No. 897,981. PATENTED SEPT. 8, 1908.

J. C. F. JÜRGENS.

DEVICE FOR PRODUCING INTERMITTING LIGHT.

APPLICATION FILED SEPT. 10, 1907. 2 SHEETS—SHEET 1.

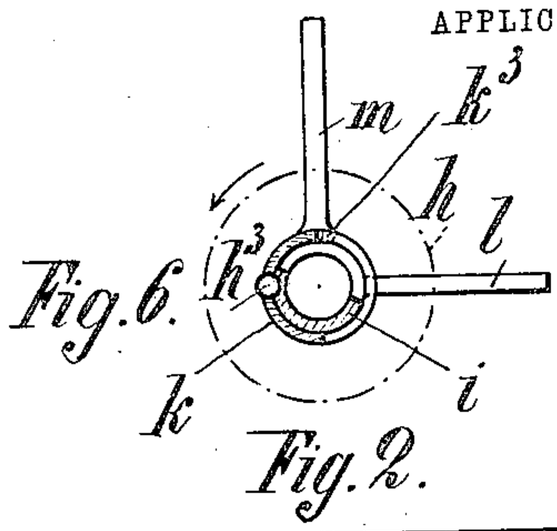

Fig. 6.

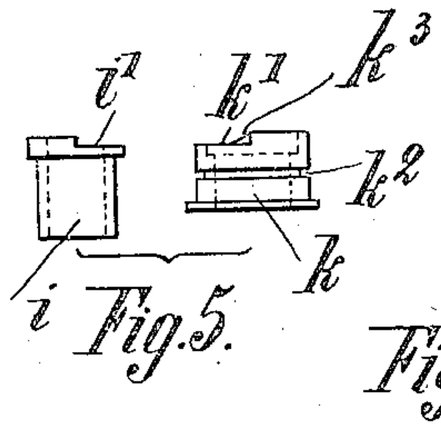

Fig. 5.

Fig. 2.

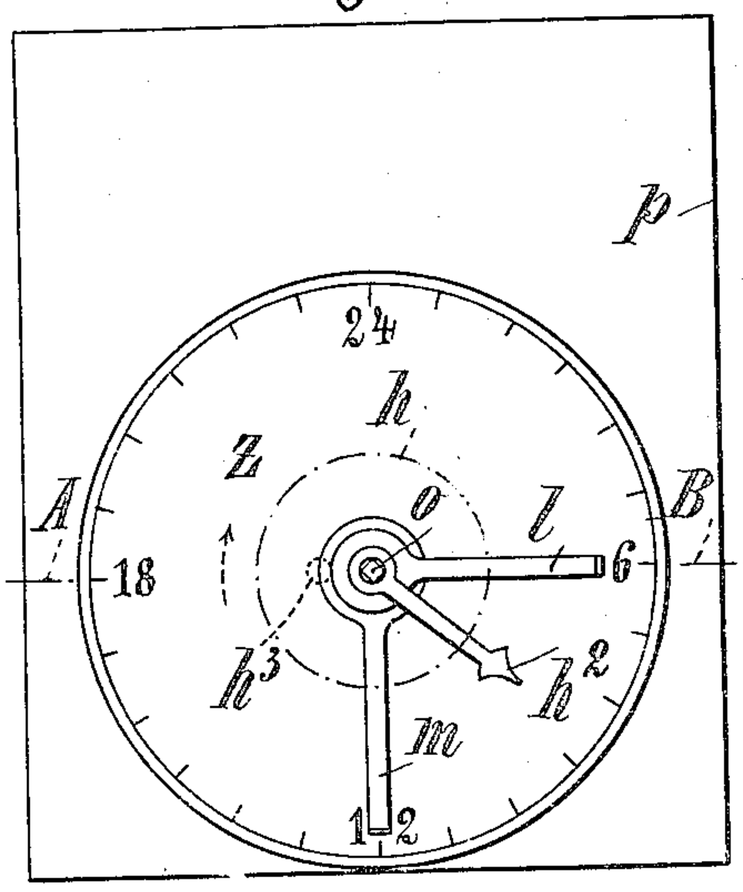

Fig. 1.

