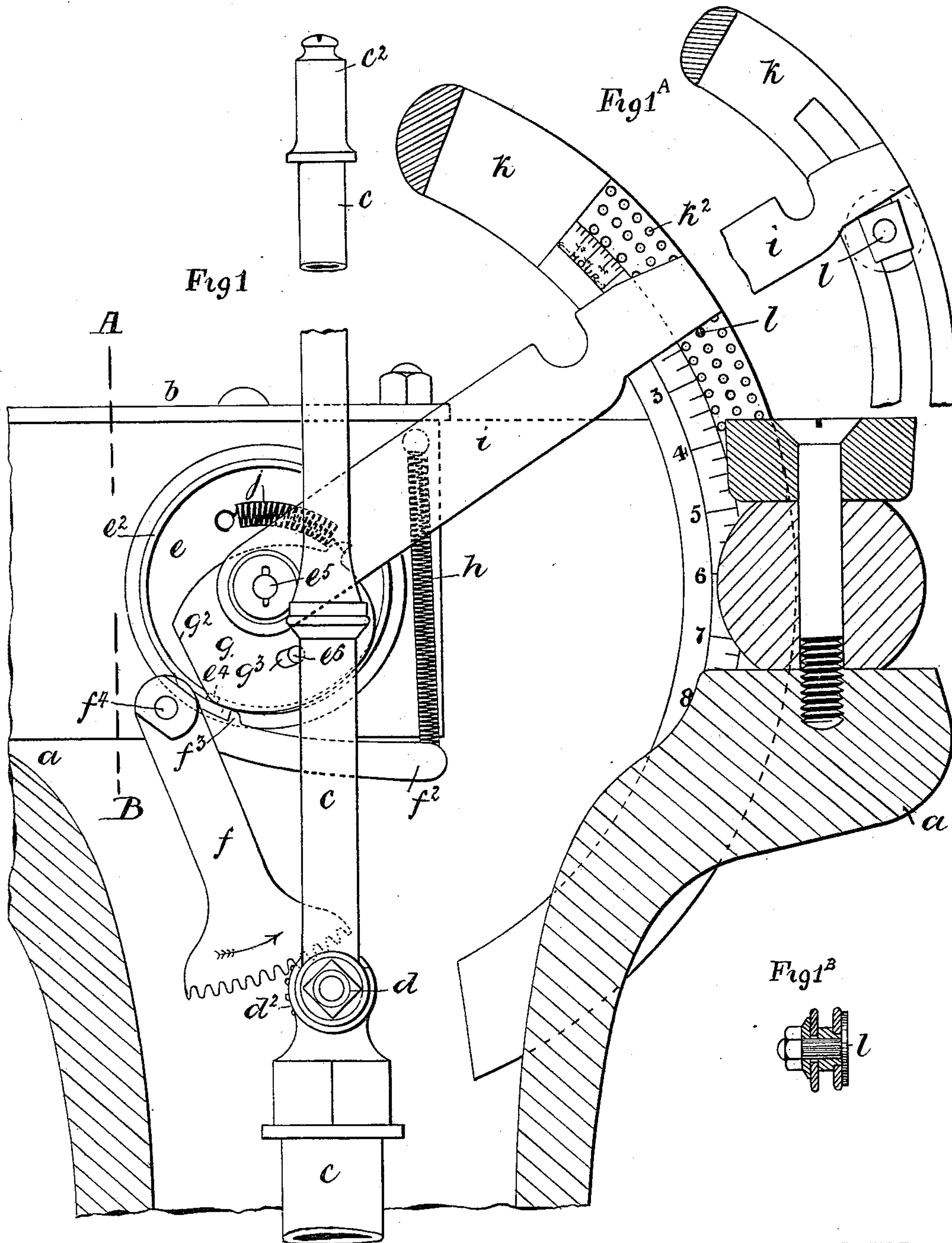


(No Model.)

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J. S. EDGE & F. W. TICEHURST.
AUTOMATIC AND INSTANTANEOUS GAS LAMP EXTINGUISHER.
No. 403,654. Patented May 21, 1889.



WITNESSES.

