

(No Model.)

2 Sheets—Sheet 1.

N. NELSON.
KINETOGRAPHIC CAMERA.

No. 594,094.

Patented Nov. 23, 1897.

Fig. 1

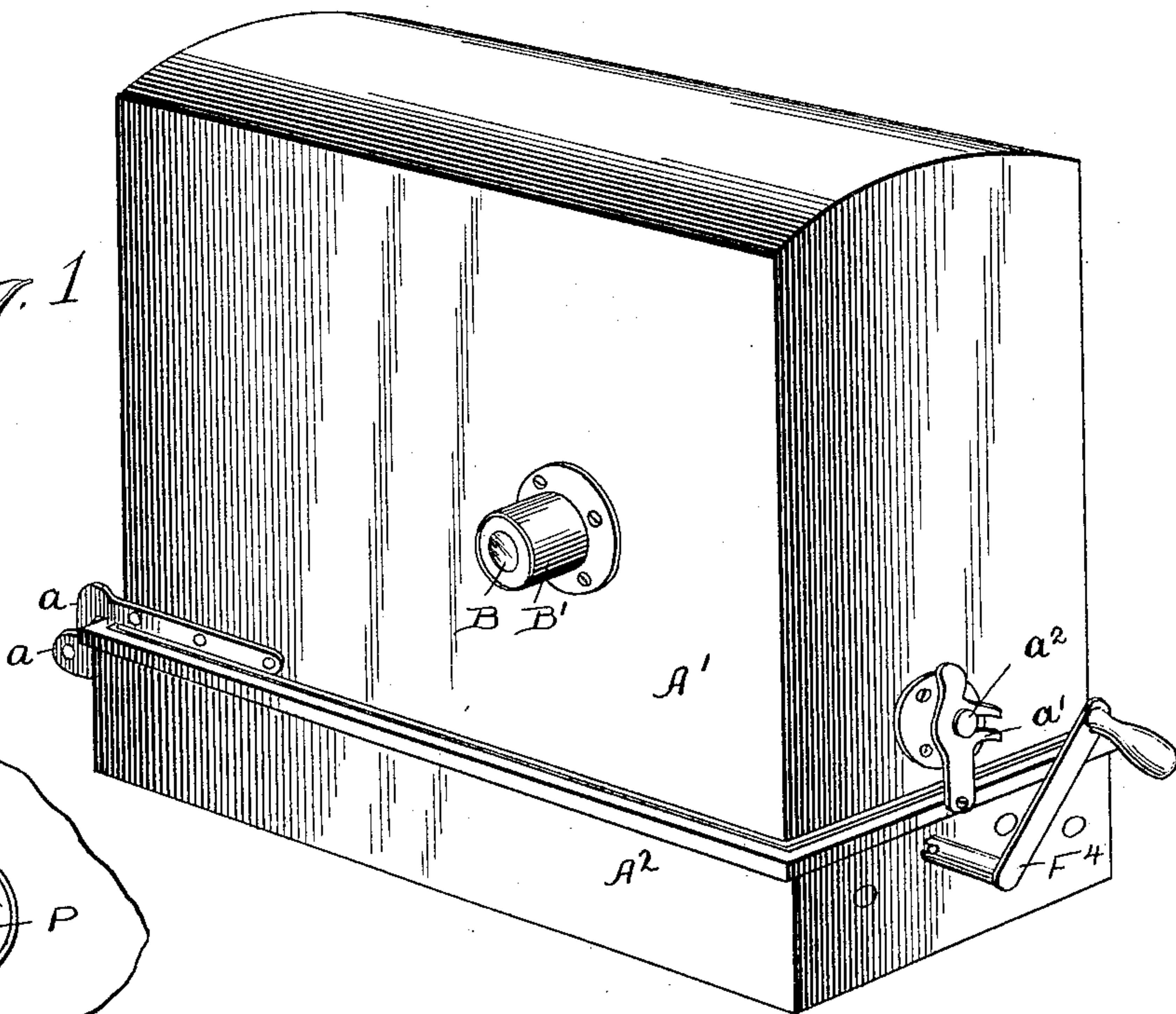


Fig. 3.