Fig. 4.

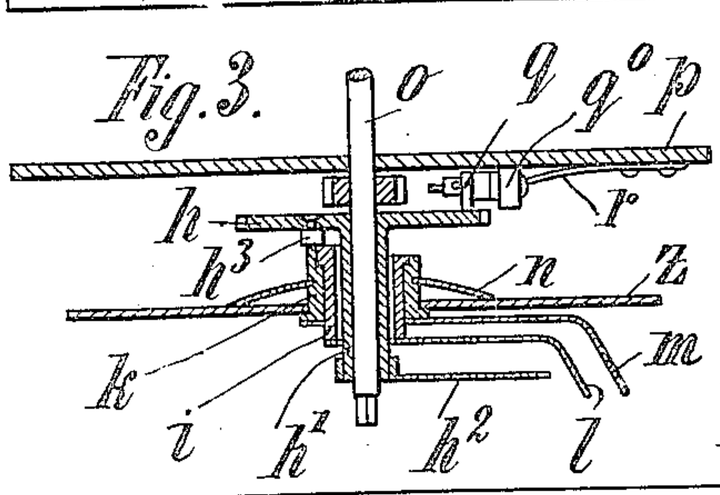

Fig. 3.

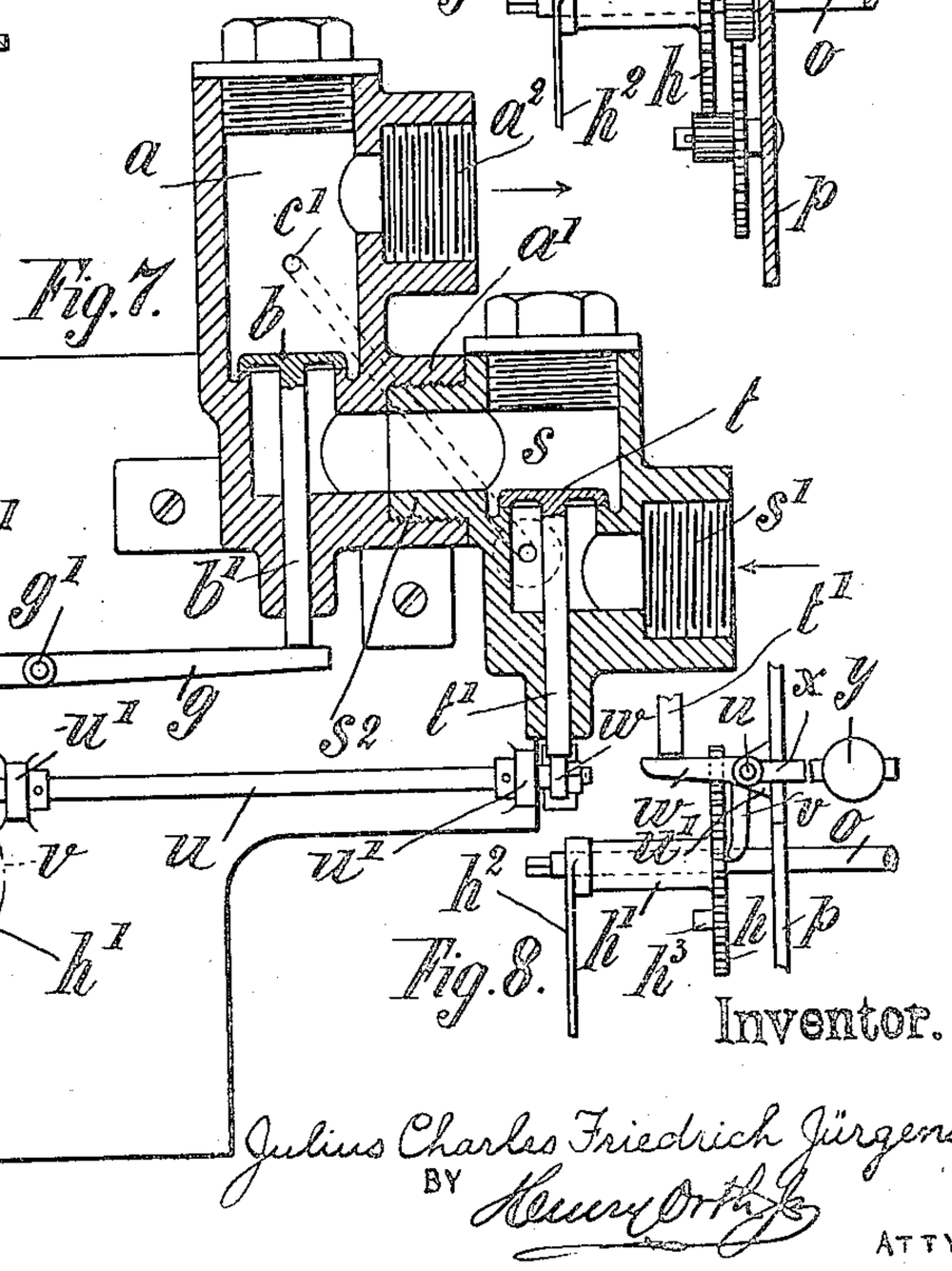

Fig. 7.

Fig. 8.

Witnesses.

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DEVICE