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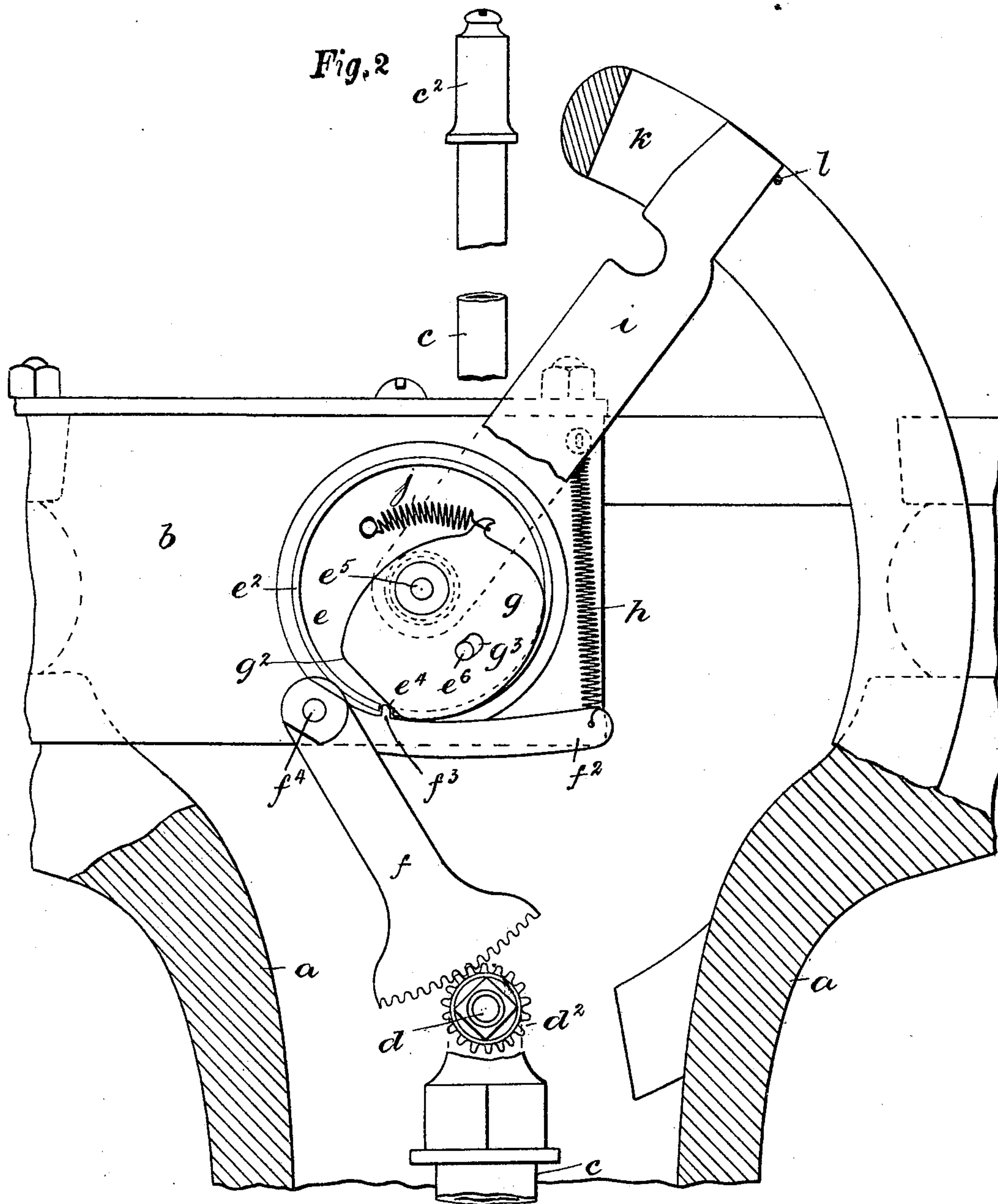
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Fig. 5