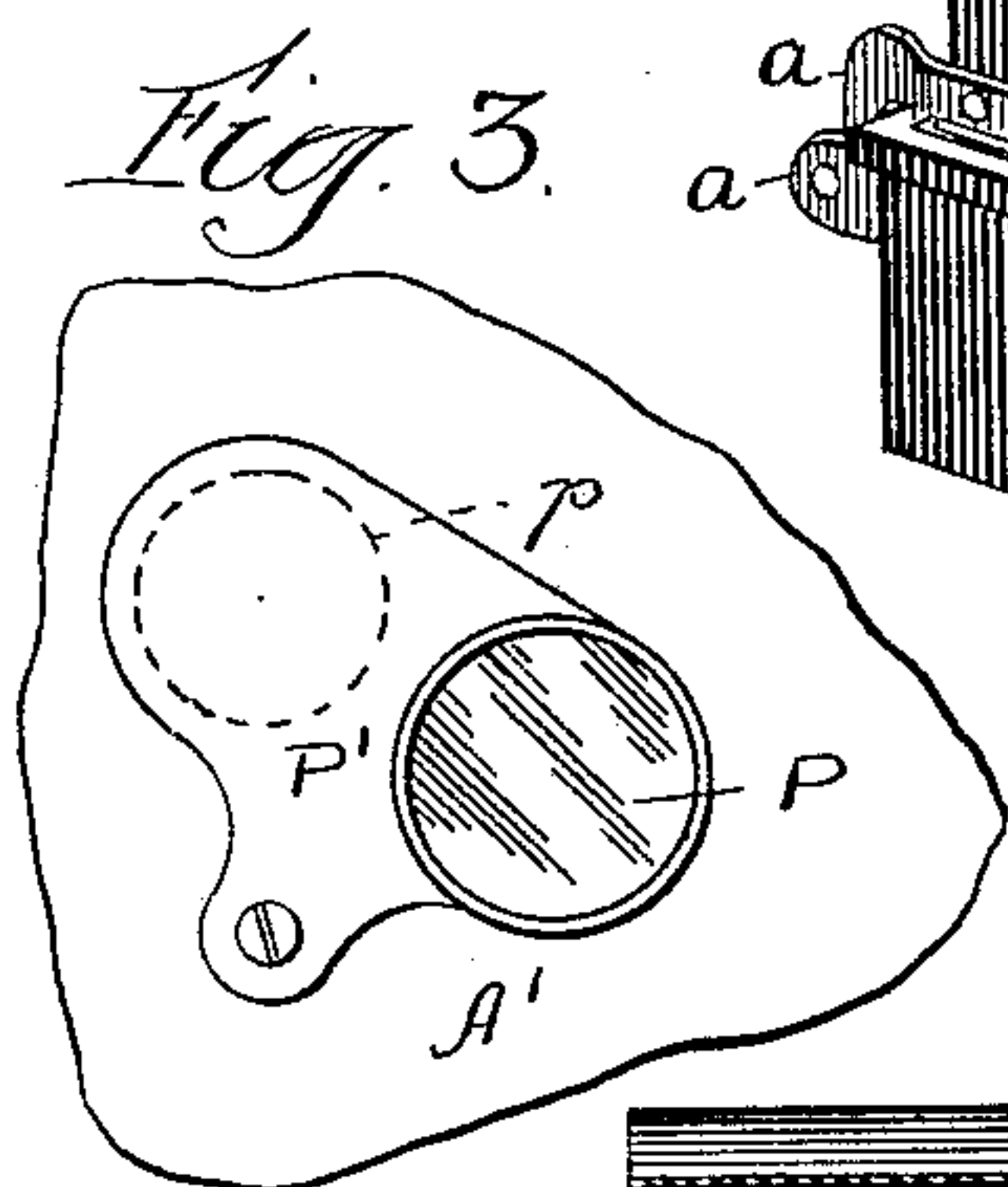


Fig. 2