FOR PRODUCING INTERMITTING LIGHT.

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Fig. 9.

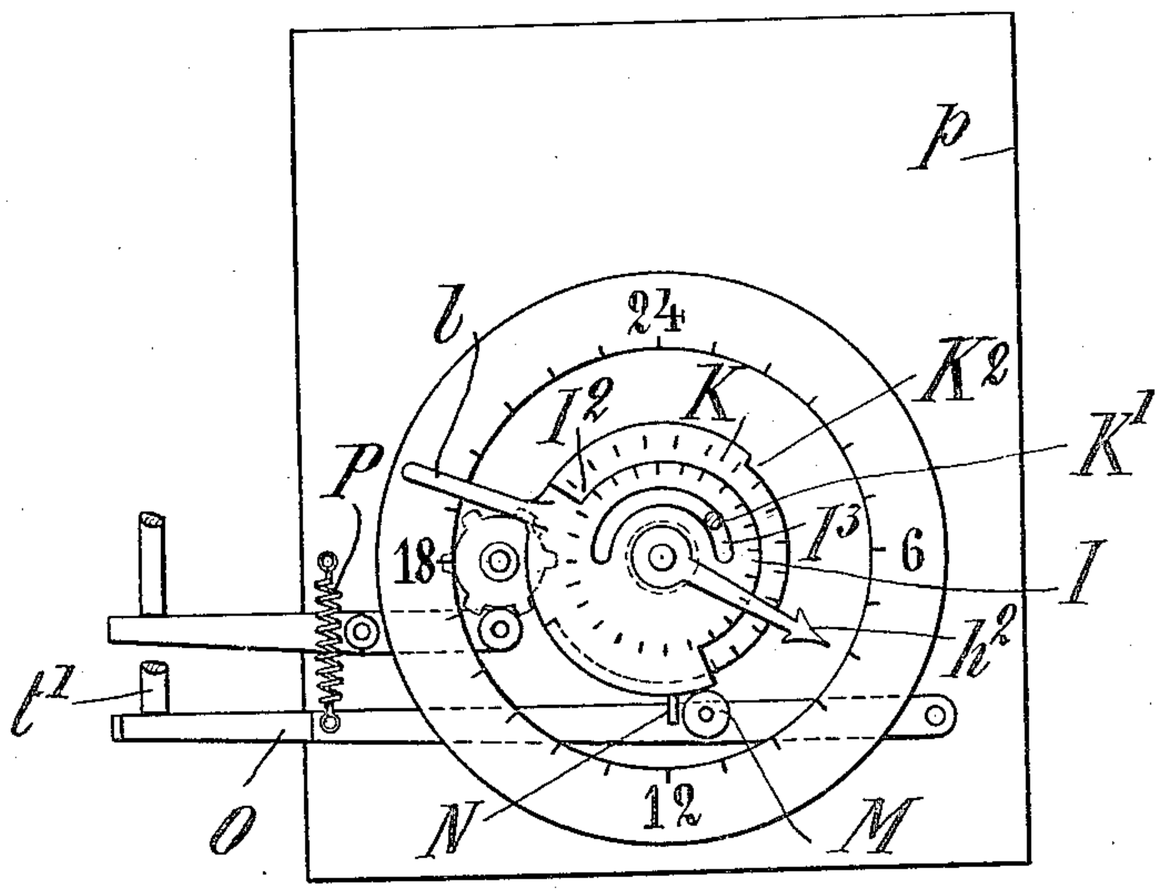


Fig. 10.

