

**No. 663,785.**

**Patented Dec. 11, 1900.**

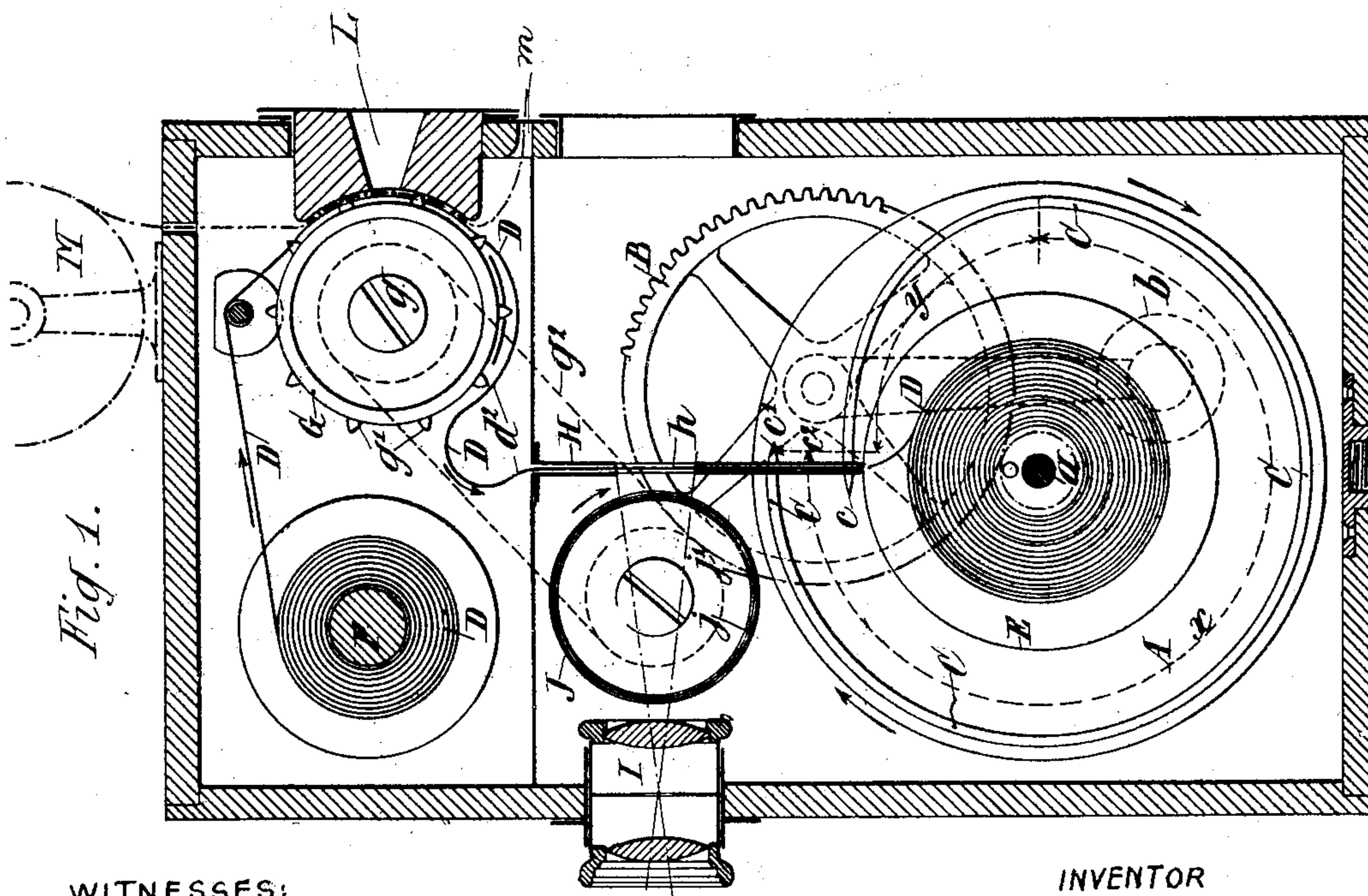