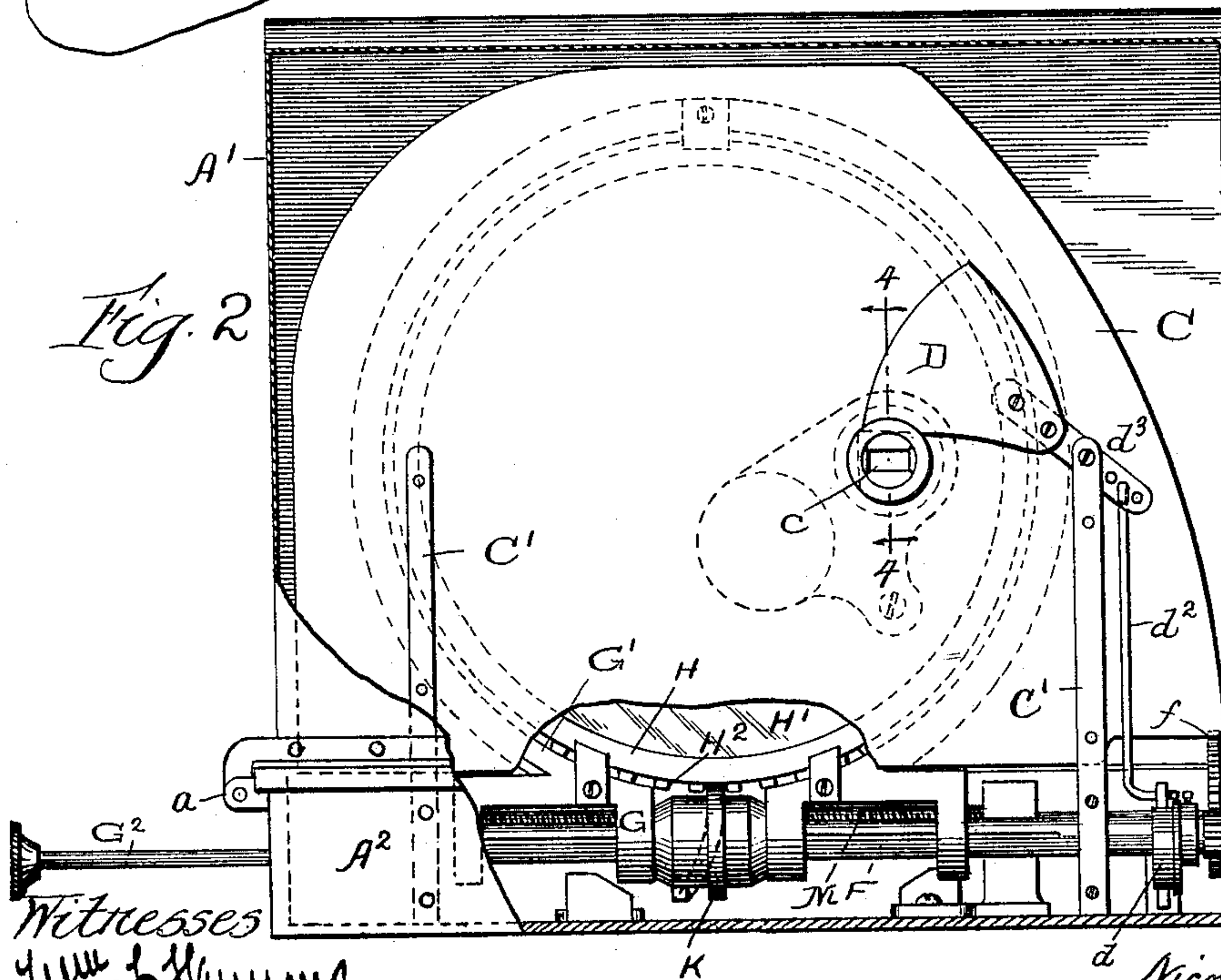
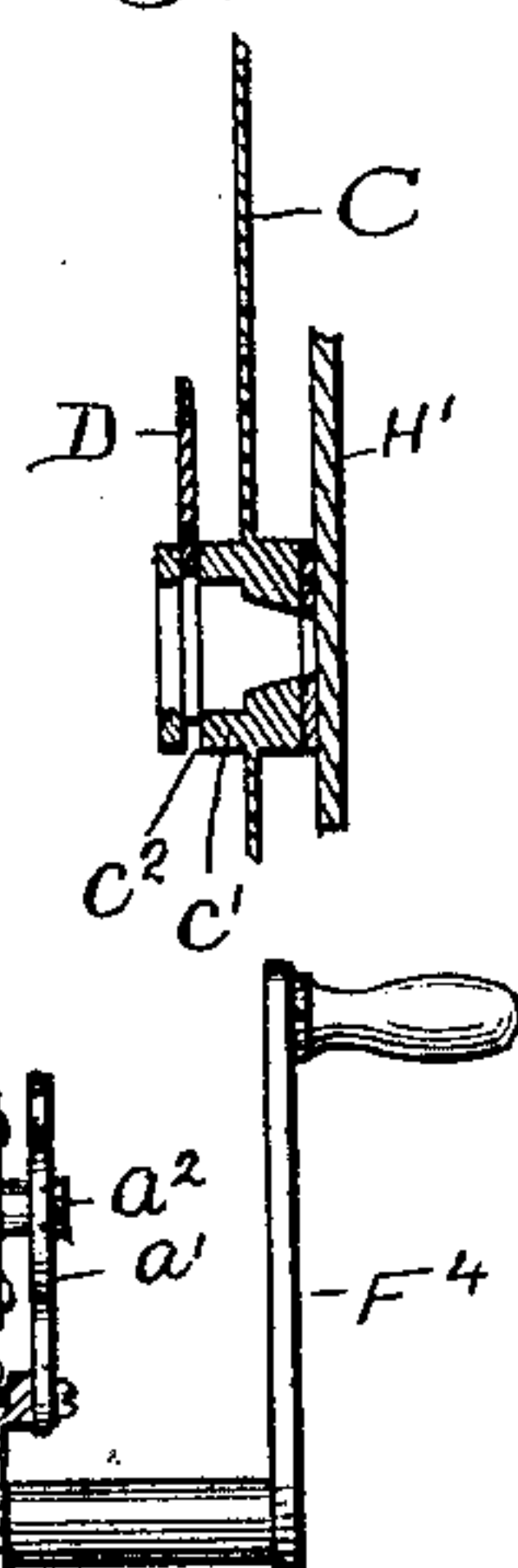