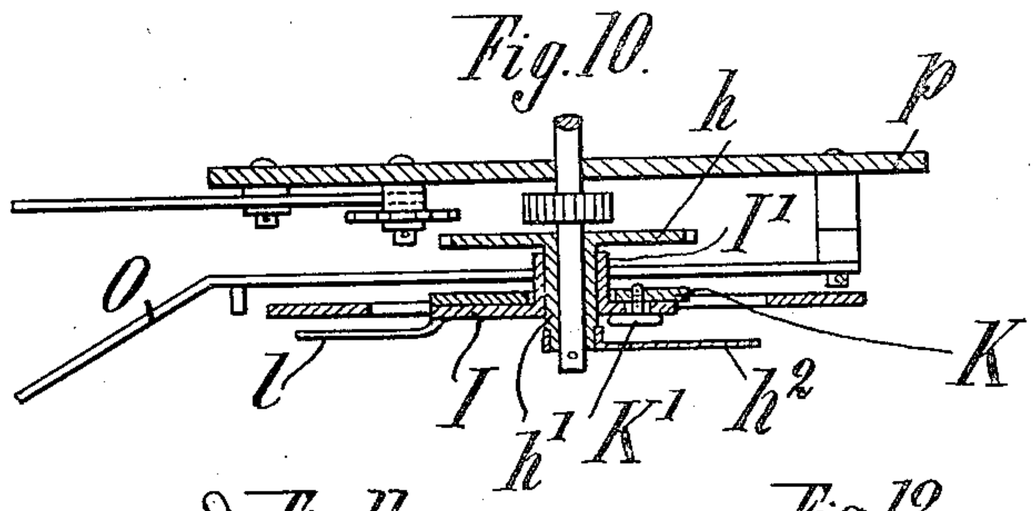


Fig. 11.

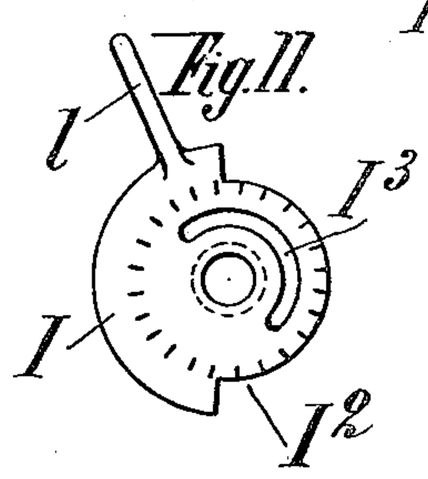
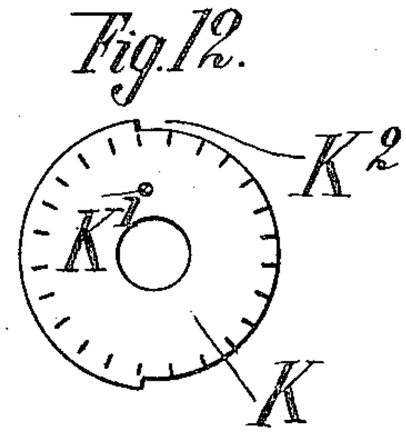


Fig. 12.



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UNITED STATES PATENT OFFICE.

JULIUS CHARLES FRIEDRICH JÜRGENS, OF HAMBURG, GERMANY, ASSIGNOR TO RUDOLPH GUSTAV WITT, OF HAMBURG, GERMANY.

DEVICE FOR PRODUCING INTERMITTING LIGHT.

No. 897,981. Specification of Letters Patent. Patented Sept. 8, 1908.

Application filed September 10, 1907. Serial No. 392,177.

