

(No Model.)

4 Sheets—Sheet 1

J. J. HIGGINS.
PHOTOGRAPHIC CAMERA.

No. 397,428.

Patented Feb. 5, 1889.

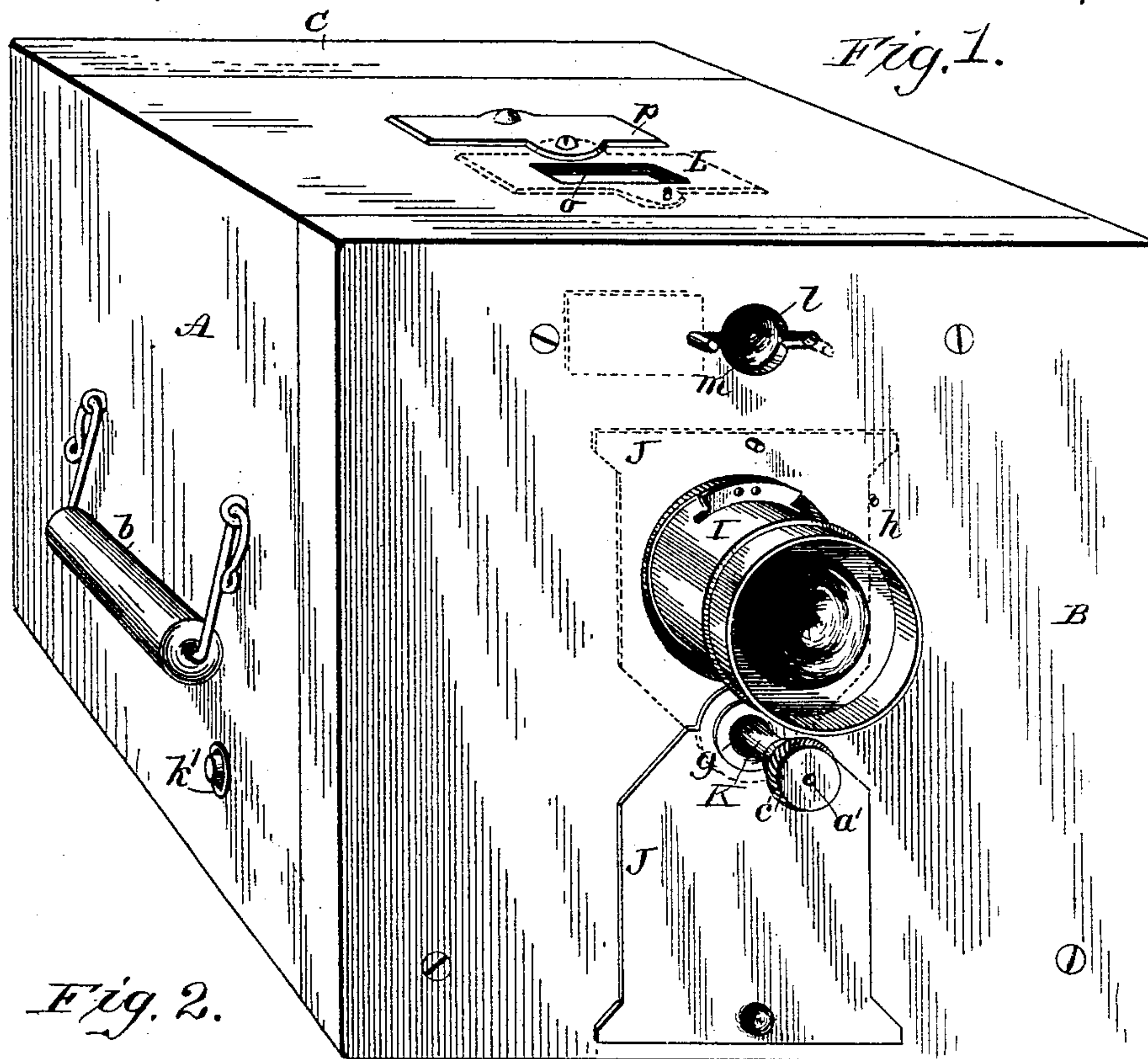
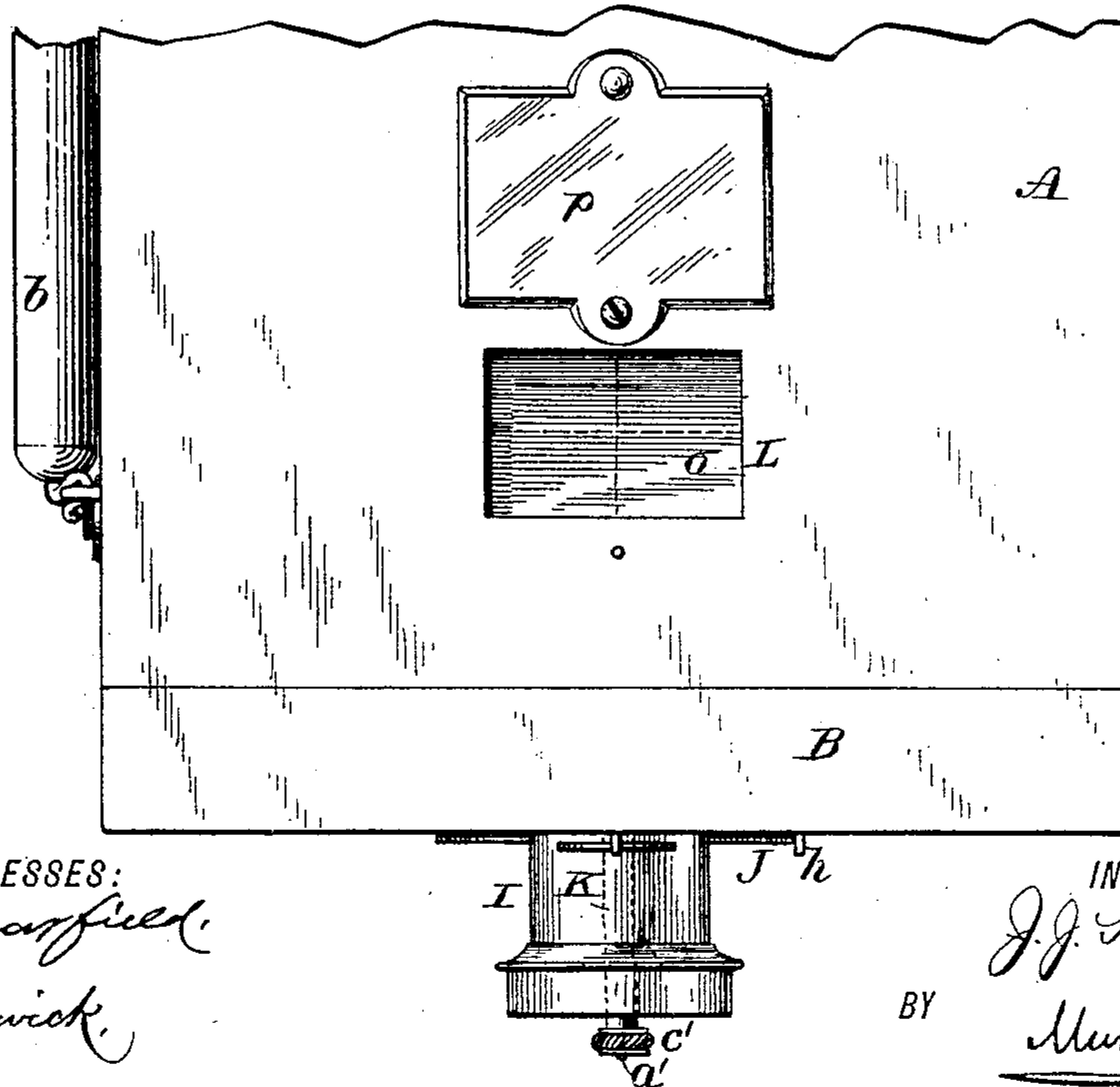