Fig. 4.



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Atts.

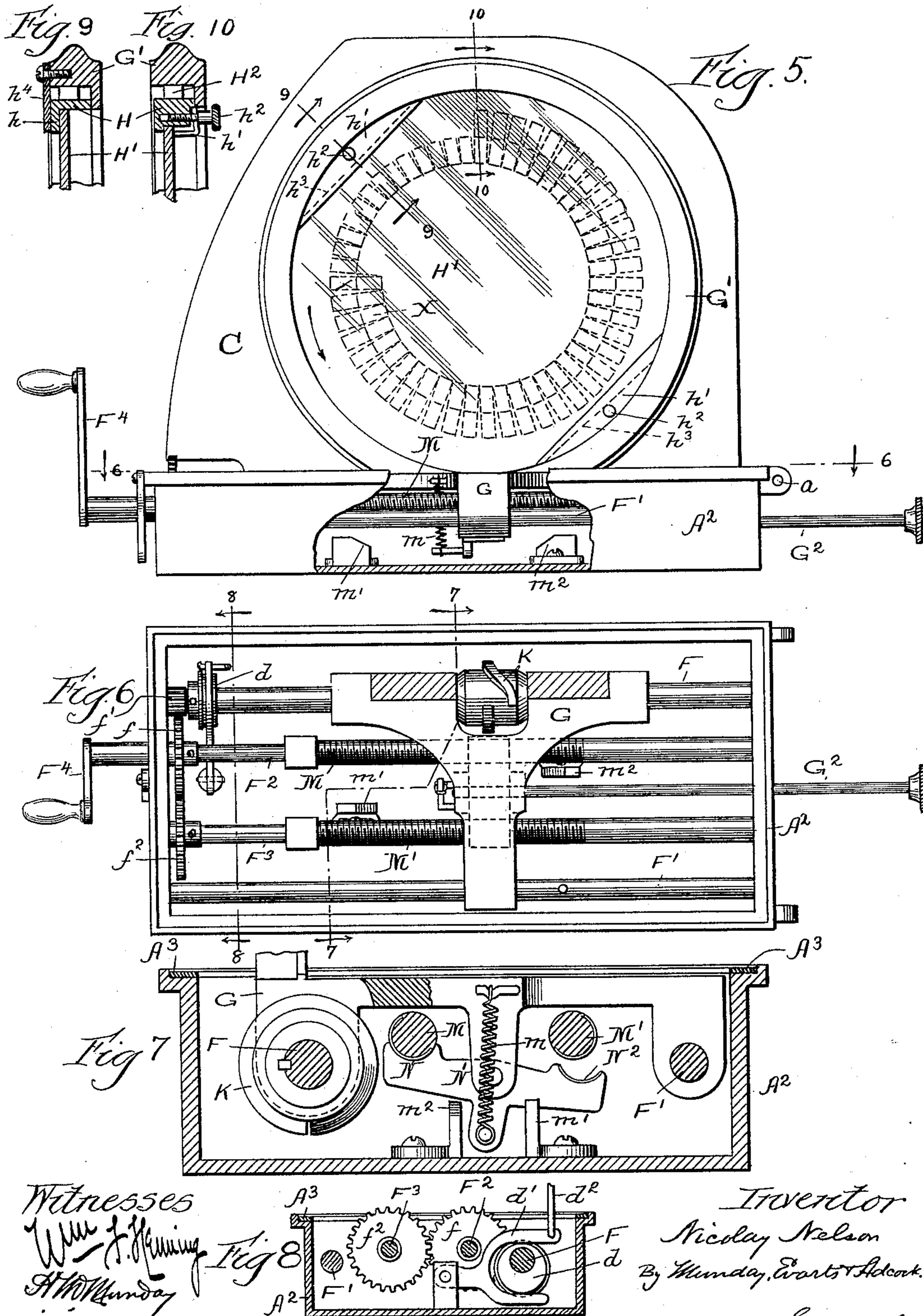
(No Model.)