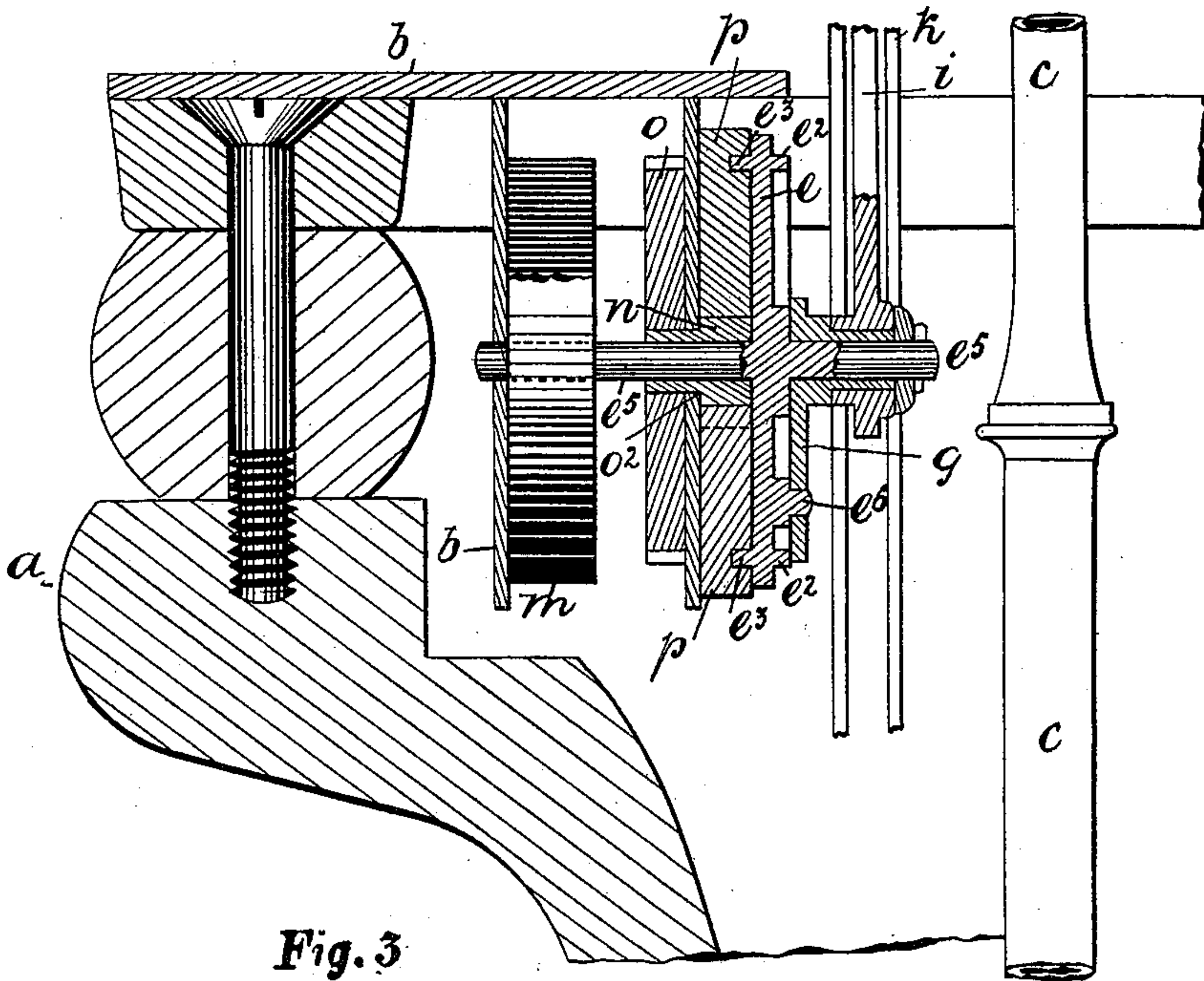
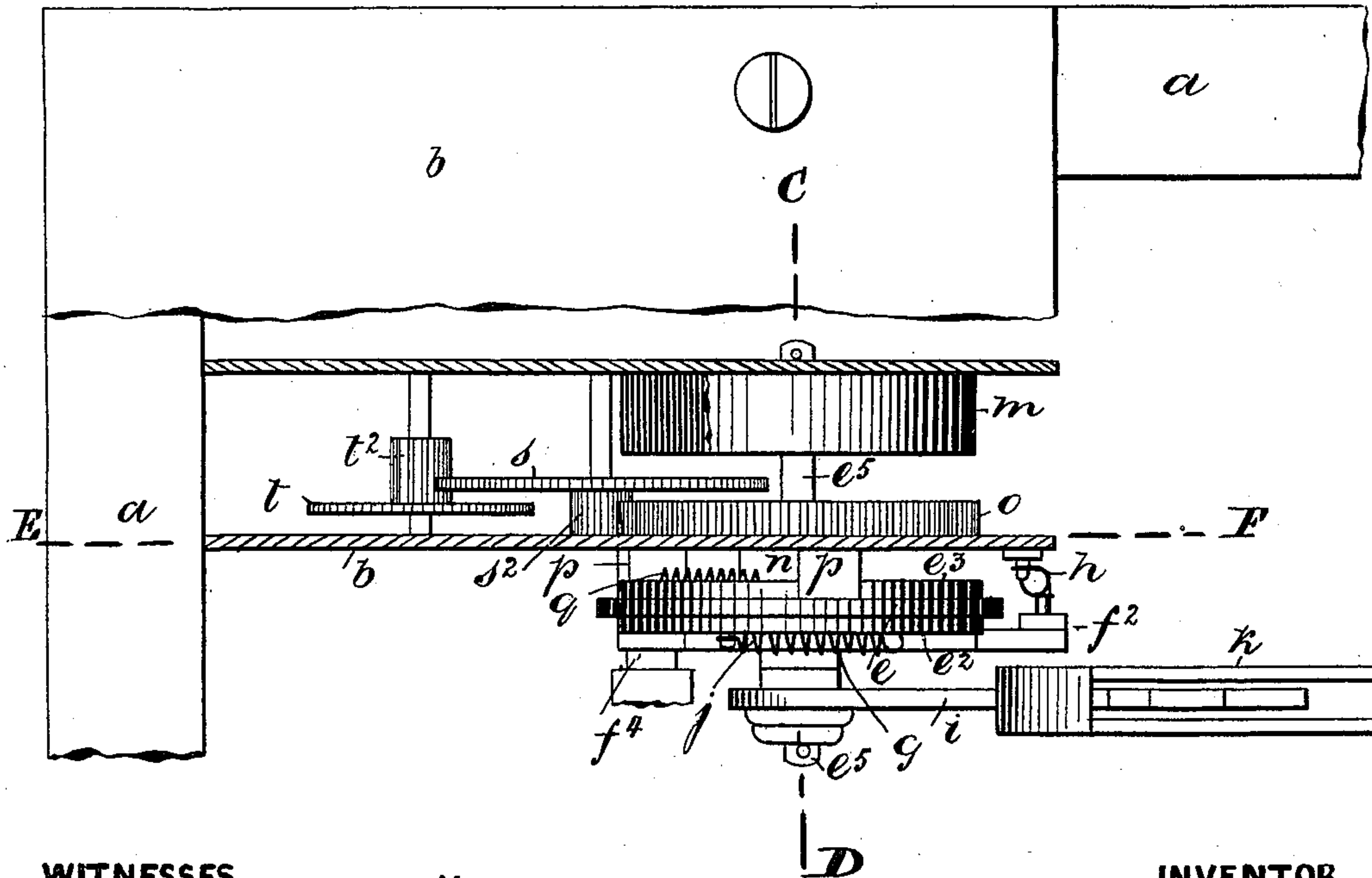