Fig. 2.



WITNESSES:
J. D. Garfield.
C. Sedgwick.

INVENTOR.
J. J. Higgins
BY *Munn & Co*
ATTORNEY.

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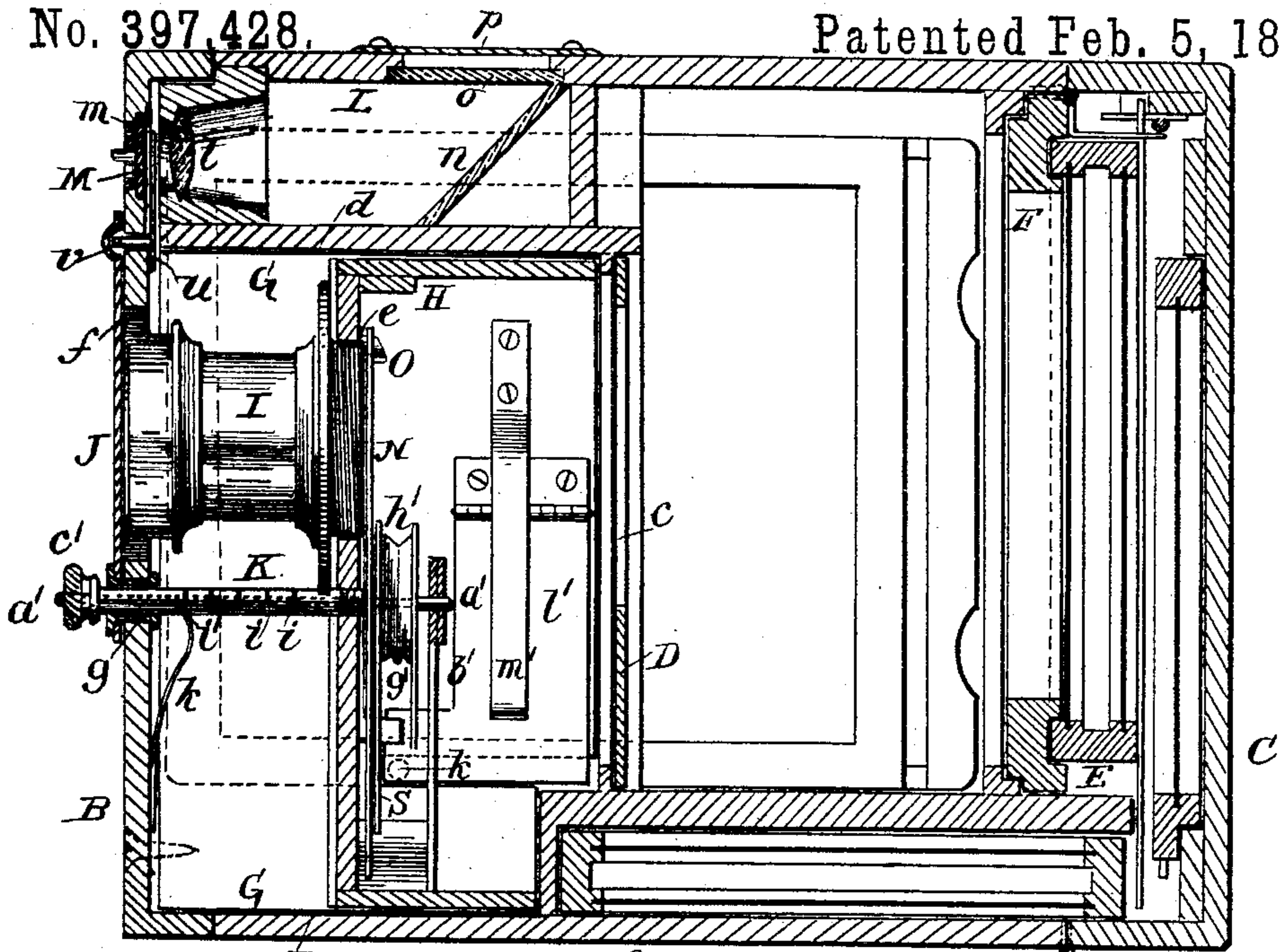
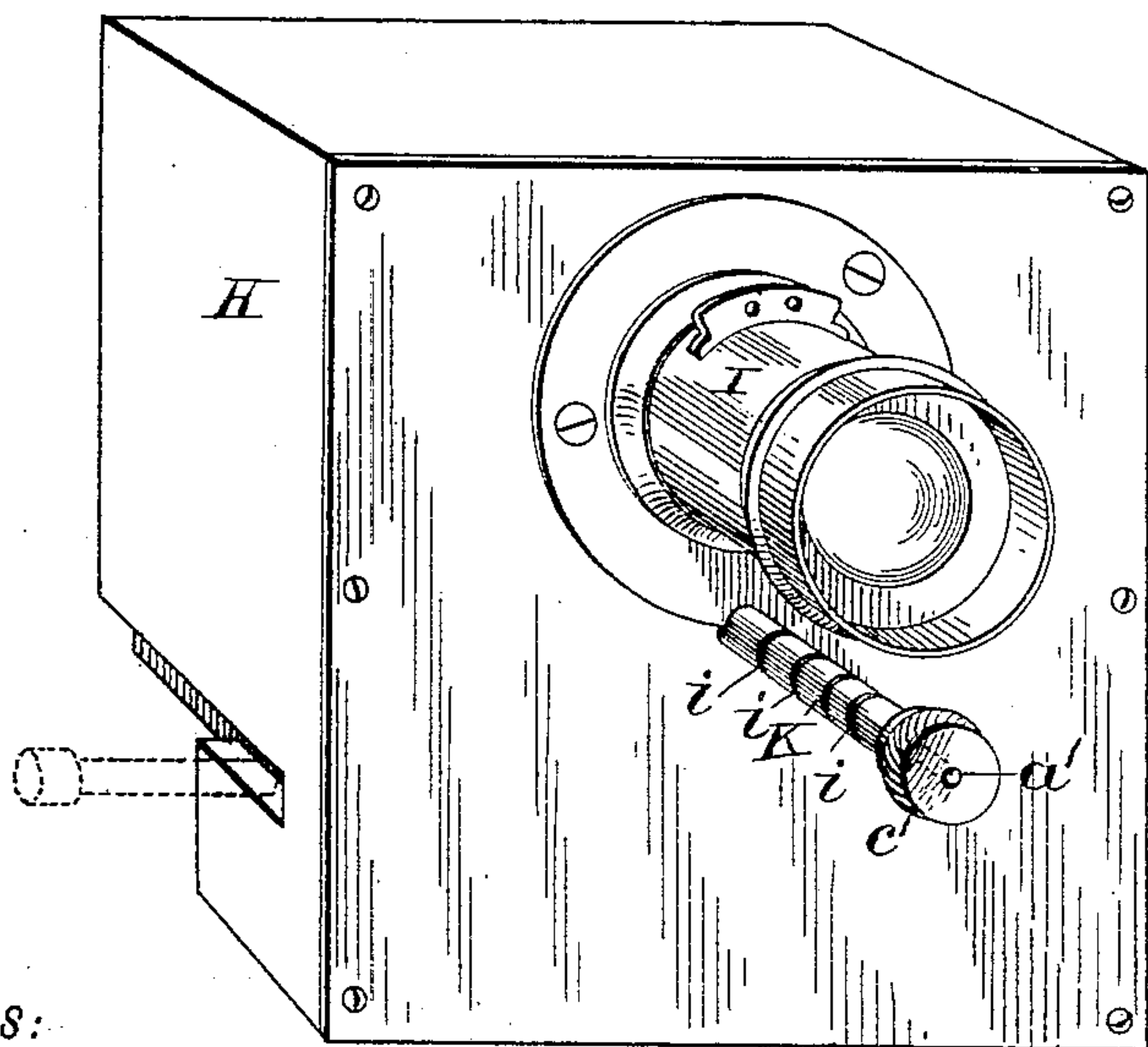


