

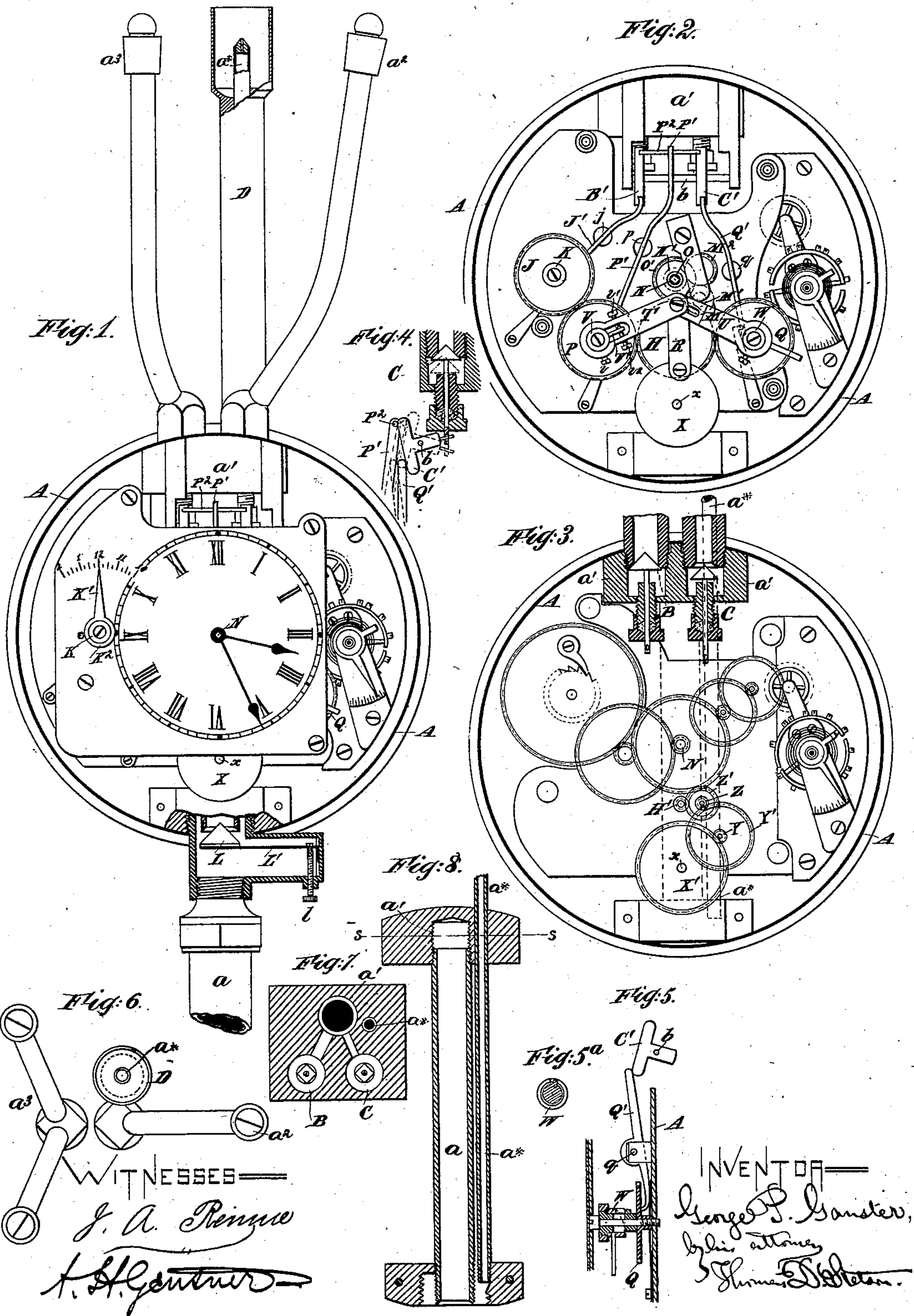
(No Model.)

G. P. GANSTER.

TIME MECHANISM FOR LIGHTING AND EXTINGUISHING
ILLUMINATING FLUIDS.