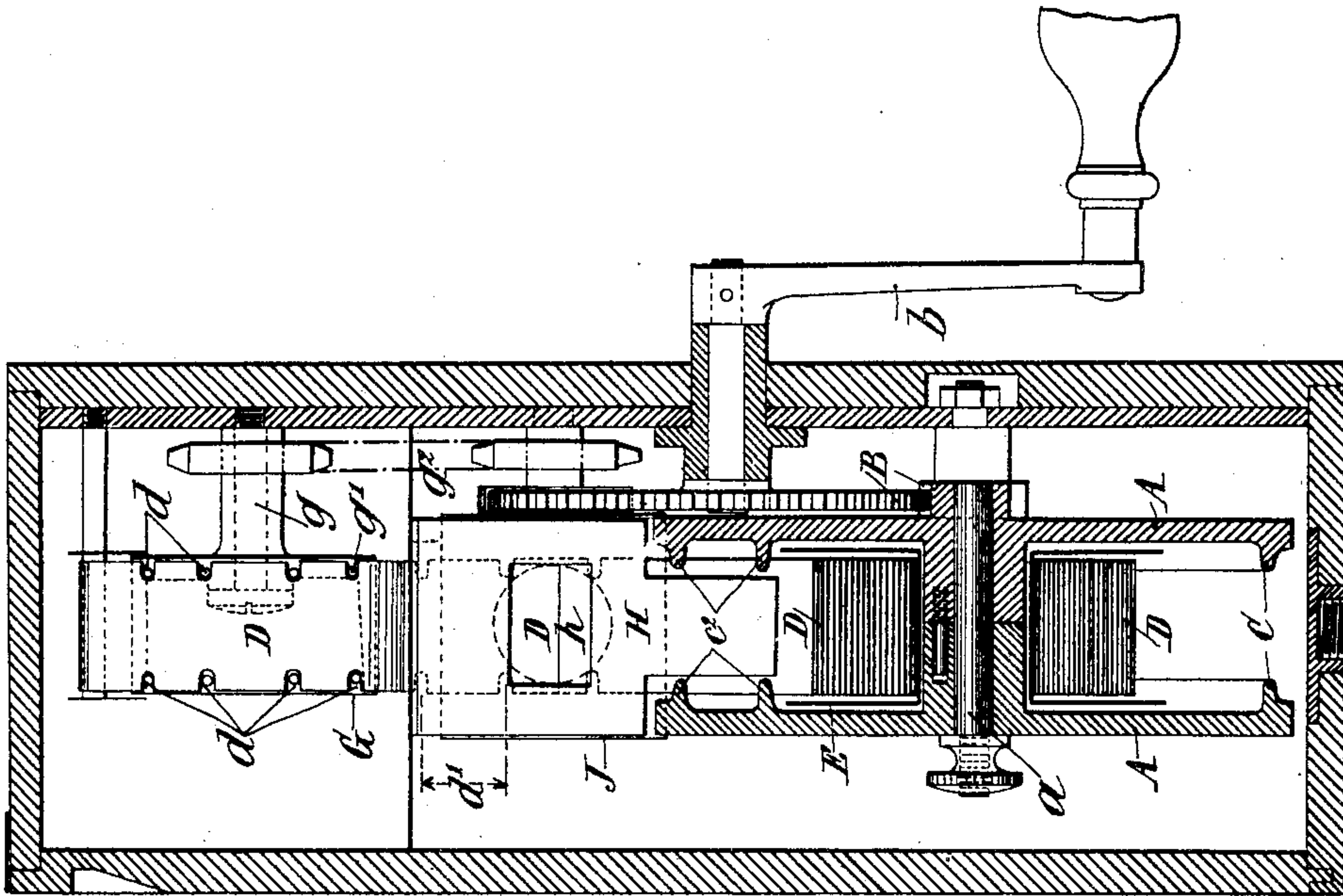
# E. L. REULOS.