Fig. 3. A

Fig. 4.



WITNESSES:

J. D. Garfield
C. Sedgwick

INVENTOR,

J. J. Higgins
Munn & Co.

BY

ATTORNEY.

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Fig. 5.

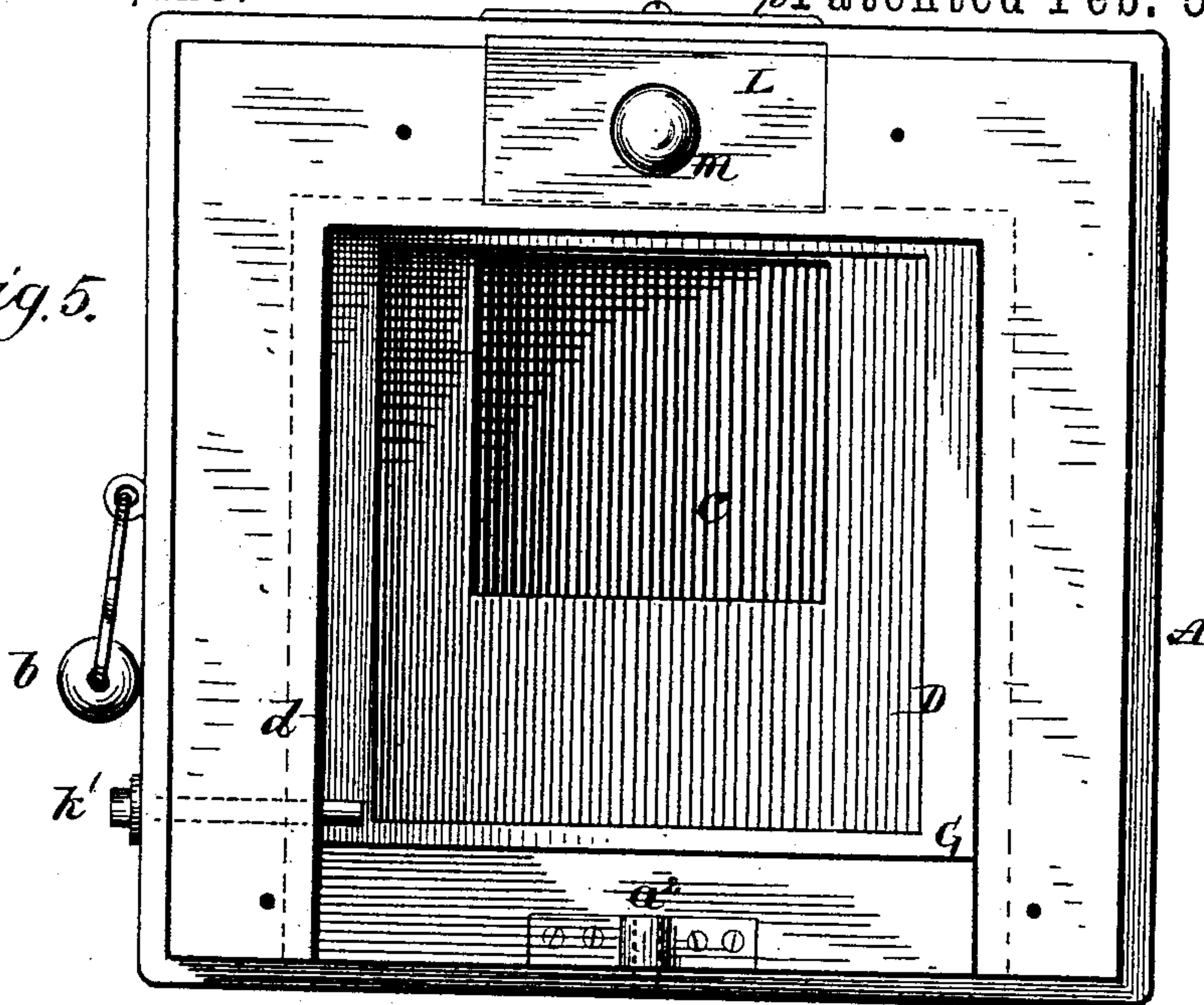
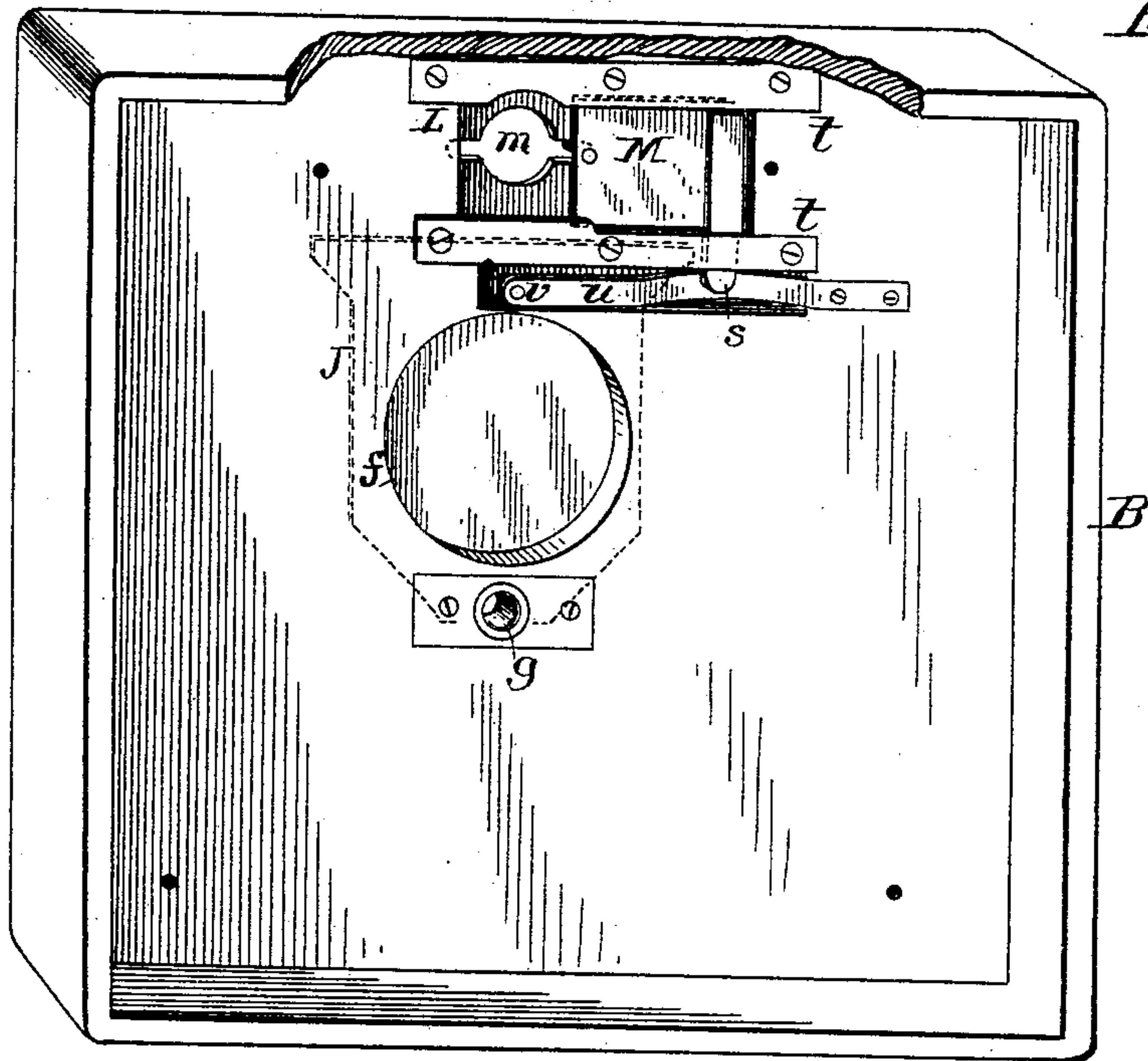


Fig. 6.



WITNESSES:

J. D. Garfield
C. Sedgwick

INVENTOR

J. J. Higgins

BY

Munn & Co

ATTORNEY.

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J. J. HIGGINS.
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Fig. 7. Patented Feb. 5, 1889.