No. 289,826.

Patented Dec. 11, 1883.



UNITED STATES PATENT OFFICE.

GEORGE P. GANSTER, OF READING, PENNSYLVANIA.

TIME MECHANISM FOR LIGHTING AND EXTINGUISHING ILLUMINATING-FLUIDS.

SPECIFICATION forming part of Letters Patent No. 289,826, dated December 11, 1883.

Application filed January 2, 1883. (No model.)

To all whom it may concern:

Be it known that I, GEORGE P. GANSTER, of Reading, Berks county, in the State of Pennsylvania, have invented certain new and useful Improvements in Mechanism for Lighting and Extinguishing or Raising and Lowering Illuminating-Flames, of which the following is a specification.

I employ clock mechanism wound by hand or by any other suitable means, with provisions for automatically raising and lowering, which I term "lighting" and "extinguishing" the gas at certain periods, as determined by the clock mechanism, and for varying the periods of lighting and extinguishing, according to the time of year, to correspond with the varying lengths of the nights. I have in a patent to me dated March 12, 1878, No. 201,237, set forth a considerable portion of the mechanism employed; but the present invention goes further. I employ a cluster of lights in each lamp, all subject to a single clock mechanism. My improved mechanism ignites all the burners at night-fall. It extinguishes all but one at some intermediate hour, as midnight, and it extinguishes the remaining one in the morning. I have also introduced sundry improvements in the details, which will be set forth further on.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is a general front elevation of the entire apparatus with the front of the casing removed and certain portions shown in section. Fig. 2 is a corresponding view of the main case with the dial-plate and hands removed. Fig. 3 is a corresponding view with still further parts removed. The upper portion, containing the valves for the gas, is shown in section in this figure. The remaining figures show details detached. Fig. 4 is a section showing the principal parts. It is a section at right angles to that in Fig. 3. Fig. 5 is a corresponding section, showing some of the parts below. Fig. 5^a is a section at right angles to that in Figs. 4 and 5. Fig. 6 is a plan view of the burners. Fig. 7 is a horizon-

tal section on the line *s s* in Fig. 8. Fig. 8 is a vertical section through a portion. It shows the pipe which gives the main supply for use, shut off and let on by the mechanism, and also the small pipe which supplies the lighter, and through which the gas is allowed to flow continuously under all conditions.

Similar letters of reference indicate like parts in all the figures.

A is a fixed frame-work, and *a* a pipe from the street-main leading to a chamber, *a'*, from whence the gas flows, controlled by valves B and C. The gas which passes the valve C flows to a single burner, *a*², and produces an ordinary strong flame. The gas which passes the valve B flows to a cluster of burners, *a*³, and produces two or any other desired number of strong illuminating-flames. During the first part of the night both of the valves B and C are open. During the latter portion of the night the valve B is shut, and the gas only flows past the valve C to the burner *a*². In the morning the valve C is also closed, and no gas is admitted through the single burner *a*² or the cluster of burners *a*³; but a small flame is maintained through a small pipe, *a*^{*}, which connects with the pipe *a*, uncontrolled by any valve, and there is consequently a steady flame from the burner *a*^{*}. This should be a small flame, only sufficient to maintain itself during the day and stand ready to ignite the strong flames when they are let on at night.

In my said patent of March, 1878, I have described two wheels, P and Q, turned with a uniform motion, making one complete revolution in twenty-four hours, each wheel provided on the face with a pin or projection, which, as the wheel turns, traverses around in contact with an adjustable face-cam having a notch adapted to allow the pin, and consequently the entire wheel, to move forward when it is turned into the position corresponding thereto. The lever which operates a valve is pressed by the force of a spring against the inner face of the wheel, and gives the wheel a tendency to move outward, so as to perform this movement promptly when the notch is presented. As the wheel continues slowly revolving, the bevel of the notch afterward slides the wheel facewise or axially back-

ward or inward to its original position. One lever thus operated worked at the right time to induce the closing movement of the valve, and soon after returned to its inert position, leaving the valve shut, the other lever, operated by the other wheel and face-cam moved at night-fall to induce the opening movement of the valve and then returned to its inert condition, leaving the valve open. The valve moved with sufficient friction through its stuffing-box to retain the position in which it was left by the respective levers.