To all whom it may concern:

Be it known that I, JULIUS CHARLES FRIEDRICH JÜRGENS, a subject of the Emperor of Germany, and resident of Hamburg, in the German Empire, have invented a certain new and useful Device for Producing Intermitting Light, of which the following is a specification.

This invention relates to a device for producing intermitting light and more particularly for producing intermitting light in gas-lamps. This object in view the device is so constructed that by the aid of the same the feed of the gas to one or more burners is, in regular intervals, either interrupted completely or diminished to such an extent, that the gas is merely sufficient to feed a small igniting flame. At the end of each interruption or throttling of the gas-feed, the gas-pipe is again completely opened and the flame flushes up again or the gas is ignited by the small igniting flame. Thus eclipses and light flashes are obtained alternately in regular intervals as long as the device is allowed to operate. This device may be used in connection with a controller for automatically setting it in operation and stopping its operation after a predetermined period.

In the drawings similar letters refer to similar parts.

Figure 1 shows a vertical section of the device for producing intermitting light in connection with a clockwork and an automatic controller. Fig. 2 is a front view of the clockwork having adjustable starting and stopping hands for the controller. Fig. 3 is a horizontal section drawn to the line A—B of Fig. 2, and Fig. 4 is a vertical section drawn to the line C—D of Fig. 1. Fig. 5 shows tubular cams in a side-view used in the controller and Fig. 6 shows a sectional end-view of the same in a position at an angle of 180° to that shown in Fig. 2. Fig. 7 is a vertical section of a modification and Fig. 8 shows part of the modified controller belonging thereto. Fig. 9 shows another modification in front elevation and Fig. 10 in horizontal section. Figs. 11 and 12 show cam-disks used in connection with this modification.

Referring to Figs. 1–6 a chamber *a* is arranged within the gas-conduit, the main or feed pipe of which is connected to the chamber *a* by its socket a^1 and the pipe leading to the burner by the socket a^2. A valve *b* within the chamber *a* shuts off the stream of gas, when on its seat. The space below the valve is in connection with the space above the valve by a small tube *c*, the cross-section of its passage being adjustable by a set screw *d*, projecting into this tube. Through this tube *c* a certain amount of gas may flow continuously into the pipe leading to the burner. Thus even when the valve *b* is down on its seat, the flame can not extinguish completely but a small flame still remains. If desired the tube *c* may lead directly to the burner instead of into the space above the valve, so as to create a continuously burning igniting flame close to the burner. In any case the small flame ignites the large illuminating flame as soon as the valve *b* is lifted from its seat. By opening and closing the valve *b* at longer or shorter intervals the flash lights may be made to appear and disappear quicker or slower at will, which is of importance for advertising purposes. Instead of making use of the tube *c* the valve *b* may be provided with a small opening or may be otherwise arranged to allow a small amount of gas to pass when down on its seat.

The opening and closing of the valve may be advantageously regulated by a clockwork. In the apparatus shown the shaft *e* of the hand showing the seconds carries a disk *f* provided with one or more cams f^1, the number of which and the distribution of the same depending on the frequency and the speed with which the flashes of light are to follow one another. A lever *g*, which is pivoted to the frame at g^1, bears against the disk *f* with one end and with the other end against the spindle b^1 of the valve *b*. Whenever a cam f^1 of the disk *f* during its rotation hits the lever *g*, the latter is so oscillated that the spindle b^1 is raised and the valve *b* is lifted from off its seat, thus allowing gas to pass the valve, and a flash of light appears. In the apparatus shown the disk *f*, carried by the second-shaft *e*, is provided with eight cams; thus eight flashes of light will be created in the minute.

When it is desired to allow flashes of light to appear merely during a certain part of the day for instance, only at night or evening an automatic controller is made use of, which in the apparatus shown in Figs. 1 to 6 consists of the following parts. On the hollow boss h^1 of the hour-gear *h*, carrying at its end the short or hour-hand h^2 there is a sleeve *i* and on the latter a second sleeve *k*, both being loose and only held by friction, and at their

forward ends provided with hands l and m respectively. To increase the friction by which these sleeves are prevented from unintentional movement, a spring n is provided for, which is held in a circular notch k^2 Figs. 3 and 5 and bears against the back of the dial z. For clearness sake the hands l and m are shown in Fig. 2 standing at right angles to each other and in Fig. 3 one over the other. Also for clearness sake the sleeves are omitted in Figs. 1 and 4.