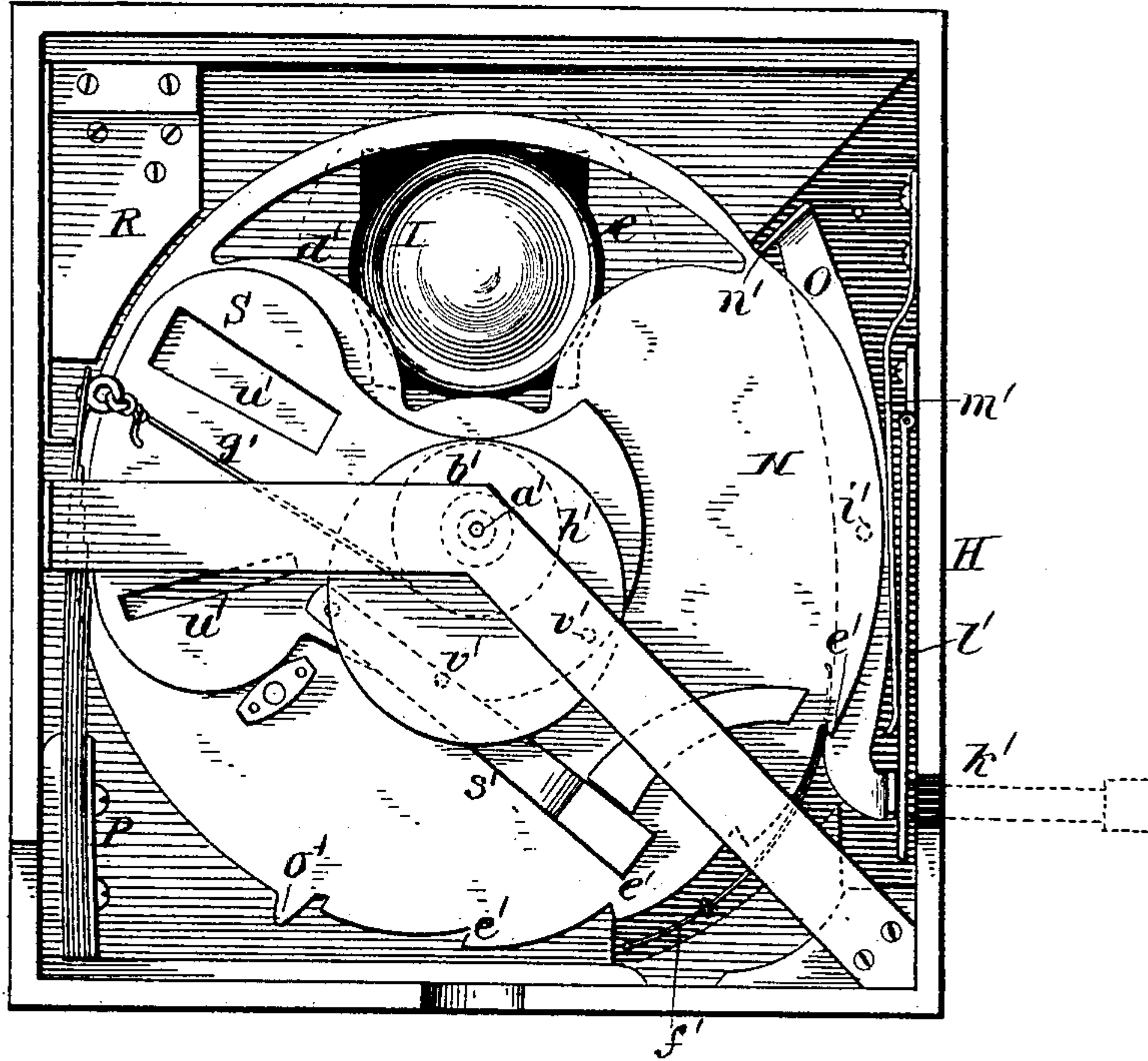


Fig. 8.

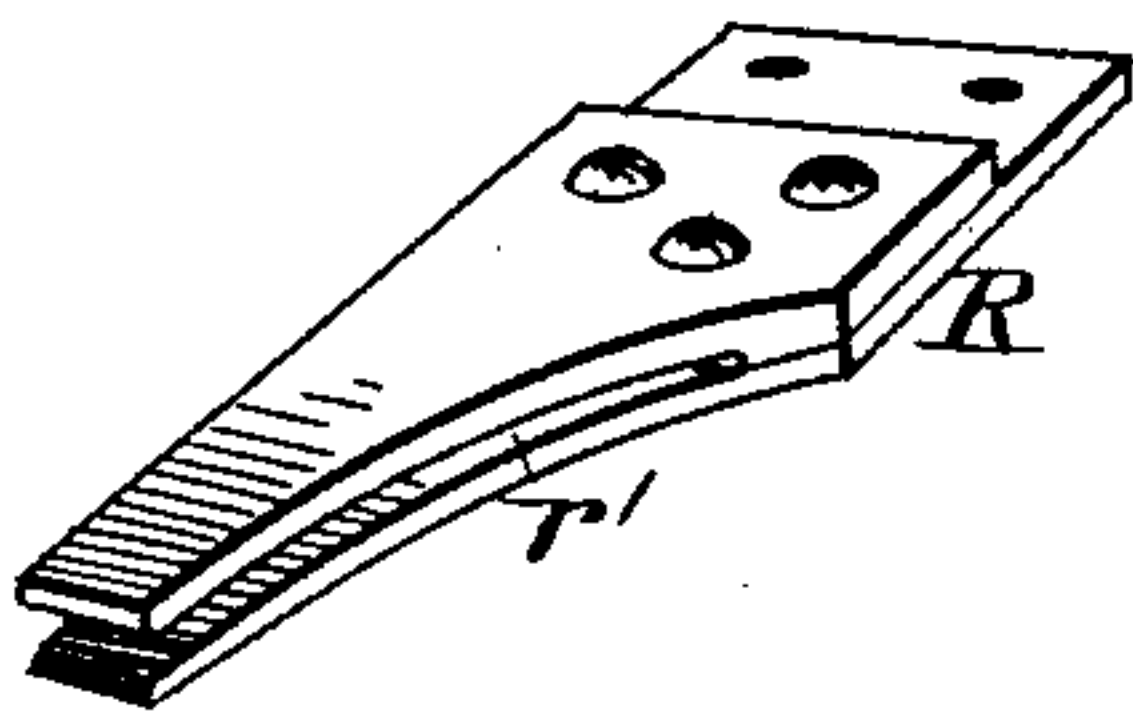


Fig. 9.