I use in the present invention a closely-corresponding set of mechanism; but to properly move the two valves obviously requires additional mechanism.

I employ three wheels and face-cams, the wheels all turning uniformly, each making one revolution in twenty-four hours. Two of the face-cams are harnessed together, and subject to the same automatic adjustment as is set forth in my said previous patent. This effects the motion for opening both valves at night and for closing the valve C in the morning. The face-cam which controls the intermediate shutting off of gas from a portion of the burner is not thus automatically changed. It will ordinarily not require changing; but I provide for changing it, if desired—as, for example, from twelve o'clock to eleven or one.

P and Q are the wheels corresponding to the similarly-designated wheels in my patent of March, 1878. The wheel P, controlled by its face-cam V, effects the opening movement. The wheel Q, controlled by its face-cam W, effects the closing movement of the last burner in the morning.

J is the additional twenty-four-hour wheel, and K is the face-cam therefor.

The original twenty-four-hour wheels P and Q receive their slow and uniform rotary motion from an intermediate twenty-four-hour wheel, H, mounted on a fixed stud, and revolved by the clock mechanism, as will be understood. The wheel H should be thick, so that the wheels P and Q may make a considerable axial movement in opening and closing the valves, while still remaining in gear. The wheel P should also be thick, so that the third twenty-four-hour wheel, J, may have a considerable axial movement independently of the axial movement of the wheel P, and still both remain reliably in gear. The levers by which the motions of these wheels are communicated to the respective valves is clearly shown in Figs. 2 and 5. The stems of the valves B and C are taken hold of by the horizontal arms of three-armed levers B' and C', one, at least, of which turns loosely on the axis *b*, so that they may have a motion independent of each other. The wheel P actuates a lever, P', turning on a fixed center, *p*, and carrying at its opposite end a cross-bar, P², so that a single movement of the lever P' acts on both the levers B' and C' to open both the valves B and C. This operation occurs on

the approach of evening, varying in this latitude from about five o'clock to eight, according to the season of the year.

The wheel J actuates a lever, J', turning on a fixed center, *j*, the other end of which lever acts on an arm of the lever B' to effect the closing motion of the valve B. This movement occurs at any predetermined hour when the night has so far advanced that there is less occasion for light than before. I will assume that it is at twelve midnight. The wheel Q actuates a lever, Q', turning on a fixed center, *q*, and acting on the lever C' in the direction to close the valve C. This movement occurs in the morning, varying in this latitude from four to seven o'clock.

The positions of the face-cams V and W, controlling the wheels P and Q, are changed automatically as the season advances by reason of the levers T and U, link R, and year-wheel X, in the same manner as set forth in the patent issued to me January 21, 1879, No. 211,505.

I provide means for adjusting the cam relatively to its operating-lever with great nicety. This is effected by providing an arm, V', on the cam V, which is received in a slot or cavity in the lever T considerably larger than the arm, so as to allow the arm V', and consequently the cam V, to be turned to a limited extent relatively to the lever T. The turning and adjusting are effected by screws *v'v*², which are tapped through the lever and press against the arm V' on its two faces. I employ an additional pinching-screw, *v*, in addition to the above means of adjusting. The pinching-screw performs the same function in this lever as in the other lever, U, to hold the cam very rigidly to the lever when it is adjusted.

The year-wheel X, which controls the levers T and U, receives its proper slow motion through a train of spur-gearing. The large wheel X' on the shaft *x* of the year-wheel engages with a pinion, Y. On the shaft of the latter is a large wheel, Y', which receives its motion from a pinion, Z. On the shaft of this latter is fixed a large wheel, Z', which engages with a pinion, H', on the shaft of the intermediate twenty-four-hour wheel. The motion is thus reliably communicated to the year-wheel with less friction than the previous worm motion, especially in intensely-cold weather when oils become stiffened, to which my clocks are especially subject by their exposure in street-lamps. This mechanism is also more cheaply constructed than the obliquely-toothed wheel or wheels and accurately-formed screw or screws required for the worm motion.