2 Sheets—Sheet 2.

N. NELSON.
KINETOGRAPHIC CAMERA.

No. 594,094.

Patented Nov. 23, 1897.



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By Munday, Ewart & Adcock.
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UNITED STATES PATENT OFFICE.

NICOLAY NELSON, OF WAUKEGAN, ILLINOIS, ASSIGNOR TO HIMSELF AND
THE CHICAGO RECORDING SCALE COMPANY, OF SAME PLACE.

KINETOGRAPHIC CAMERA.

SPECIFICATION forming part of Letters Patent No. 594,094, dated November 23, 1897.

Application filed June 10, 1897. Serial No. 640,132. (No model.)

To all whom it may concern:

Be it known that I, NICOLAY NELSON, a citizen of the United States, residing in Waukegan, in the county of Lake and State of Illinois, have invented a new and useful Improvement in Apparatus for Taking, Enlarging, and Projecting Successive Pictures of Moving Objects, of which the following is a specification.

10 The object of my invention is to provide an apparatus of a simple, cheap, light, or easily-portable construction for taking successive photographs of moving objects, and by means of which also the pictures taken may be enlarged and projected, so that the same apparatus may be used for both purposes, and by means of which also the pictures may be taken in continuous successive spiral rows or lines upon a flat or other surface, as contradistinguished from the long, narrow, flexible ribbon or film heretofore generally employed. To accomplish this result, and herein my invention consists, I combine with the lens and intermittently-operated shutter a film or plate holder (for in my invention the pictures may be taken on an ordinary glass plate as well as upon a flexible film) which is given both a rotary and a rectilinear movement, so that the pictures are taken on the surface of the plate or film in a continuous spiral composed of a number of successive turns or coils, which may cover substantially the whole area of the film or plate whatever may be the shape or form of its surface. The surface of the film or plate may preferably be a flat or plane surface, although it may be made of any other suitable form or shape, upon which the pictures may be taken or arranged in a continuous spiral path or successive rows by imparting to the film or plate holder both rectilinear and rotary movements. The rotary movement imparted to the film-holder, picture-holder, or plate-holder is preferably an intermittent one, so that during each exposure the film, plate, or picture may remain stationary while it is being taken or while it is being enlarged and projected.

My invention also consists in the novel construction of parts and devices and in the novel

combinations of parts and devices herein shown and described, and specified in the claims.

