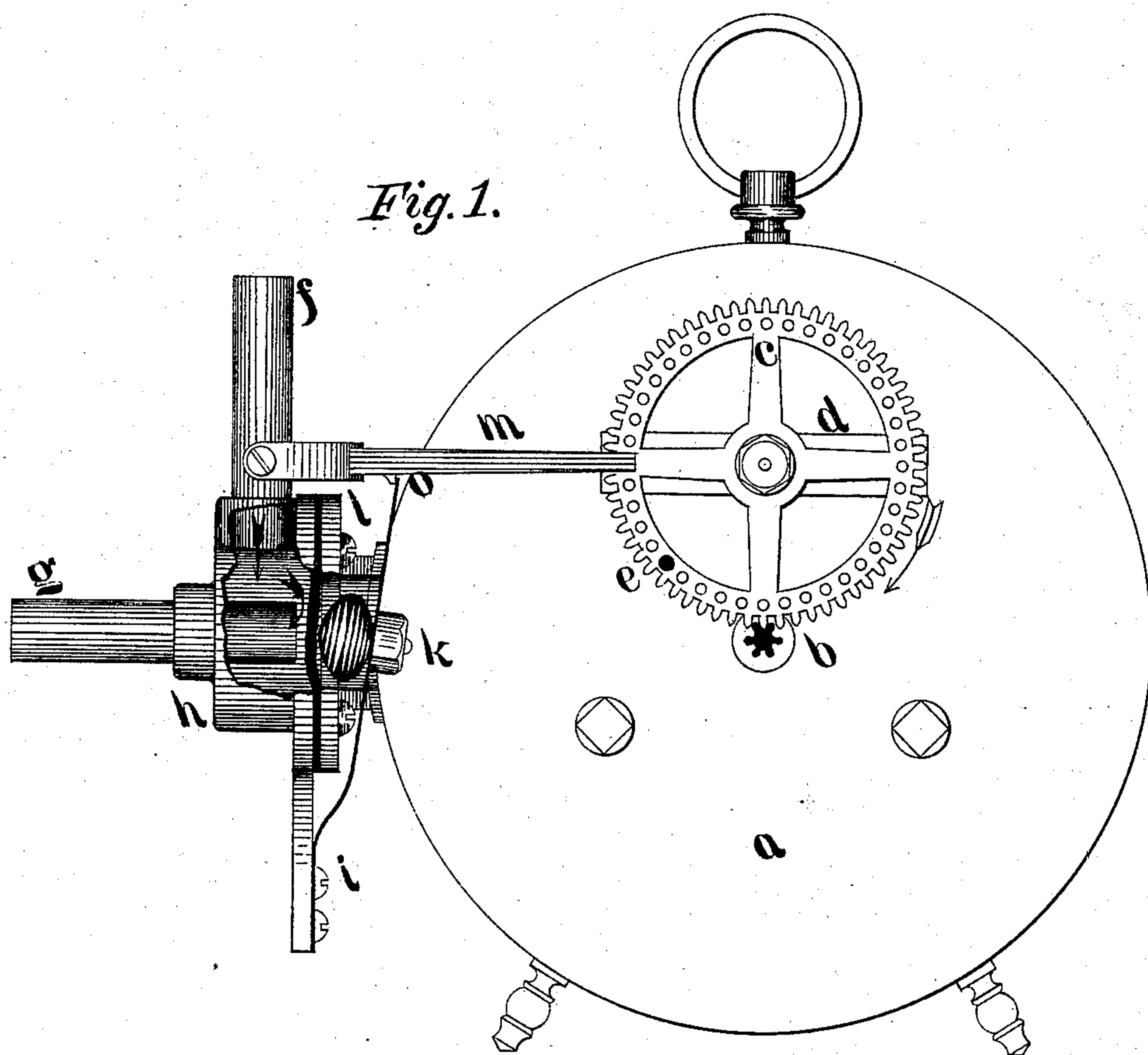


(No Model.)

2 Sheets—Sheet 1.

T. SHAW.
Time and Pressure Regulator for Vulcanizing Apparatus.
No. 241,734.
Patented May 17, 1881.



WITNESSES:

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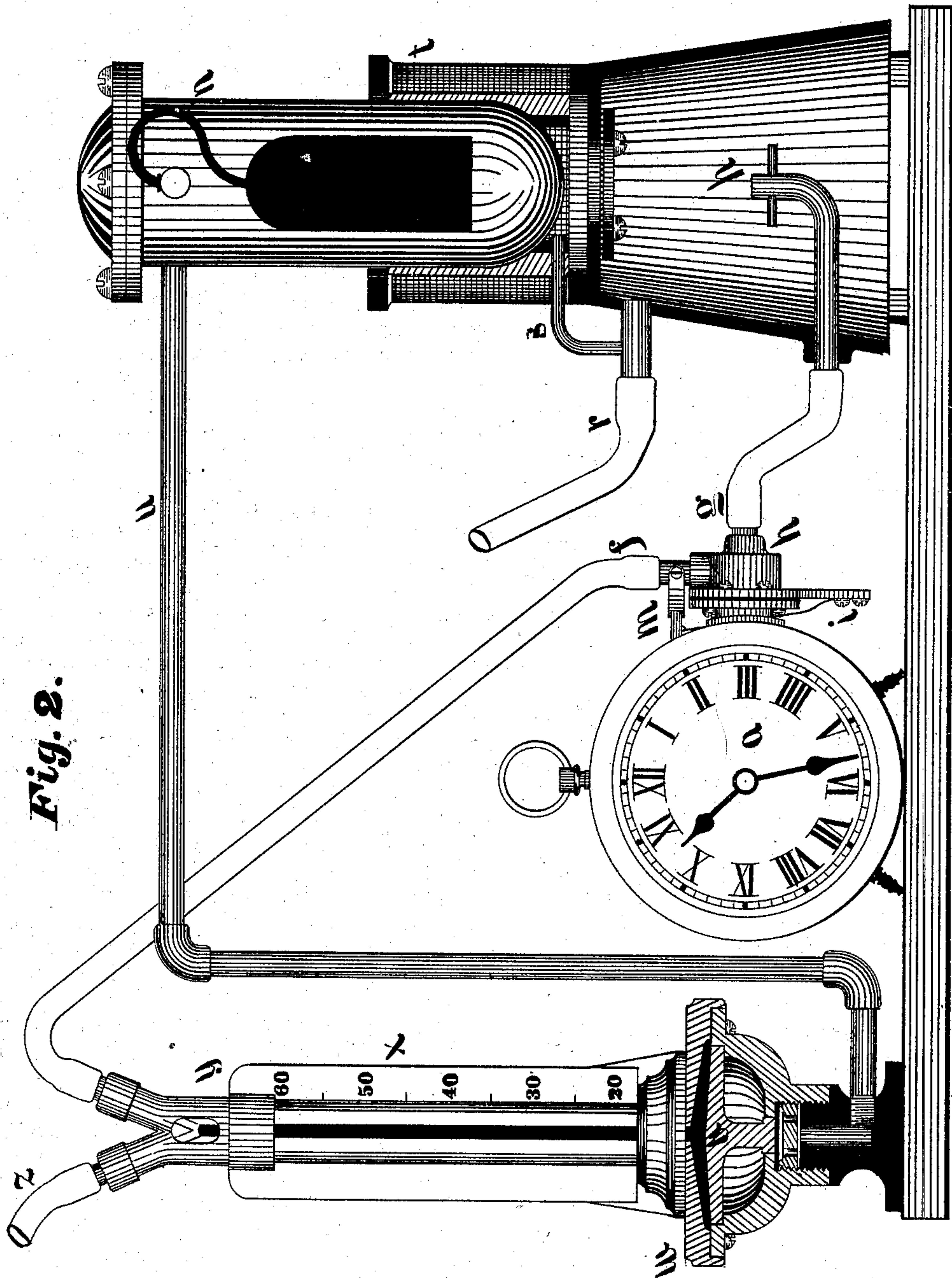
T Shaw INVENTOR

ATTORNEY

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UNITED STATES PATENT OFFICE.

THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

TIME AND PRESSURE REGULATOR FOR VULCANIZING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 241,734, dated May 17, 1881.

Application filed April 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and improved time and pressure regulator for controlling vapor-pressure for vulcanizing and other purposes where gas is employed as a means of generating heat; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the combining a mercurial pressure-gage with gas-passageways, arranged as hereinafter described, and in a peculiar valve operated by clock mechanism in the manner and for the purpose hereinafter described.

The object of the invention is to control automatically vapor-pressures where the pressure is generated by heat of gas or gasoline in such a manner that the pressure shall be as uniform as possible when set at any predetermined pressure, and to shut off the gas and cease operation at any definite predetermined time, all operating in the manner as hereinafter explained.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of this specification, Figure 1 represents rear view of clock and part sectional view of valve. Fig. 2 represents front view of clock and valve and part sectional view of mercury-gage regulator and part sectional view of gas-heating steam appliance, all arranged and operated as hereinafter described.

Similar letters refer to similar parts, of which—

a, Fig. 1, is an ordinary clock. On the minute-spindle is provided a pinion, *b*, operating in gear-wheel *c*, which gear-wheel revolves on ordinary stationary axle secured to block on beam-support *d*, which, in turn, is secured fast to back of clock. Said wheel *c* is provided with numerous holes, (shown in its rim,) into any one of which a pin, *e*, is placed. Said holes represent fractions of an hour, prolonging the time of contact of pin *e* with a lever, *m*,

in proportion as it is distant from said lever. Said wheel *c* rotates in the direction of the arrow, and is actuated by the pinion *b* on the minute-spindle of clock.