The cam K for the midnight-wheel J is set by an independent lever, K', which is on a sleeve, K², extended out through the face of the clock. It allows the hour of closing the valve B to be changed at will within wide limits without opening the clock or in any manner disturbing the other mechanism. These valves are what are known as "pup-

pet-valves," ground or otherwise accurately fitted in their seats. They close tightly and open and close with less friction than slide-valves. This is especially important in very cold weather, to which my clocks are exposed in street-lamps, and any lubricating-oil will become hardened.

I control the pressure of the gas so as to deliver with approximate uniformity when the valves are open and the gas is burning, even if the pressure in the street-main shall vary considerably. This is effected by a valve, L, which partially obstructs the passage, and is subject to a just sufficiently rigid spring, the tension of which may be adjusted with great delicacy by a screw, *l*. When this valve is rightly set, an increased pressure of the gas tending to make a too strong flame at each of the several burners is resisted almost perfectly by the yielding of the spring *L'*, and the consequent movement of the valve in the direction of the flow of the gas. This contracts the area of the passage for the gas, and induces an automatic equalization of the pressure at the several burners. It will be understood that on the occurrence of a reduced pressure of the gas the spring *L'* moves the valve *L* in opposition to the motion of the gas, so as to present a larger orifice.

The twenty-four-hour wheel *H* gets its motion from a pinion, *M'*. On the shaft of the latter is a larger wheel, *M*, which receives its motion from a pinion, *M''*, on the shaft *N* of the minute-hand, the latter, being turned with a reliable motion from the main wheel controlled by a good escapement properly regulated, turns with the proper uniformity once in an hour, and through the gearing described turns the twenty-four-hour wheel *H* once in twenty-four hours. I turn the ordinary twelve-hour sleeve and hand of the clock from this twenty-four-hour wheel by direct gearing thereto without the necessity of the ordinary spiral mechanism therefor. The sleeve of the hour-hand is marked *O*. The gear-wheel *O'* thereon receives motion directly from the twenty-four-hour wheel *H*.

D is a thick tube, of brass or other good conducting metal, inclosing the small burner *a**, and adapted to perform the double function of shielding the small flame from currents of air which might otherwise extinguish it, and

conducting downward the slight amount of heat from the constant small burner to maintain a moderate temperature in the clock-work in cold weather.

I claim as my invention—

1. The two puppet-valves *B* and *C*, with independent means of operating them automatically, in combination with the single supply-pipe *a*, chamber *a'*, and the two sets of burners *a²* *a³*, as herein specified.

2. The single lever *P'*, with its cross-piece *p'*, operated substantially as shown, in combination with the two levers *J'* and *Q'*, and two valves, *B* and *C*, so as to open both simultaneously, as herein specified.

3. In combination with the two sets of burners *a²* *a³* and the two controlling-valves *B* and *C* therefor, the three twenty-four-hour wheels, with their respective adjustable face-cams, as shown, with the gear-wheel and connections for controlling thereby the action of two of the three, as and for the purposes herein specified.

4. The constant small burner *a**, connected to the pipe *a* below the valves, in combination with the heavy tube *D*, extending downward to the framing *A*, arranged to perform the double function of shielding the small flame and conducting its heat to the clock-framing, as herein specified.

5. In a machine substantially as described, and in combination with the pipe *a*, the valve *L*, carried on the spring *L'*, and the screw *l*, for adjusting the force of said spring at will, as herein specified.

6. The intermediate twenty-four-hour wheel *H*, driven by direct gearing, as shown, in combination with the wheels *P* and *Q* and connected mechanism for opening and closing one or more valves, and with the sleeve *O*, driving the twelve-hour wheel by gearing direct from the twenty-four-hour wheel, as herein specified.

In testimony whereof I have hereunto set my hand, at New York city, this 29th day of December, 1882, in the presence of two subscribing witnesses.

GEORGE P. GANSTER.

Witnesses:

M. F. BOYLE,
J. A. REMISE.