## KINEMATOGRAPHIC APPARATUS.

(Application filed May 29, 1899.)

(No Model.)

**2 Sheets—Sheet 1.**



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Fig. 5.

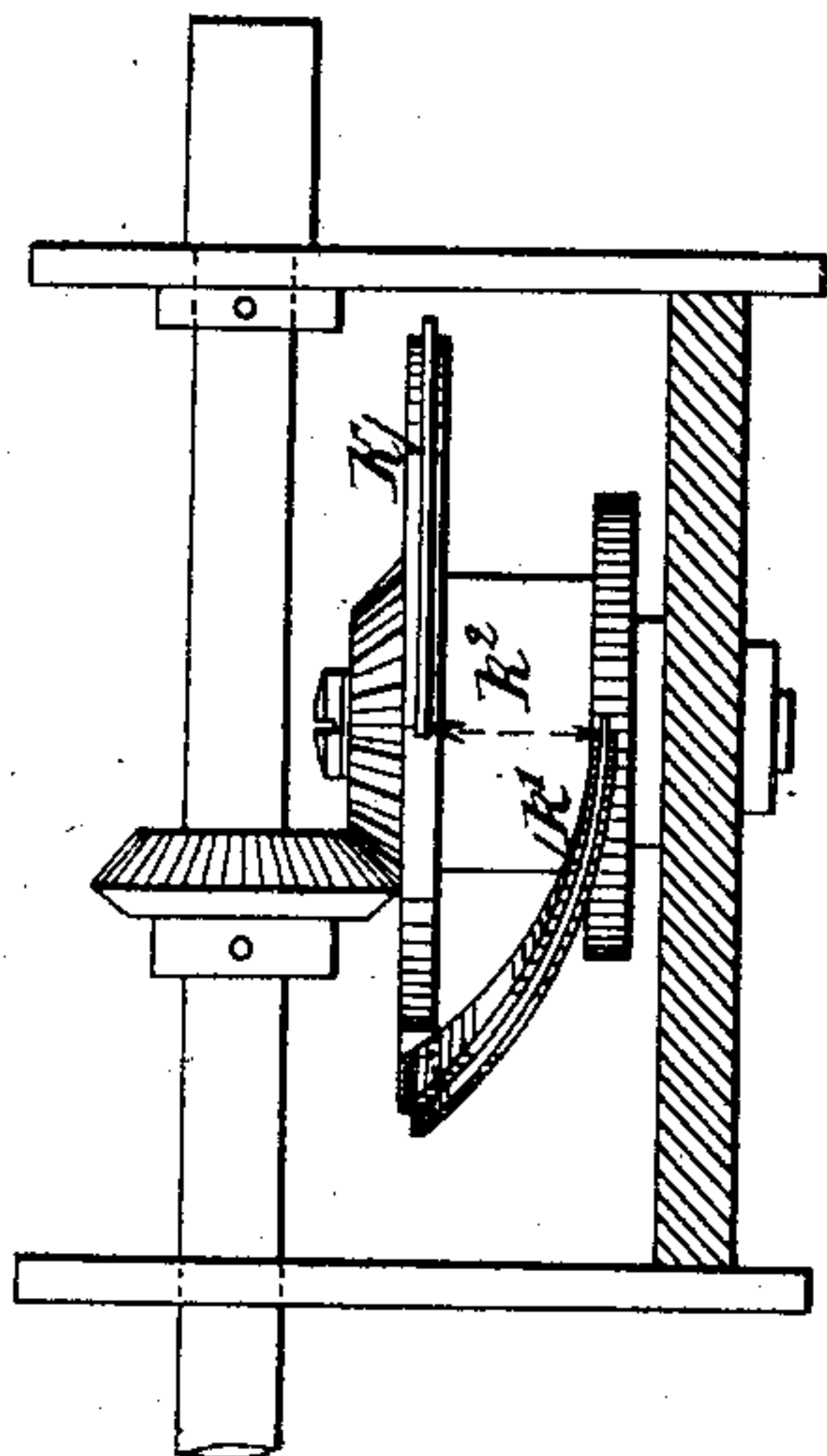


Fig. 3.