k is a peculiar check-valve arranged to complete the invention. The body of said valve is constructed of metal cylinder *h*, having a projecting casting on one side of configuration adapted to shape of side of clock-case, as shown, to enable its firm attachment to the side of clock-case by solder, screws, or otherwise. Said cylinder *h* is provided with outlet-tube *g*, that projects in said cylinder, as shown, and has a flexible diaphragm of rubber or leather shown stretched across the whole diameter of cylinder *h*, and is secured in place by screw-flange *l*, shown. Said diaphragm is capable of being pressed firmly over the mouth of tube *g* by valve *k*, actuated by its spring-support *i*, said spring being secured in place, by screws at *i*, to a projecting arm of cylinder *h*, shown. Said valve *k* is secured to spring *i* by the nut shown at *k*. The spring is set to spring inward to close the valve tight against the mouth of exit-pipe *g*, and is held from said action only by lever *m*, which lever is pivoted to inlet-pipe *f* by an ordinary screw-pivot joint, shown, and is provided with a point, (shown at *o*), which holds the spring-valve off and open until said lever *m* is lifted by the action of pin *e* on wheel *c*, all to operate in the manner and for the purpose as hereinafter explained.

w, Fig. 2, represents Shaw's mercury pressure-gage, with the usual index, *x*, part in section to show the plunger *v* actuating the mercury above the same, shown in this case in black to make the mercury-column prominent up the usual glass tube to the cross metal branch *y*, at which point a small plate-glass is inserted, and held in place by cement to enable the mercury-column to be viewed at the regulating-point *y* when operating, as hereinafter explained.

t is an ordinary gas-heating appliance for heating a cylinder of water, *n*, provided with ordinary weighted valve, (shown at *n*), and provided with steam-pipe *u*, that connects with gage *w* at the point shown.

The gage, clock-valve, and gas-heating appliance are all secured, for convenience, to one

common base, and a gas-pipe, *z*, leading from any source of gas-pressure, connects with the inlet end of the joint *y*. The gas passes through the joint *y* in the angular passage-way shown to the pipe *f*, through the described valve on clock to outlet-pipe *g*, to the interior of gas-heater *t* at *p*, where the gas is caused to come out of small apertures to commingle with the air, which has access beneath the base of said gas-heater. After the air has commingled with the gas it passes upward through a gauze partition shown beneath the cylinder *n*, at which point it is ignited in the usual manner. A small jet of gas is provided on the end of tube *s*, which is kept ignited to insure the burning of the principal gas-flame against any accident of wind or other cause. Said gas-jet *s* is fed with gas by connecting tube *r* with gas-pipe *g*, or from any other convenient gas attachment. One end of pipe *r* is secured fast to body of gas-heater, for convenience of holding the same in position, as shown.

This invention is operated in this wise: Any vulcanizing or other process to be operated with in this manner is placed into or in connection with cylinder *n* by unscrewing the cap or otherwise in the ordinary manner, and the gas is turned on to pipe *z*, regulated by ordinary stop-valve, in sufficient quantity to supply the maximum amount of gas to heater *t*. The spring-valve *k*, Fig. 1, is opened out in position shown, and secured in place by catch *o* on lever *m*. The clock is wound up to run the clock-gear in the ordinary manner. The pin *e* is inserted in any desired aperture, according to the time it is desired to have the heat operate. Each aperture in this case represents fifteen minutes, so that the device can be set for four or more hours. The gas is ignited in the gas-heater, when the invention is in a condition to take care of itself automatically. The gas-flame heats up any water placed in the cylinder *n*, which in time accumulates pressure, which actuates the mercury in gage *w* and causes it to rise to a predetermined pressure which the gage is arranged for—in this case seventy pounds—at which time the mercury has reached the junction of gas-passage-way at *y*, and partially closes the same, reducing the

amount of gas admitted to the heater. If the gas be closed too much, the pressure will fall in the cylinder and the gage thus given a greater flow of gas, varying in very narrow limits, and under perfect control automatically without any attention from the operator after it is once started. This operation of controlling the pressure continues until the desired predetermined time has arrived to cease the operation, which time is fully indicated by pin *e* coming in contact with lever *m*, releasing the spring, which actuates the valve and closes down and shuts the gas off in a certain and reliable manner, the mechanism of valve being of such a character that it is not liable to stick by gas-deposits, as in the ordinary plug or check valves, and the mercury-column of gage is alike free from sticking or clogging, the united action of pressure and time regulator here shown being of such a reliable character, as proven on tests, that it can be trusted with the most expensive work to be taken care of automatically when once properly started.

It is evident that the several features and configurations of parts shown will suffer considerable modification without any alteration in the result. I therefore do not wish to confine myself to the exact shape shown; but

What I do claim, and desire to secure by Letters Patent, is—

1. The mercury-pressure-regulating gage *w*, operating in connection with the gas-passage-ways, in the manner described, and for the purpose set forth.

2. The valve *k*, operating to close on the exterior of a flexible diaphragm, in combination with a tube or cylinder valve-seat, *g*, in which said diaphragm is caused to close, operated by spring or other equivalent force, as described, for the purpose set forth.

3. Cog-wheel *c*, arranged to operate with a clock, *a*, and provided with aperture or other equivalent means of securing pin *e*, to operate in combination with lever *m* and spring *i*, substantially as and for the purpose set forth.

THOMAS SHAW.

Witnesses:

WM. B. HUGHES,
WM. GARWOOD.