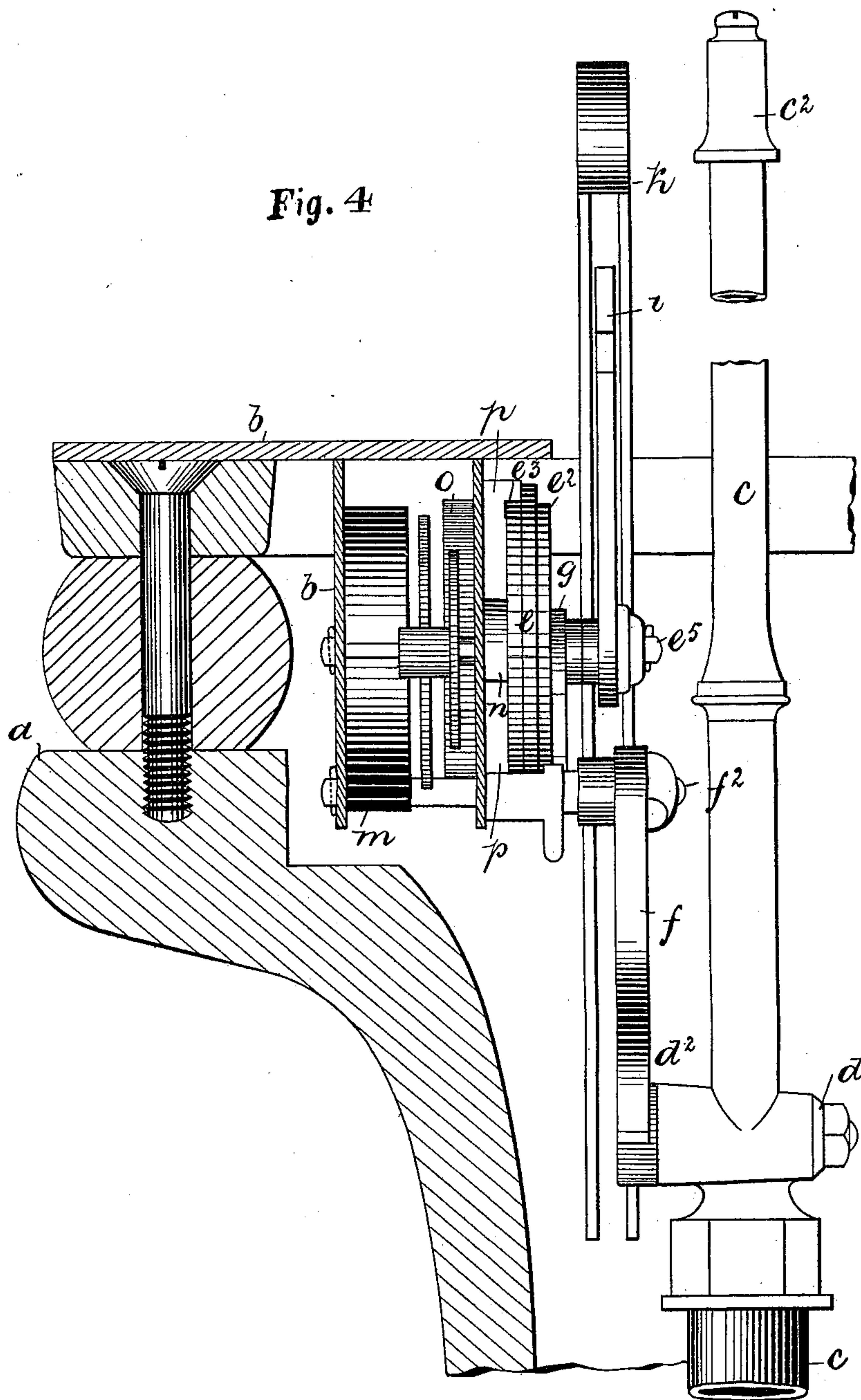
Fig. 3



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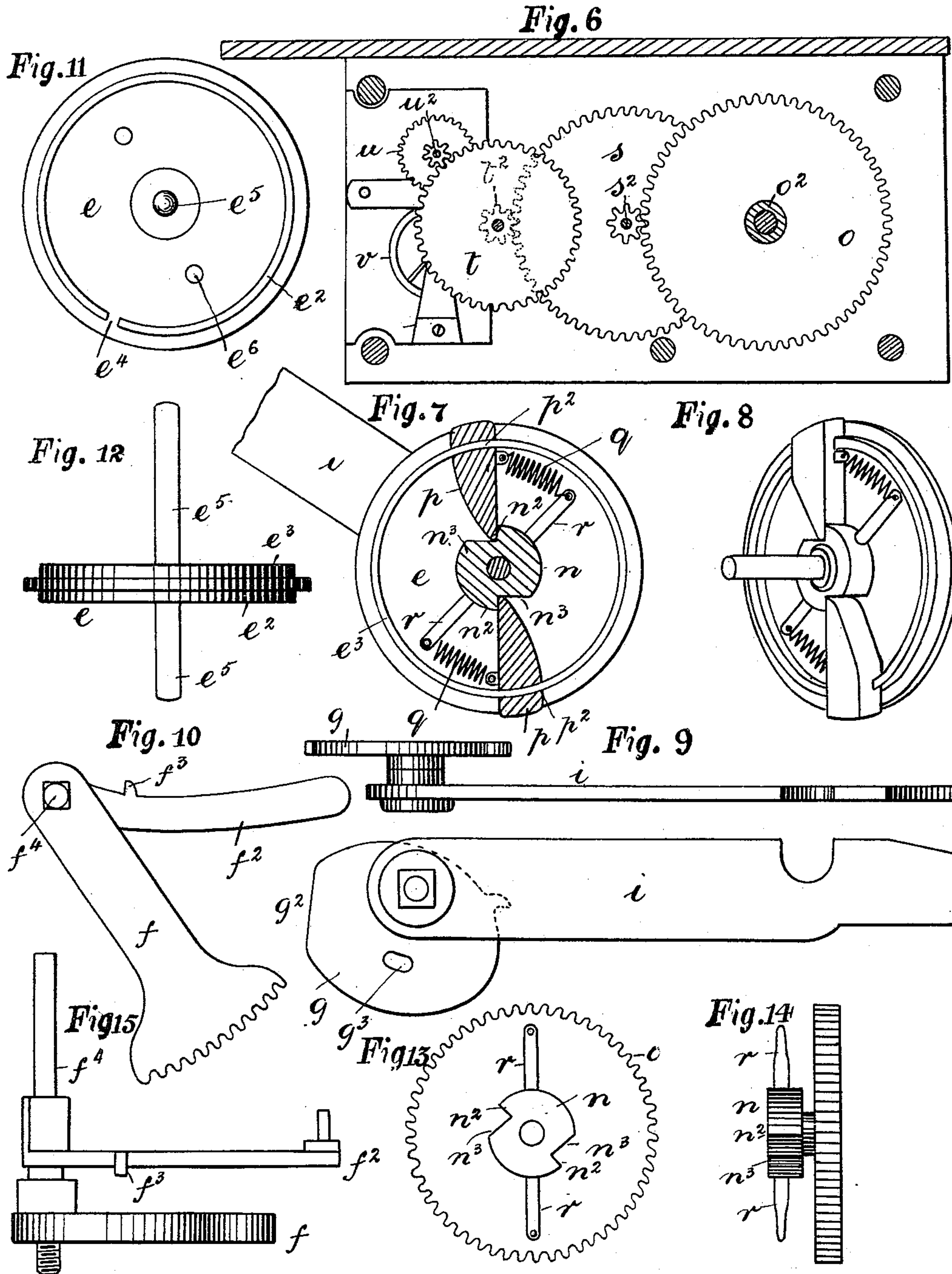
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UNITED STATES PATENT OFFICE.

JAMES SIMEON EDGE AND FRANCIS WILLIAM TICEHURST, OF BIRMINGHAM,
COUNTY OF WARWICK, ENGLAND.

AUTOMATIC AND INSTANTANEOUS GAS-LAMP EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 403,654, dated May 21, 1889.

Application filed May 16, 1888. Serial No. 274,089. (No model.) Patented in England October 15, 1886, No. 13,197; in France October 12, 1887, No. 186,369, and in Germany October 27, 1887, No. 13,571.

To all whom it may concern:

Be it known that we, JAMES SIMEON EDGE, manufacturer, residing at Coleshill Street, Birmingham, in the county of Warwick, England, and FRANCIS WILLIAM TICEHURST, agent, residing at Edmund Street, Birmingham, in the county of Warwick, England, have invented a certain new and useful Automatic and Instantaneous Gas-Lamp Extinguisher, (for which Letters Patent have been granted as follows: Great Britain, dated October 15, 1886, No. 13,197; France, dated October 12, 1887, No. 186,369, and Germany, dated October 27, 1887, initial No. 13,571;) and we do hereby declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to mechanism or means for cutting off the gas-supply of gas-lamps and for the instantaneous and automatic extinguishing of the flame.