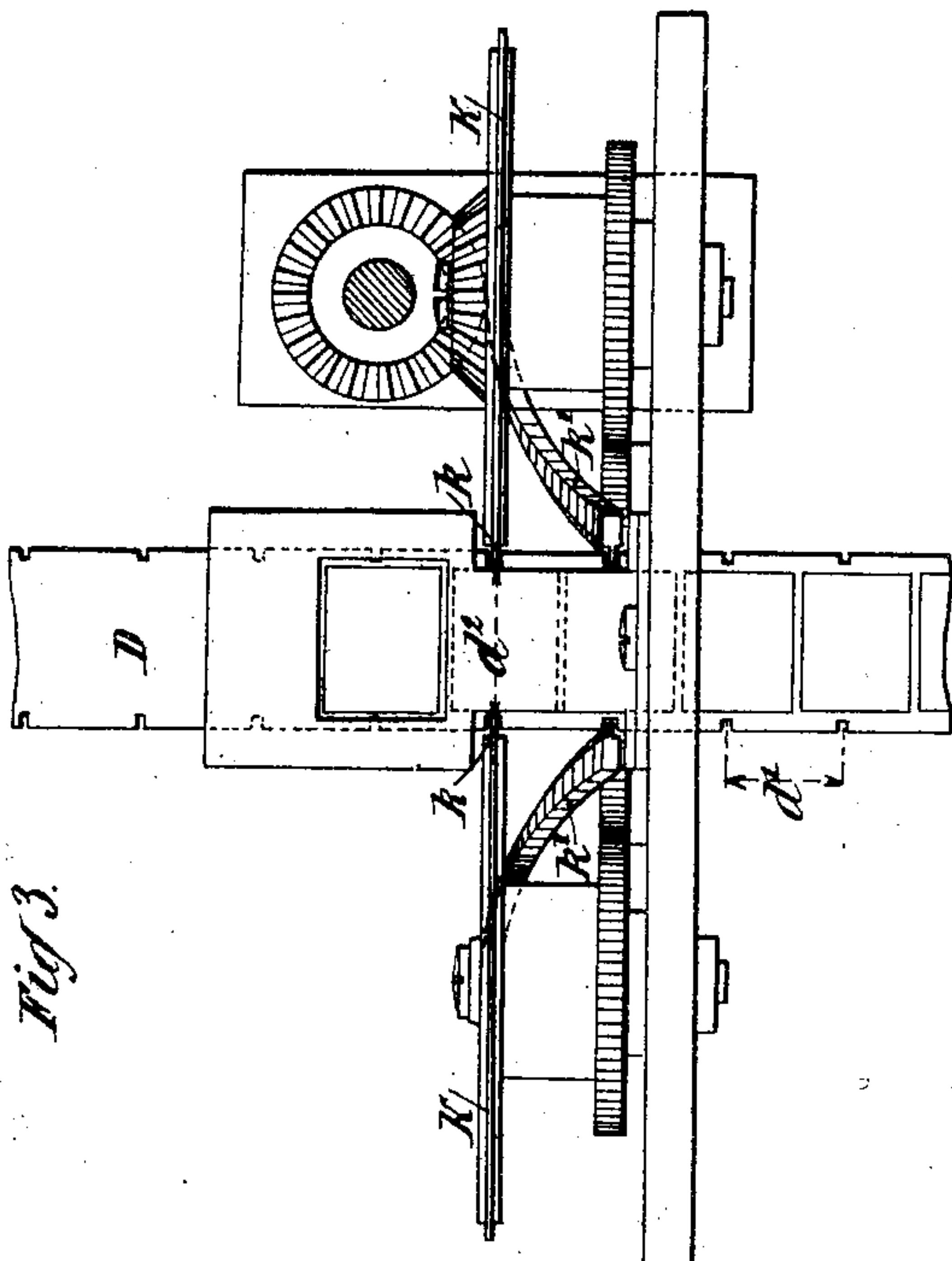