In the accompanying drawings, Figure 1 is a perspective view of an apparatus embodying my invention. Fig. 2 is a front side view with the inclosing case partially broken away. Fig. 3 is a detail view showing the condenser which is used when the apparatus is used for projecting and enlarging pictures already taken. Fig. 4 is a detail section on the line 4 4 of Fig. 2. Fig. 5 is a rear side view with the upper hinged portion of the case removed and with the base portion of the case partly broken away. Fig. 6 is a plan looking from the line 6 6 of Fig. 5. Fig. 7 is a cross-section enlarged on line 7 7 of Fig. 6. Fig. 8 is a cross-section on line 8 8 of Fig. 6, and Figs. 9 and 10 are detail sections on lines 9 9 and 10 10 of Fig. 5.

In the drawings similar letters of reference indicate like parts throughout all the figures.

In said drawings, A' A² represent the inclosing case or framework in or upon which the machine is mounted. This inclosing case is preferably composed of two parts A' A², hinged together at one end by the hinges *a a* and securely fastened at the other by the latch or hook *a'* engaging the knob or pin *a*². The base portion A² of the case is provided with a felt or other packing A³, upon which the lower edge of the hinged part A' of the case fits, so as make a light-tight closure.

B is the lens, the same being mounted in a lens-tube B', secured to the case, the case of course being provided with an opening opposite the lens.

C is a screen, preferably of blackened sheet metal and secured to the uprights C' C', attached to the base portion A² of the case. This screen C is provided with an opening or window *c* of the form and size desired for the picture, the same being preferably rectangular.

Surrounding the window *c* in the screen C is a shutter-guide *c'*, having a slot *c*², in which the shutter D works. The shutter D is intermittently operated, as required, to make each successive exposure, by a cam *d* on the

shaft F operating a lever d' , which is connected by a link d^2 with the arm or lever d^3 , to which the shutter D is attached.

G is a slide adapted to reciprocate back and forth on suitable guides F F' within the case the shaft F preferably serving as one of the guides upon which this slide reciprocates.

Mounted upon the slide G is the rotary plate, film, or picture holder H. The plate, film, or picture holder H, which I have illustrated in the drawings, is one designed to receive a flat or plane-shaped film or plate. It consists, preferably, of a ring having a shoulder h to receive the rim or edge of the plate or film and in which the plate or film H' may be secured by suitable clamps h' , which are pressed against the rim or edge of the plate by clamp-screws h^2 or other suitable means. The plate-holder or ring H should also be provided with a notch, projection, or flattened portion h^3 , against which a correspondingly-shaped portion of the plate H' may fit to prevent the plate H' turning in its holder and to aid in adjusting the plate in proper position. The plate-holder H is preferably journaled or mounted to rotate in a stationary ring G', attached to or preferably formed integrally with the slide G. The plate or film holder H is also preferably provided on its periphery with a series of teeth or notches H², which are engaged by a worm-cam K on the rotating shaft F, which imparts an intermittent rotary movement to the holder H. The worm-cam K has a straight or right-angle portion, (illustrated in Fig. 2,) which keeps the holder stationary during the interval of exposure, and an inclined portion, as illustrated in said figure by the dotted line, which gives the necessary step-by-step rotary movement to the plate-holder while the shutter is closed. The plate-holder carrying slide G is fed or moved in a rectilinear path by a screw M on the driving-shaft F², which engages a nut N on the slide G. A second screw M', having a reversed rotation or thread, serves, when desired, to feed the plate or film holder slide in the opposite direction—when it is desired, for example, to employ the machine for enlarging and projecting the pictures in their reverse order to that in which they are taken—the nut-carrying arm N' being provided with a second nut N² for this purpose. The nut N is held in engagement with the screw M by a spring m , connected to the nut-carrying arm N' directly opposite its pivot, so that the spring will serve to hold either the nut N or the nut N² in engagement with one or the other of the screws; and to automatically shift the nuts from one screw to the other I provide the base A² with cam projections m' m^2 , which engage the nut-carrying arm N' when the slide G reaches the limit of its movement. This is a convenient feed-screw-shifting mechanism; but any other suitable feed-screw-shifting device may be employed for this purpose.

To enable the plate-holder carriage or slide G to be returned to position without turning either of the feed-screws, I provide it with a pull-rod G', by which the slide may be reciprocated on the guides F F' when the nuts N N² are both out of engagement with the feed-screws M M'.