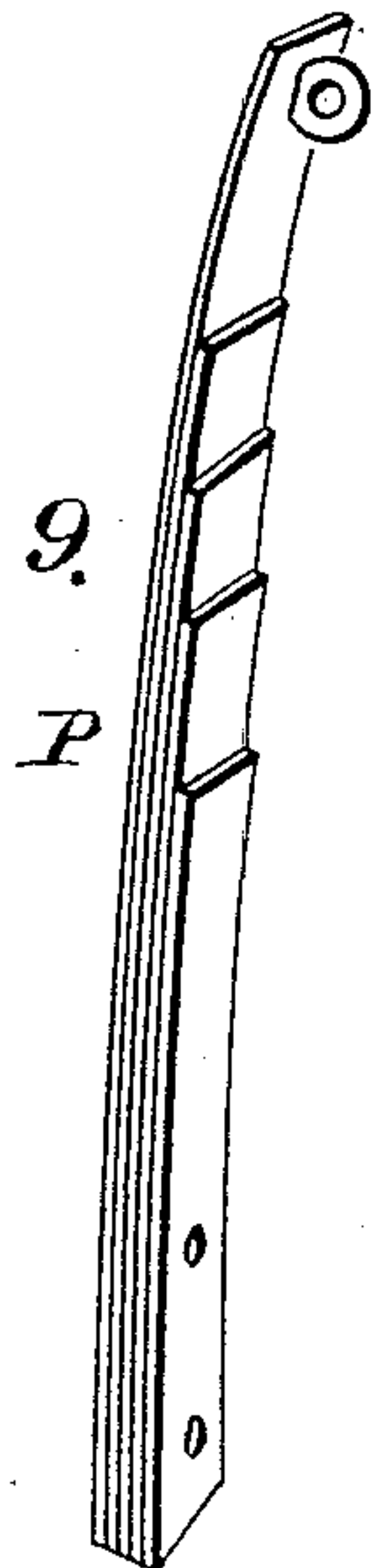
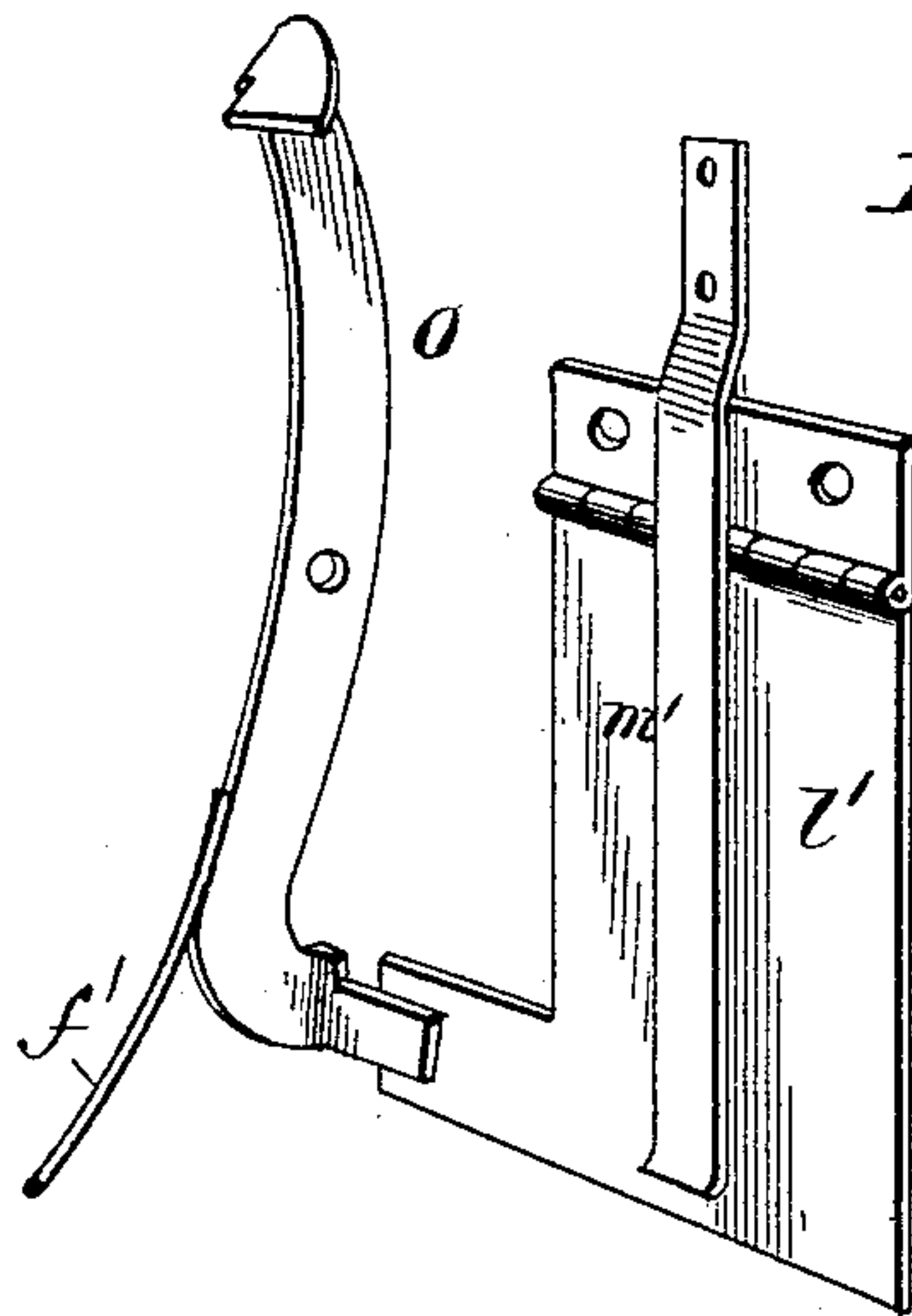


Fig. 10.



WITNESSES:

J. D. Garfield,
C. Sedgwick

INVENTOR.

J. J. Higgins

BY

Munn & Co

ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN J. HIGGINS, OF NEW YORK, N. Y.

PHOTOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 397,428, dated February 5, 1889.

Application filed April 21, 1888. Serial No. 271,369. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. HIGGINS, of the city, county, and State of New York, have invented a new and useful Improvement in
5 Photographic Cameras, of which the following is a full, clear, and exact description.

This invention, while applicable to other photographic cameras, is more particularly designed for what are known as "detective-
10 cameras," and will here be more especially described with reference to such.

The invention consists in certain novel constructions and combinations of parts, including the lens carrying and focusing devices,
15 the shutter and mechanism for operating the same, and the finder and means for controlling the opening and closing of the lens-aperture in relation with the opening and closing of the exposing-aperture of the finder and other
20 parts or devices, substantially as hereinafter described, and pointed out in the claims, the whole instrument, too, being so constructed that it presents little or no mechanism on its exterior to attract special attention as to its
25 character.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

30 Figure 1 represents a perspective view of a photographic camera having my invention applied. Fig. 2 is a top or plan view of the same in part. Fig. 3 is a mainly central vertical longitudinal section of the same with lens and closed. Fig. 4 is a view in perspective of a sliding focusing-box and shutter-carrier with attached lens-tube and device
35 for drawing said box in or out and for setting the shutter. Fig. 5 is a front elevation of the camera open with its front cover and sliding focusing-box removed. Fig. 6 is a partly sectional or broken perspective view, as seen from its interior, of a cover applied to the forward end of the camera-case with certain