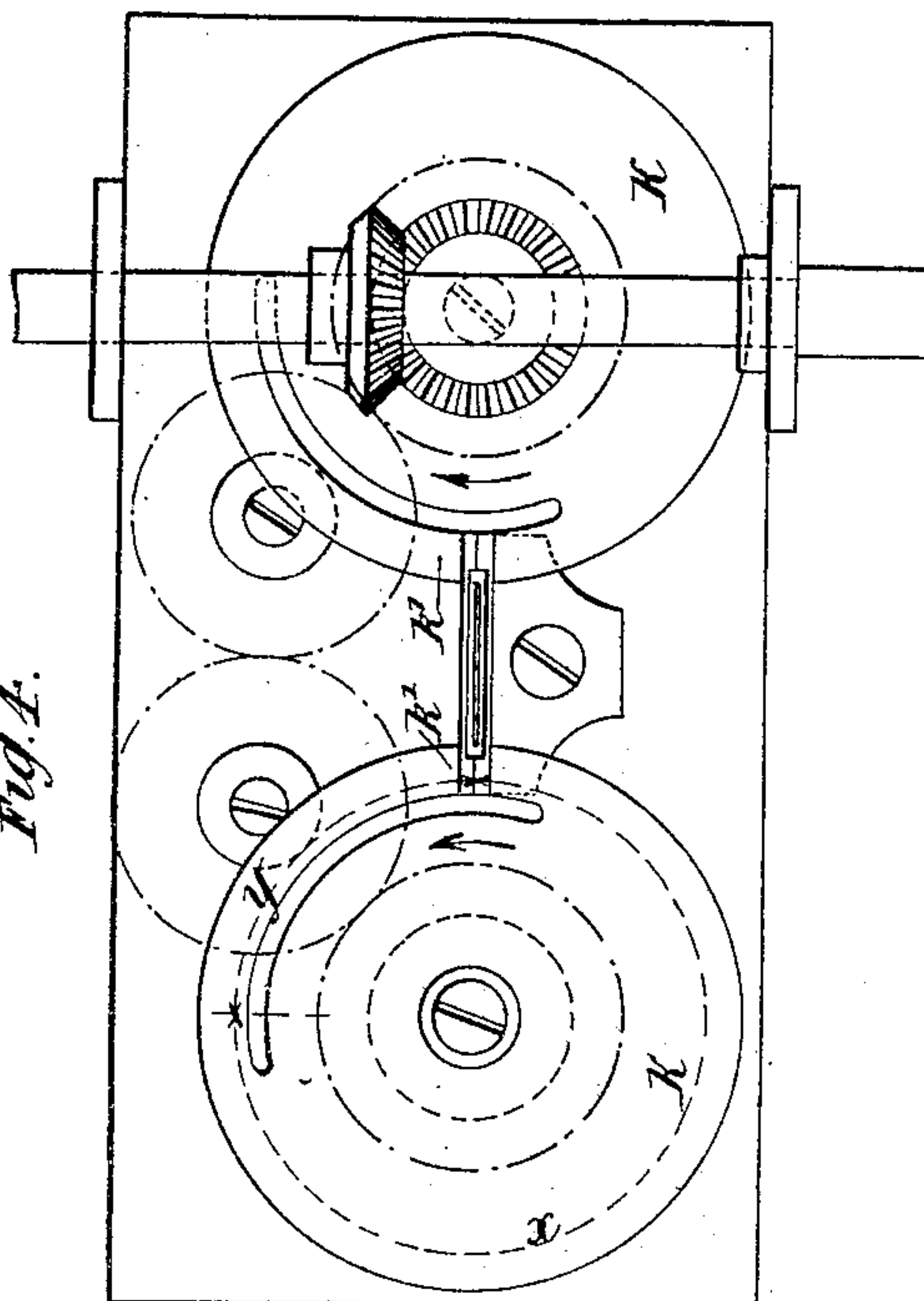


