel, thereby causing the actuating-spring to restore the gas-cock to its closed position. This operation takes place, however, only when the gas-jet is extinguished carelessly or accidentally. When the gas-cock is turned by means of the handle attached thereto, the arm 43 will engage the member 18 of the escapement-lever, throwing the latter into engagement with the escapement-wheel and acting as a brake upon the latter to prevent return movement of the gearing.

It is obvious that from the gear-wheel 7 upon the spindle of the gas-jet a portion of the teeth are removed, and a stud 40 is provided upon the frame to limit the movement of said wheel or disk, as well as of the gas-cock connected therewith, permitting the latter to be rotated only sufficiently to turn on or cut off the gas, as may be required.

I desire it to be understood that regarding the detailed construction of this device I do not wish to be regarded as limiting myself in any particular, but reserve the right to any

changes, alterations, and modifications which may be resorted to without departing from the spirit and scope of my invention or sacrificing the utility of the same.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a device of the class described, the combination of a gas-cock, spring-actuated means for closing the same, a brake-wheel connected by a train of speed-multiplying elements with said closing means, and a tubular thermostat having an expansible closure located in the path of said brake-wheel.

2. In a device of the class described, the combination of a gas-cock, spring-actuated means for closing the same, and brake mechanism for temporarily preventing such closure, said brake mechanism comprising a brake-wheel connected by a train of gears with the spring-actuated closing means, and a thermostatic braking device comprising a tube disposed within the range of the heating influence of the gas-jet, a chamber fixedly secured above the brake-wheel, and an expansible closure for said chamber, disposed in the path of and adapted to impinge upon said brake-wheel.

3. In a device of the class described comprising spring-actuated means for closing the flow of gas, a brake-wheel connected by a train of gears with said closing means and a thermostatic device disposed to act as a brake against the periphery of the brake-wheel, a gas-cock having a transverse bore and channels extending in opposite directions laterally from said bore to connect said bore with the bore of the burner-pipe when the gas-cock is partially turned off.

4. In an automatic gas cut-off, a brake-wheel connected with the means for effecting the closure of the flow of gas, in combination with a tubular thermostat having an expansible closure located in the path of the periphery of said brake-wheel and having its other end extended within the heating influence of the gas-flame.

5. In a device of the class described, a thermostat having an expansible closure disposed adjacent to and adapted to frictionally engage, the periphery of a brake-wheel.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

VICTOR E. CAMPBELL.

Witnesses:

JOHN E. CHAPPELL,

THOMAS B. MONTGOMERY.