The invention consists in the novel construction and combination of parts hereinafter described and specifically claimed.

Figure 1 represents, partly in elevation and partly in vertical section, the supporting-framing of the lantern of an ordinary street-lamp provided or fitted with automatic time extinguishing mechanism constructed and arranged according to this invention, and which said automatic time extinguishing mechanism is represented at work or in action and the gas-lamp lighted. Fig. 2 represents a like sectional view as Fig. 1, but with the time extinguishing mechanism in a position which it assumes when the lamp is or has been extinguished after the lapse of a certain chronometric period of time. Fig. 3 represents a plan of the upper side of the said mechanism and with the lantern-supporting framing partly broken off and the covering-plate partly broken away. The mechanism is inclosed within a metallic case or covering (not shown) to protect the movements or parts from atmospheric influences and wet. Fig. 4 represents an end elevation of the parts of the said time extinguishing mechanism and with the lantern-framing shown in section and upon the dotted lines A B, Fig. 1. This end view

is taken from the side on which the toothed quadrant is situated. Fig. 5 shows a nearly complete vertical section of the said mechanism and taken upon the dotted lines C D, Fig. 3, looking from the left-hand side of the lantern-framing. Fig. 6 represents an elevation with some of the parts in section of the horological or time mechanism. This view is taken upon the dotted lines E F of the said Fig. 3. Fig. 7 exhibits the time-wheel and clutch mechanism, the former being shown in elevation, while the latter is shown in vertical section and taken through the grooves or gripping parts, which ride freely upon the rim of the time-wheel when the main actuating-lever is depressed for winding. Fig. 8 is a perspective view of the preceding figure, which shows more clearly how the clutch-arms engage with the rim and boss, respectively. Fig. 9 shows in front and side elevation the main actuating-lever, while the other figures, 10, 11, 12, 13, 14, and 15, show the other principal parts of the said extinguishing mechanism.

The same letters of reference indicate corresponding parts in the several figures.

a is the upper part or head-supporting framing of the lantern of an ordinary street-lamp.

b is the supporting-frame of the time extinguishing mechanism.

c is a gas-pipe passing vertically upward through the middle or hollow of the lamp-post and with the nipple end *c*² disposed within the lantern. The gas-pipe is broken off at top and middle parts and is provided with an ordinary gas plug or cock, *d*, which is turned by the teeth of a toothed quadrant, as hereinafter described, engaging with the teeth of a pinion, *d*², on the end of the axis of the said plug *d*.

e is a time-wheel, consisting of a plain wheel or disk having upon its two opposite faces and near its outer edge or periphery concentrically-disposed flanges or rims, as best seen in the sectional views and in the separate view, Fig. 12. These rims are marked *e*² and *e*³, respectively, of which *e*² is the outer and *e*³ is the inner, and it is upon the latter, *e*³, that the clutches lock themselves, while the former has a notch or gap, *e*⁴, cut

or made therethrough, and wherein a tooth or projection, f^3 , of a quadrant-arm, f^2 , engages and falls on the tooth and gap becoming coincident, which takes place on the time-wheel
 5 having performed its allotted motion or movement equivalent to certain predetermined chronometric units. The arm f^2 is carried by or is made in one piece with a toothed quadrant, f , so that on the tooth which is held up
 10 to the rim of the time-wheel (by a spring, h) coming opposite the gap, as aforesaid, the said tooth drops therein and makes the toothed quadrant f turn outwardly, as indicated by the arrow. The upward movement thus cre-
 15 ated in the quadrant-arm rotates the plug d and cuts off the gas by the teeth of the said quadrant engaging with the teeth of the plug-wheel. The spring for giving the necessary motion is marked h , while the joint upon
 20 which the quadrant turns is marked f^4 .

In front of the time-wheel and threaded upon the time-wheel axis e^5 (which is a fixture with the time-wheel) is a cam-plate, g , whose sole function is to remove the tooth f^3 from
 25 the gap e^4 in the time-wheel on the winding up of the clock mechanism and the setting or putting back of the time-wheel. This cam-plate is a flat plate with an incline or an inclined plane, g^2 , upon its front edge, and a
 30 bushed middle, by means of which latter the main operating-lever i is thereto connected. The lower part of the inclined or cut-away part g^2 , as aforesaid, comes in front of or partially covers up the gap when the apparatus
 35 is in action, as represented in Fig. 1; but on the tooth coming coincident with the gap the cam-plate is moved back to an extent equal to the length of the slot g^3 , wherethrough a stud, e^6 , on the face of the time-wheel e passes.
 40 In Fig. 2 the incline is shown in position ready for pressing the tooth out of the gap by the downward movement of the lever i , and which said view also shows the stud e^6 at the other end of the slot. This change of posi-
 45 tion of the cam-plate compresses the spring j , which is secured to the cam-plate and to the time-wheel, respectively. Thus the passing of the tooth into the gap on the latter coming in front of the former gives a slight back
 50 movement to the cam-plate and actuating-lever; but on the forward movement of the actuating-lever i the time-wheel, cam-plate, and winding-up parts connected with the axis move together, so that the cam-plate can
 55 in one direction take an independent movement of the time-wheel—that is, during the period the tooth is being removed from the notch or gap on the descent of the main operating-lever; but after the tooth's removal
 60 by the angular movement made by the incline, as aforesaid, then the cam-plate and time-wheel move together by the pin on the face of the one coming against one end of the short slot in the other.