As is usual in alarm-clocks the hour-gear h, slidably arranged on the shaft o, is provided with a stud h^3, which in the present instance bears with its face against the rear edge of the sleeves i and k, Fig. 6. A lever q having its pivot q^1 on a lug q^0 of the frame or plate p bears with one end against the back-face of the hour-gear h and by aid of the spring r attached to the plate p has the tendency to push the hour-gear h outwardly thus pressing the stud h^3 tightly against the edges of the sleeves i and k.

The sleeves i and k are provided at their rear edge with a gap i^1 and k^1 respectively running round about half the circumference of the sleeves, Fig. 5, thus forming cams on which the stud h^3 rides. One end of the gap k^1 on the sleeve k is not abrupt, as the other ends of these gaps are, but is slanting so as to allow the stud h^3 to pass from the lower part to the higher part of the cam. The sleeves are generally so adjusted that parts of their gaps coincide, thus allowing for a lower part of the cam, on which the stud can descend during the rotation of the hour-gear h. Hereby the hour-gear slides outwardly on the shaft o and at the same time the lever q oscillates on its pivot q^1. The upper end q^2 of this lever is bifurcated and engages a circular notch in the boss f^2 of the cam-disk f, so as to move this disk into operative position opposite the lever g, when the hour-gear h is moved outwardly as described. When in such position the cams f^1 on he disk f create an oscillating movement of the lever g and the valve b opens at intervals as described above. The operation continues until the sloping end of the gap k^1 contacts with the stud h^3 to lift it on the higher part of the cam, and to move the hour-gear backwards again. The lever q hereby is also against the action of the spring r returned to its former position and it draws the cam-disk f away from the lever g, allowing the valve b to close down on its seat. The flashes of light therefore cease. The controller may be adjusted by turning the sleeves i and k by their hand l and m to any desired position with regard to the dial correspondingly to the time the flashes of light are to commence and to cease.

It is only necessary as a rule to allow the device to work a comparatively short time during 24 hours and not every 12 hours. The best way to this end, is to employ a dial with 24 hours (Fig. 2) and to allow the hour-gear to make only one revolution during 24 hours.

In the modification shown in Figs. 7 and 8 besides the chamber a with valve b, there is a second chamber s, having a similar valve t. The chamber s is attached to the chamber a by a socket s^2 screwing in to the socket a^1 and to the main or feed pipe by a socket s^1. The space below the valve t is connected with the space above the valve b by the small tube c^1. In this modification the cam-disk f is continuously acting on the lever g, so that the valve is always opening and closing, no matter whether the valve t is open or shut. In order to open the valve t at a certain time of the day and to close the same some time later on, the shifting of the hour-gear h as described above may be made use of. To this end a rock shaft u is journaled in lugs u^1 attached to the plate p of the frame, which shaft is provided with three arms or levers v, w and x. The arm v bears against the back face of the hour-gear h and the arm w against the end of the spindle t^1 of the valve t and the lever x is provided with a weight y, the tendency of which is to raise the arm w and therefore also the valve t. When the stud h^3 descends into the gap i^1 k^1 to the lower part of the cam on the sleeves i and k, which for clearness sake are not shown in Figs. 7 and 8, the gear h gives way to the pressure of the arm v and the shaft u rocks to open the valve t. As long as this valve t is open gas may pass to the valve b, which by its up and down motion shuts off the flow of gas in short intervals. An intermitting light will be thus produced. When the stud h^3 rides up the higher part of the cam the hour-gear h returns to its former position and also forces the arm v to the right, Fig. 8, against the action of the weight y. The arm w hereby lowers and the valve t closes down on its seat to shut off the gas. The gas will remain shut off as long as the stud h^3 rides on the higher part of the cam. During this time a small igniting flame will be kept up by the tube c^1.