40 attachments thereon for controlling the slides which open and close the exposing-apertures of the lens-tube and finder of the instrument. Fig. 7 is an elevation or back view upon an enlarged scale of the interior of the sliding
50 focusing-box and shutter-carrier with shutter

and mechanism for operating and controlling the shutter applied thereto. Figs. 8, 9, and 10 are perspective views, also upon an enlarged scale, of certain details connected with or forming part of the shutter-operating mechanism.
55

A is the body of the case, to which may be attached a handle, *b*, for carrying the instrument, and which is provided with a slip or other cover, B, on its lens end fastened by
60 screws or otherwise to the body, and is further provided at its opposite or plate-holding end with a hinged or otherwise attached cover, C.

D is the partition or diaphragm, having an
65 exposing-aperture, *e*, back of the lens and between the lens and the plate-holder E and its frame F when adjusted for use. This apertured diaphragm D is at the rear end of a stationary box part or chamber, G, in the lens-
70 end portion of the body of the camera, which chamber—preferably of rectangular form—is open in front and has its sides lined with velvet or cloth or other light-excluding material *d*. Said chamber G serves to receive freely,
75 but closely, within its lined sides a movable lens-box, H, open in the rear, but closed in front excepting where an aperture, *e*, is made for light passing through the lens. This
80 movable lens-box H has the tube I, which carries the lens immovably secured in any suitable or detachable manner to the front of it so as to project in front thereof and in line with the aperture *e* and with the exposing-
85 aperture *f* in the cover B. Said lens-box H, which also carries the shutter at the back end of the lens-tube, being fitted as described, is free to be slid or moved in or out, and the attached lens or lens-tube along with it, within the chamber G, in a light-tight manner, for
90 the purpose of focusing, thus dispensing with a bellows.