P is a condenser, mounted in a hinged plate P', secured to the back side of the case A, opposite the lens B, and which is adapted to be moved into line therewith over the opening p in the case when the apparatus is desired to be used for enlarging and projecting successive pictures already taken. For thus enlarging and projecting successive pictures the operation of the apparatus is the same as when employed for taking pictures, the only difference being that for the sensitive plate or film in the holder H a similar plate or film having the successive photograph pictures or prints in a similar spiral is substituted.

When the apparatus is being used for taking pictures, the opening p is closed light-tight by the shutter formed integral with the condenser-carrying plate P'. The plate, film, or picture holder H is held in position in the ring H² by one or more buttons or clips h^4 . The successive pictures X upon the plate or film or surface H' are, it will be seen, arranged in a continuous spiral path or row, which may have any desired number of turns or coils. The shaft F is driven from the driving-shaft F² by intermeshing gears f f' , and the shaft F³ of the screw M' is driven from the shaft F² by a gear f^2 meshing with the gear f .

F⁴ is a crank for turning the driving-shaft.

I claim—

1. In an apparatus for taking or enlarging and projecting successive pictures of moving objects, the combination with a lens and an intermittently-operating shutter, of an intermittently-rotating and rectilinear-moving plate, film or picture holder, substantially as specified.

2. In a successive picture taking or projecting apparatus, a rectilinear-moving and intermittently-rotating holder for the picture plate or film, whereby successive pictures on its surface are successively exposed in a continuous spiral, substantially as specified.

3. The combination with a reciprocating slide or carriage, of an intermittently-rotating film, plate or picture holder mounted thereon, substantially as specified.

4. The combination with a reciprocating slide or carriage of an intermittently-rotating film, plate or picture holder mounted thereon, a lens and an intermittently-operated shutter, substantially as specified.

5. The combination with a lens of a shutter, a rectilinear-moving slide, and an intermittently-rotating holder for the plate or film mounted on said slide, substantially as specified.

6. The combination with a lens of a shutter,

a rectilinear-moving slide, and an intermittently-rotating holder for the plate or film mounted in said slide, and a feed-screw for operating the slide, substantially as specified.

5 7. The combination with a lens of a shutter, a rectilinear-moving slide, and an intermittently-rotating holder for the plate or film mounted in said slide, a feed-screw for operating the slide, and mechanism for intermittently rotating said holder, substantially as specified.

15 8. The combination with a lens of a shutter, a rectilinear-moving slide, and an intermittently-rotating holder for the plate or film mounted in said slide, a feed-screw for operating the slide, mechanism for intermittently rotating said holder, and means for intermittently operating said shutter, substantially as specified.

20 9. The combination with a lens, of a shutter, a feed-screw, a rotary ring plate-holder provided with teeth on its periphery, a feed-slide, and a worm-cam engaging said teeth on said holder, substantially as specified.

25 10. The combination with a feed-slide of a worm-cam and an intermittently-rotating plate-holder having teeth engaging said worm-cam, substantially as specified.

30 11. The combination with a feed-slide having a ring to receive a rotating ring plate-holder, of a rotating ring plate-holder, means for operating said feed-slide, and means for intermittently rotating said holder, substantially as specified.

35 12. The combination with a feed-slide having a ring to receive a ring-shaped holder, a

rotating ring-shaped holder provided with teeth on its periphery, a feed-screw, and a worm-cam for intermittently rotating the holder, substantially as specified.

13. The combination with a two-part opening and closing case, of a lens, a screw, a shutter, a feed-slide, guides for said slide, a screw for operating said slide, a stationary ring on the slide, a rotary ring-shaped holder, and a worm-cam, substantially as specified.

14. The combination with a two-part opening and closing case, of a lens, a screw, a shutter, a feed-slide, guides for said slide, a screw for operating said slide, a stationary ring on the slide, a rotary ring-shaped holder, a worm-cam, and a condenser in the back side of said case, substantially as specified.

15. The combination with a case of a lens, a shutter, a condenser in the back side of the case, and an intermittently-rotating rectilinear-moving holder whereby the same apparatus may be used both for taking and enlarging and projecting successive pictures of moving objects, substantially as specified.

16. The combination with a case of a lens, a shutter, a slide or carriage, a rotary holder mounted thereon, mechanism for intermittently rotating said holder, and means for feeding said slide in both directions as the holder rotates to enable the same apparatus to present the same pictures in their direct or reverse order, substantially as specified.

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Witnesses:

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