In the modification shown in Figs. 9–12 the sleeves carrying the cam to operate the controller are replaced by disks. On the boss h^1 of the hour-gear h there is a disk I loosely arranged, held merely by friction and provided with a hand l and behind this disk there is a second disk K, which is adapted to be pressed against the disk K by a screw K^1, screwed into the disk K and projecting through an arched slot I^3 in the disk I. Both disks I and K are provided on their rims with a gap I^2 and K^2 respectively, so that the remaining parts form a lifting cam. The disks carry division-lines to indicate units of time, which on the disk K are made visible by making the gap on the disk I deeper than on the disk K. A roller M and a pin N, both

arranged on an oscillating lever O, are adapted to bear on the rim of the disks or the cam. This lever which is pivoted to the frame or plate *p*, hangs on a spring P, which tends to raise the lever against the spindle t^1 of the valve *t*. When the disks I and K are so adjusted that their gaps coincide or partly coincide, the lever O will be raised upwards as soon as the gap presents itself to the pin N and the roller M, thus opening the valve. When there is no second valve *t* the lever O may be so constructed as to shift the cam *f*, as is described above with reference to lever *q*. Instead of making use of both parts N and M, only the pin N or the roller M may be made use of. The employment of the pin N has the advantage, that the dropping down into the gap and therefore the commencement of intermitting light takes place suddenly, to which purpose also ends of the gaps are abrupt or cut off radially. The roller allows of a smooth sliding-up the higher part of the cam. When there is no roller the end of the gap K must be gradually slanting.

In a clockwork of which the hour-gear makes one revolution every 12 hours, the controller must be held idle during 12 hours of the day, by suitable means.

I claim:

1. In a device for producing intermitting light, a gas conduit and a valve therein, in combination with a clock mechanism, valve actuating means operable by the clock mechanism, and means to periodically control said actuating means operated by the hour gear of said mechanism.

2. In a device for producing intermitting light, a gas conduit and a valve therein, in combination with a clock mechanism, means operated by the latter to continuously reciprocate the valve, a controlling valve, and means operated by the clock mechanism to periodically actuate the controlling valve.

3. In a device for producing intermitting light, a gas conduit, a valve therein, and cams to open and close the valve, in combination with a clock mechanism to operate the cams, and cams adjustable on the hour gear arbor to control the valve operating means.

4. In a device for producing intermitting light, a gas conduit, a valve therein and cams to open and close the valve, in combination with a clock mechanism to operate the valve, cams adjustable on the arbor of the hour gear, a controlling valve in the gas conduit, and means operated by the adjustable cams to periodically actuate the controlling valve.

5. In a device for producing intermitting light, a gas conduit and a valve therein, in combination with a clock mechanism, means actuated by the latter to open and close the valve, adjustable cams, an hour-gear slidably mounted on its shaft controlled by said cams, a controlling valve mounted in the conduit and means operated by the sliding of the hour gear to actuate the controlling valve.

6. In a device for producing intermitting light, a gas conduit and a valve therein, in combination with a clock mechanism, means actuated by the latter to open and close the valve, adjustable cams, an hour-gear slidable on its shaft, a stud on the hour-gear engaging the cams, a pivoted arm, a second valve connected with the latter, and means controlled by the sliding of the hour gear to actuate the arm.

7. In a device for producing intermitting light, a gas conduit and a valve therein, in combination with a clock mechanism, means actuated by the latter to open and close the valve, adjustable sleeves having cam faces formed on their ends, an hour gear arbor slidable in the sleeves having a stud in engagement with the cams, a second valve in the gas conduit, a rock shaft, an arm on the latter bearing on the hour gear, and an arm on the shaft connected with the second valve.

8. In a device for producing intermitting light, a gas conduit, a valve therein, a valve stem projecting from the conduit, and a rocking lever having one end engaging the stem, in combination with a clock mechanism, cams adapted to rock the lever, adjustable sleeves forming a bearing for the hour-hand arbor, a stud on the hour-hand gear engaging cam faces formed on the inner ends of said sleeves, a rock shaft, an arm on the latter in contact with the gear, a controlling valve in the conduit, an arm on the shaft connected with the controlling valve and a counterweight on the shaft to rotate the same.

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Witnesses:
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ERNEST H. L. MUMMENHOFF.