Instead of lining the camera-chamber, as described, with cloth or other light-excluding material, the lens-box may be covered there-
95 with and the exclusion of light similarly effected. The position of the shutter is by no means confined to the rear of the lens, a slight alteration of mechanism allowing it to be placed in front of or within the lens-tube.
100

When this focusing sliding box or lens and shutter-carrier H is moved fully back, as shown in Fig. 3, the lens-tube occupies a position wholly within the chamber G and its end cover, B, and so that the exposing-aperture f may be closed by a sliding face-plate or cover, J, on the exterior of the cover B. This face-plate, which is represented in the form of an escutcheon—but may be of any other suitable shape—is shown as united below the cover B by a hollow rivet or pivot, g , and as striking against a stop, h , when turned up to close the exposing-aperture f . For exposure or to draw the lens-tube I out through the aperture f , for the changing of stops or other purposes, the cover J is turned down, as shown in full lines in Fig. 1, or it may be otherwise adjusted out of the way of said aperture. This adjustment of the lens is effected by pulling outward upon a post, K, secured to the sliding lens-box H and passing out through the hollow rivet or pivot g . Said adjusting-post K has a graduated series of grooves or notches, i , in it, at different points in its length, corresponding to the required adjustment of the lens to suit different focuses or distances the object to be photographed is from the lens. A click-spring, k , engages with the notches i in this post to indicate the proper projection of the lens-tube for photographing an object at a given distance, the noise or sensation produced by the engagement signifying that the required projection has been made. Thus, when the post K is drawn out so that the click-spring k engages with the outer end or first of the notches i , the lens has been properly adjusted for photographing at a certain distance, and accordingly as said post is farther drawn out to engage the spring K with any one of the succeeding notches i will the lens be adjusted for photographing at another distance dependent upon the notch with which the click-spring is made to engage, each backwardly-succeeding notch answering for a given alteration of distance. This engaging of the click-spring k , however, with the post K does not prevent another adjustment being made for focusing.

L is the finder applied to the case of the instrument above the chamber G and in a like vertical plane with the lens-tube, l being the lens of the finder, m its exposing-aperture in the cover B, n its mirror, and o its ground glass, protected by a sliding cover, p .

The exposing-aperture m is provided with a slide, M, for opening and closing it, as required. When said slide M is closed, it is made to lock or hold the slide or cover J of the lens-exposing aperture f also closed, to prevent accidental or untimely exposure. This may be done by any suitable locking devices controlled by the slide M, and which are here shown (see Fig. 6) as consisting of a sliding strip, s , attached to the back of the slide M, working within guides t , and moving, when the slide M is closed, over a bent spring-catch,

u , having a pin, v , on its outer end, which engages, through an aperture in the cover B, with a corresponding aperture or recess in the slide or cover J when the latter is closed, and as the sliding strip s slides over the bent and free end portion of the spring-catch u . When the slide M, however, is opened, then the attached strip s ceases to bear upon the spring-catch u to close it, and said spring-catch relieves itself from engagement with the slide or cover J, which then may be opened as required.

The post K, by which the sliding box H, with its attached lens-tube I, is slid in or out, is made hollow to receive longitudinally through it the spindle a' of a rotary shutter within the box H, said spindle turning at its inner end in a rear bearing formed by a brace, b' , and projecting at its outer end beyond the outer end of the post K to receive or have screwed upon it a knob, c' , by which to turn the spindle a' back and set the shutter for exposure. This same knob also (by further rotation) gives increase of velocity or tension to shutter of a graduated and set character. By the connection, too, of the spindle a' with the post K, which latter serves as a bearing for the spindle in front of the shutter, said spindle—that is restrained from independent longitudinal movement while free to turn upon its axis—serves, through the knob c' , when simply pulling or pushing upon it in a straight line, to adjust the box H with its attached lens-tube in or out, or, in other words, the focus, whereby the same device answers, accordingly as the knob c' is either pulled or pushed upon or turned, to both adjust the focus or lens-tube I and to set the shutter, also to give it less or greater rapidity, as also to withdraw the lens from the camera for change of diaphragm or stops.

N is the rotary shutter, of disk form, secured to the spindle a' , and having an aperture, d' , of any suitable shape, in range with the lens, exposing aperture e , back of the lens-tube I. This apertured disk or rotary shutter N, which works close up to the back of the lens-tube I, has a series of ratchet teeth or notches, e' , in or on its periphery, with which a lever-catch, O, controlled by a spring, f' , and having its fulcrum at i' , (see Fig. 7,) engages to hold the shutter N when closed and turned back, to give it any desired speed and throw for the purpose of varying the length of exposure, the shutter N being shot when the lever-catch O is released from either of the notches e' by the action of a compound spring, P, and cord g' , attached at its one end to said spring and at its opposite end to a pulley, h' , fast on the spindle a' , and around which said cord winds and unwinds. Accordingly to the extent the shutter N is turned back by the knob-spindle a' to carry its exposing-aperture d' more or less beyond the lens-tube will the lever-catch O be made to engage with a certain one of the notches e' , and in so doing the compound spring P will be pulled upon by the cord g'

and be correspondingly flexed to give it more or less tension, so that when the lever-catch O is released the shutter will be shot with more or less force to give a long, medium, or short exposure, as required.

In the ordinary construction of photographic shutters the periphery is only provided with one notch, as only velocity of the shutter is intended, and no means are provided for increasing the velocity of the shutter by turning it back and providing additional notches. In my invention, it will be noticed, the shutter is constructed with a graduated series of notches additional to and arranged beyond the usual single notch, whereby the shutter may be backwardly rotated and its tension upon the spring increased. Any desired degree of spring-tension may be given to the shutter, and the velocity of the shutter and the length of the exposure of the sensitive plate may be quickened or slowed, according to the notch to which the shutter is set.

The compound spring P is made up of a series of leaves, (see Figs. 7 and 9,) gradually increasing in number toward its root, whereby the tension of the spring is controlled not simply by the extent of its flexure, but by the number of its leaves or separate springs brought into active operation accordingly as the lever-catch O is engaged with a near or distant notch, e' , thereby effectually securing either a very slow, a medium, or a very rapid shooting of the shutter and a proportionate long, short, or medium exposure. The number of the leaves of the spring P and their arrangement may be proportioned to the number and distances apart of the notches or teeth e' in the shutter, so that an additional spring-leaf may be brought into play for each succeeding tooth the lever-catch O is engaged with.