65 k is a time-plate pierced with graduated holes k^2 , and having inscribed upon the other

side a graduated scale marked off with points indicative or equivalents of the holes.

l is a stop, in the form of a peg, which is placed in either one or other of the holes, and
 70 whose position determines the extent of motion which shall be allotted to the time-wheel and main lever.

Figure 1^A shows a modified form of time-plate, dispensing with the use of holes and a
 75 peg, and employing in their stead a plate slotted about its middle, and wherein an adjustable stop (marked l) works. It consists simply of a clamping device, which on being
 80 screwed up is secured between the back and front faces of the plate, as best seen in Fig. 1^B. To adjust the same to any required position with respect to the graduated scale, simply relax the grip by turning the nut, when
 85 the stop's position can be changed or readjusted. The time-wheel axis is secured at its inner end to an evolved or involute spring, m , which is the motive power employed for working the apparatus.

Mounted loosely upon the time-wheel axis
 90 e^5 is a combined circular boss, n , and a toothed wheel, o , the former having cut within its periphery or edge opposite angular cut-away parts n^2n^3 , and said boss and toothed wheel are
 95 connected rigidly together by a neck, o^2 . The sides n^2 are directed in the direction of the diameter of the time-wheel and boss, while the other sides, n^3 , are inclined, and it is against the straight shoulders n^2 that the in-
 100 side ends of clutches p abut when the time-wheel and other parts move together. The clutches p have semicircular grooves p^2 near their outer inside faces, which work upon and grip the inside flanges, e^3 , of the time-wheel
 105 when the apparatus is going, or when the parts are returned to their normal positions after having been set. The grooves p^2 of the clutches p are kept concentric or parallel to the flange upon which they work by coiled
 110 springs q , distended in opposite directions between clutches and carrying arms r , which latter proceed from the outer edge of the boss
 115 n . Thus when the main actuating-lever is depressed the clock mechanism, as hereinafter described, is required to be disconnected for a time from the driving-power and the means which wind up the driving-power. This is done by the springs pulling the straight
 120 faces of the clutches and their radial grooves, which are struck from them, parallel to their abutment shoulders and rim, which thereby allows the said rim to move free of the gripping-edges and the time-wheel to move independent of the clutch mechanism.

The clock mechanism, as best seen in Fig.
 125 6, consists, essentially, of a toothed wheel, o , and neck o^2 , which connects it with the clutch-boss. This wheel gears with the pinion s^2 , carried by a toothed wheel, s , which gears with a pinion, t^2 , on the axis of a toothed
 130 wheel, t , which latter gears with a pinion, u^2 , of a wheel, u . This train of wheels is regu-

lated and controlled in its giving-out motion by a balance-wheel, *v*, escapement hair-spring, and auxiliary parts common to ordinary time-keepers.

5 The action and mode of working the apparatus are as follows: If the light of a lamp requires to be extinguished at, say, five minutes past five o'clock in the morning and the time of lighting is seven o'clock in the evening, 10 then the time mechanism will be set to extinguish in ten hours and five minutes by placing the peg or stop in a position that shall be equivalent to this time. This having been done, the apparatus is left in its normal 15 condition, as in Fig. 2, and on the lamp-lighter proceeding to light the lamp at seven o'clock at night he places the hook of his staff through the usual hole in the bottom of the lantern, and then depresses or pulls down 20 the main lever *i*, which turns the incline *g*² of the cam-plate *g* against the tooth *f*³, which removes it from the notch *e*¹, cutting the rim *e*² of the time-wheel *e*, which thereby depresses the arm *f*² and partially turns the 25 quadrant *f*, and so rotates the plug *d*, and so turns on the gas, which is lighted in the ordinary way. The removal of the tooth from the time-wheel notch (after which it rests on the ledge of the flange) brings the reverse 30 side of the slot of the slightly eccentrically hung cam-plate *g* up to the time-wheel stud or pin *e*⁶, as represented in Fig. 1, so that the lever, cam-plate, time-wheel, and time-wheel axis move together and wind up the spring 35 *m*, during which time the position of the clutch mechanism is neutral, which has the effect of breaking connection with the train of wheels. The lever having been depressed up to the stop, the staff is removed and the 40 apparatus left to work out its time for extinguishing, and with the gap *e*¹ of the time-plate considerably removed from before the tooth *f*³, which represents the space through which the time-wheel is required to travel before extinguishing. The cam-plate on the 45 lever, being liberated, returns to its former position, as represented in Fig. 2.