The lever-catch O is released to throw the shutter by pressing inward upon the button k' , which bears against a hinged plate, l' , that is controlled by a spring, m' , and is in contact with the lower or free end of the lever-catch O. When the lever-catch is released, its engaging end rides over or in a depression, n' , on the shutter, to hold the latter so that its aperture will be in line with the lens-tube, and the shutter N is furthermore provided with a stop tooth or projection, o' , that, as the shutter is shot forward by its spring, enters a wedge-shaped slit, r' , in a more or less elastic cushioning-piece, R, to gradually stop the shutter and to avoid jar incidental to an abrupt arrest of the shutter.

Upon the back of the rotary disk-shutter and adjustable around or about its axis, upon lifting a spring-catch, s' , is an auxiliary shutter, S, having any number of radial apertures, u' , of various sizes and shapes, adapted to give variations of exposure, or exposure of greater dimensions in one direction than another, as desirable, in photographing certain scenes or objects. This is effected by turning or adjusting the auxiliary shutter S so

that any one of its exposures u' is brought in line with or opposite the aperture d' in the main shutter N, and then holding or locking the same by adjusting the spring-catch s' , having a projection or pin on its outer end to engage with one of a series of holes, r' , in the auxiliary shutter, said holes r' being arranged to correspond with the series of apertures u' , to keep them—that is, one at a time—in line with the lens-tube I or across the same.

While the camera is mainly designed as a portable one, it may be supported upon a tripod, if desired, and be provided with a socket attachment, a^2 , in the bottom or elsewhere, or other suitable device for the purpose.

So much of the camera as relates to the plate-holding portion in the rear of the instrument, as has herein been shown or described, forms no part of this application, inasmuch as I make it the subject of a separate application filed simultaneously with this.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a photographic camera, the combination, with the sliding focusing-box and its attached lens or lens-tube, of a forwardly exteriorly extending actuating post or rod, operated substantially as shown and described.

2. In a photographic camera, the combination, with the sliding focusing-box and its attached lens or lens-tube, of a forwardly exteriorly extending actuating post or rod having graduations thereon to indicate alterations of focus and operated substantially as shown and described.

3. In a photographic camera, the combination, with the sliding focusing-box and its attached lens or lens-tube, of an actuating post or rod having graduations or grooves for indications of alterations of focus and a click-spring engaging in said graduations to give audible or sensible expression thereof, essentially as described.

4. In a photographic camera, the spindle forming the axis of the shutter and actuating the same, said spindle being also connected with and actuating the sliding lens or focusing-box, as herein shown and described, whereby alteration of the focus and adjustment of the shutter to required position are effected by said spindle, as set forth.

5. In a photographic camera provided with a rotary shutter controlling the lens, the combination of a forwardly-attached shutter spindle or rod attached to said shutter, and a hollow post or tube through which the spindle passes and by which it is supported, substantially as specified.

6. In a photographic camera, the combination, with a sliding focusing-box having an attached lens or lens-tube and rotary shutter controlling said lens, of a forwardly-attached shutter spindle or rod and a hollow post or tube affixed to the sliding box through which the spindle passes and by which it is supported, substantially as described, whereby

the same knob or handle of spindle serves to adjust the focus of lens by the movement of lens-box, and also to set the shutter ready for exposure and likewise adjust, as may be desired, the velocity of shutter for less or greater exposure and again enable a change of diaphragms or stops to be made by the withdrawal of lens from inside of box, as set forth.

7. In a photographic camera provided with a finder, the combination, with a slide or cover applied to the exposing-aperture of the lens proper of the camera, of a slide or cover applied to the exposing-aperture of the finder, and a locking mechanism organized to lock the closed cover of the main exposing-aperture when the cover of the finder exposing-aperture is closed, essentially as herein set forth.

8. In a photographic camera provided with a finder, the combination, with the front or forward cover of the camera-case provided with both focusing and finder exposing apertures, of a sliding focusing-box with attached lens-tube adapted to move in and through said focusing-aperture, the slides or covers applied to both of said apertures, and a locking mechanism organized to lock the closed cover of the focusing-aperture when the cover of the finder exposing-aperture is closed, substantially as specified.

9. The combination, with the front or cover B, having focusing and finder exposing apertures f m of the slides or covers J M, the strip or attachment s secured to the cover M, and the spring-catch u , adapted to engage with the cover J, when both slides or covers J M are closed, essentially as described.

10. In a photographic camera provided with a rotary shutter adapted to control the lens tube or opening of the instrument, and which when released is shot or operated by a spring, the rotary shutter, provided with a stop-tooth or projection, o' , in combination with a cushioning attachment, R, having a wedge-shaped slot adapted to receive the stop-tooth within it and operating to smoothly and gradually arrest the shutter after it has been shot, substantially as specified.

11. The rotary shutter, constructed with a graduated series of ratchet-teeth or notches,

e' , additional to and arranged beyond the usual single tooth or notch for holding the shutter on tension, in combination with the lever-catch O, means for setting or adjusting the shutter as desired, and the spring with attached connecting means for actuating the shutter when released, essentially as specified.

12. The combination of the button k' , the spring-controlled plate l' , the spring-controlled lever-catch O, the rotary shutter N, having ratchet teeth or notches e' , the spring P, the cord g' , and the pulley h' , substantially as shown and described.

13. In combination with the apertured rotary shutter N, the adjustable auxiliary shutter S, having one or more apertures of varying size and shape, and means for holding said auxiliary shutter in position as required, essentially as specified.

14. In a photographic camera, the combination, with the shutter, of a series of springs connected therewith, said springs being arranged to come into successive operation as further rotation or progression of said shutter is made, as set forth.

15. In a photographic camera, the arrangement in conjoined operation, substantially as herein described, of the shutter, its holding device, and driving-spring, so that the velocity of the shutter and the consequent quickness of the exposure of the sensitive plate may be increased or diminished at the will of the operator by the act of setting the shutter and according to the position in which the shutter is placed, all as set forth.

16. In a photographic camera, the combination, with the rotary shutter having a series of teeth or notches and a lever-catch engaging therewith, of a spring composed of a series of leaves of different lengths, which are operated in conjunction with the rotary shutter, substantially as described, whereby on the rotation of the shutter the force of one or more of said springs will be brought to act upon the shutter according to the number of notches or degrees of rotation given to the shutter, as set forth.

JOHN J. HIGGINS.

Witnesses:

C. SEDGWICK,
E. M. CLARK.