The apparatus now being set going, the action is as follows: The reverse rotation of 50 the time-wheel and its axis by the uncoiling of the spring brings the straight shoulders *n*² of the boss *n* against the inner ends of the clutches *p*, when the angular movement thus made causes the concentric channels or 55 grooves to grip the inside and outside parts of the inside flange of the time-wheel, thereby locking the said time-wheel and re-establishing its connection with the train of wheels and other parts connected therewith for giving 60 the necessary slow rotary motion to the parts, and as five o'clock in the morning approaches the gap of the time-wheel has been brought very near to the tooth, and at a later time, on both of them becoming coincident, 65 the tooth falls into the notch, and so causes the toothed quadrant to be moved accordingly and the gas cut off by the rotation of

the plug in a reverse direction to that when winding up.

Having thus described our invention, we 70 claim as new and desire to secure by Letters Patent—

1. In an automatic instantaneous gas-lamp extinguisher, the combination, with a gas-lamp and its cognate parts—such as the supply-pipe burner and plug—of automatic mechanism for turning said plug, comprising a 75 spring-actuated lever connected to the plug, a spring-actuated motor, a lever connected to the winding-arbor of said motor, a graduated time-plate arranged in the vicinity of said lever, and a movable stop on said time-plate adapted to limit the movement of said lever, a revolving detent, and a time-wheel carried 80 by the motor mechanism and adapted to release the spring-actuated lever at a point dependent on the amount of movement of the winding-lever, substantially as described.

2. In an automatic gas-lamp extinguisher, the combination, with a gas-supply pipe and 90 a cock thereon, of a lever connected thereto and provided with a tooth, *f*³, a spring connected to said lever, a spring-actuated motor, a lever connected to the winding-arbor thereof, a notched time-wheel carried by the motor and adapted to receive said tooth *f*³, a cam 95 connected to the winding-arbor and adapted to impinge against said tooth, whereby when the lever is depressed the tooth *f*³ will be disengaged from the time-wheel, the motor-spring wound, and the gas-cock opened, substantially as described. 100

3. In an automatic gas-lamp extinguisher, the combination of a spring-actuated motor, a notched wheel carried on a shaft of the 105 same, a spring-actuated lever connected to a gas-cock and having a detent to engage with said wheel, and a winding-lever connected to the winding-arbor of the motor and to the said notched wheel, whereby the depression of said 110 lever will wind the motor and turn the notched wheel in the same direction as the winding-arbor, substantially as described.

4. In an automatic and instantaneous gas-lamp extinguisher, the combination, with automatic extinguishing mechanism comprising 115 a spring-actuated time-motor, of a graduated time-plate, *k*, with holes *k*² and graduations, a movable peg, *l*, and a winding-lever, *i*, connected to the winding-arbor of said motor, substantially as and for the purpose as set forth. 120

5. In an automatic and instantaneous gas-lamp extinguisher, the combination, with a gas-lamp and chronometric or time cutting-off 125 mechanism comprising a spring-actuated motor, a lever connected to the winding-arbor thereof, a time-wheel connected to said motor and having a notched rim, and a cam upon said arbor, of a toothed quadrant, *f*, with arm 130 and tooth *f*² *f*³, normally engaging with the said tooth resting within the notch of the time-wheel, and with the teeth engaging with a pinion on the plug-axis and adapted to ro-

tate the said plug either for turning on or for cutting off, substantially as set forth.

6. In an automatic gas-extinguishing apparatus, the combination, with the gas-supply pipe and a cock thereon, of a spring-actuated lever which engages with said cock and is provided with a detent, a spring-actuated motor carrying a time-wheel, *e*, with notched flange *e*², a lever, *i*, attached to the winding-arbor of said motor, a slotted cam carried upon said arbor and adapted to engage with said detent, and an adjustable clutch or grip mechanism interposed between said time-wheel and said motor, all constructed and arranged substantially as described.

7. The combination, with a gas-lamp, gas-burner, or gas-pipe, *c*, of mechanism consisting of a time-plate, main lever, cam-plate *g*,

toothed quadrant with arm and tooth, geared gas-plug, time-wheel with notch and face rims, clutches and boss carried by great wheel, transmitting, reduction, and regulating gear, and motive power, which are constructed and arranged and operate substantially as and for the purpose as herein described, and set forth in Figs. 1, 2, 3, 4, and 5.

In testimony that we claim the foregoing we have hereunto set our hands this 26th day of April, 1888.

JAMES SIMEON EDGE.

FRANCIS WILLIAM TICEHURST.

Witnesses:

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Both of Birmingham.