Fig. 4.



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# UNITED STATES PATENT OFFICE.

EUGÈNE LUCIEN REULOS, OF PARIS, FRANCE.

## KINEMATOGRAPHIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 663,785, dated December 11, 1900.

Application filed May 29, 1899. Serial No. 718,742. (No model.)

*To all whom it may concern:*

Be it known that I, EUGÈNE LUCIEN REULOS, a citizen of the Republic of France, and a resident of Paris, France, have invented certain Improvements in Kinematographic Apparatus, of which the following is a specification.

The object of this invention is to produce simple kinematographic apparatus in which the film is unrolled continuously, but is moved and rolled up intermittently, notwithstanding the fact that all the parts of the apparatus are moving continuously. My invention is applicable either to kinematographic cameras or kinematographic projectors for projecting pictures.

In the accompanying drawings, Figure 1 is a vertical section of the apparatus, Fig. 2 being a transverse section of the same. Figs. 3, 4, and 5 represent a modification in an essential part of the apparatus, Fig. 3 being a front elevation, Fig. 4 a plan, and Fig. 5 a side elevation.

The apparatus, Figs. 1 and 2, consists, essentially, of two circular rotating plates A A, mounted on an axle  $a$ , which may receive rotary motion in any convenient manner—for instance, by means of a train of gearing operated by the handle  $b$ . The plates A have on their inner faces a projection or rib  $c$  of special form. This rib for about three-quarters of its length (the portion marked  $x$ ) takes a circular course concentric with the axis of the plate, and then for the portion marked  $y$  it curves inward toward the center, stopping at a point  $c$  slightly beyond a radial line drawn through the point of departure at  $c'$ . These plates A A are keyed on the axle in such a manner that the ribs correspond exactly.

The film D employed with this apparatus is formed with notches  $d$   $d$  at equal distances apart, and this distance  $d'$  must correspond with the distance apart of the two ends of the rib  $c$ . The plates are set at a suitable distance apart, so that the film D will pass readily between them, the chisel-shaped point of the rib engaging in the notches  $d$   $d$ .

On the axle  $a$  and between the plates A A is mounted, with slight friction, the bobbin E.

The film D, which is wound on a bobbin or

roller F, passes to a cylinder G, mounted on an axle  $g$  and provided with teeth  $g'$ , which engage with the notches  $d$ . Then it passes through a guide H, having a suitable opening, so that the light emanating from the objective I can play upon the film, and it is then wound upon the bobbin E. A rotating shutter J, intended to periodically intercept the light, is operated by a train of gear B, the same as the cylinder G, with which the shutter J is connected by a chain  $g^2$  or in any other convenient manner.

The working of the apparatus is as follows: The plates being driven, (which movement is communicated to the shutter J and cylinder G,) the film is drawn forward by the latter and is rolled upon the bobbin E. This rolling up is, however, intermittent, and this result is obtained by means of the rib or projection C. While the circular part  $x$  of the rib C is passing through the notches  $d$  of the film no movement of the film takes place, and the light is free to act on the film, the shutter J being also withdrawn; but when the other part  $y$  of the rib C comes into operation the film is drawn briskly forward and is rolled upon the bobbin E, the quantity corresponding to the distance between the extremities  $C^1$  and  $C^2$  of the rib C, a distance which also corresponds with the width of the particular picture. During this time the shutter J will be closed. Then the film stops and the shutter opens, and so on.

It may be remarked that as the cylinder G moves continuously there will be at one time a loose portion  $d'$  of the film, which thus provides for the almost instantaneous rolling up of the film during the moving phase and without strain on the film, the fact that the bobbin E is mounted with but slight friction on the axle  $a$  being also conducive to this end. The rib C should be chisel-pointed, so that the point will always take into the notches  $d$  of the film. As the ends of each rib C overlap, Fig. 1, the advancing ends  $c'$  always enter the next pair of notches before the previous pair of notches leave the ends  $c$  of the ribs, and consequently these feed-plates always maintain control of the film. The film also moves freely in the guide H, so that there



is no friction, and the film will not cut or be otherwise injured and will therefore last a much longer time than is usual.

The rotary shutter J consists of two cylinders  $j j'$ , each provided with two openings and capable of turning one on the other, so as to regulate the size of the opening through which the light passes according to requirements.

The essential part of this apparatus—that is to say, the two plates provided with ribs—may be produced in other ways. Thus two plates K K, Figs. 3, 4, and 5, instead of being parallel are placed in the same plane at a distance apart corresponding to the width of the film, (see  $d^2$ .) A rib  $k$  on the edge of each plate plays the same part as the rib C on the face of the plates A. Each plate is cut for a part of its circumference, so as to form a tongue  $k'$ , which is of sufficient length and is bent downward a distance equal to the distance between two notches of the film, forming a portion of a helix, so that as these plates K rotate the tongues  $k'$ , working in the notches  $d$ , serve to move the film forward the required distance.

It may be here remarked that the plates may be replaced by cylinders on the outside of which the ribs are secured.

It will of course be obvious that as it is the bent part of the ribs which acts on the films the remaining portions of the ribs may, if desired, be dispensed with.

I can adapt to my apparatus an arrangement for taking positive pictures. To this end a piece L is arranged in front of the cylinder G, such piece being provided with a suitable opening through which light may strike on the film as it passes over the cylinder. The sensitive film is rolled upon the cylinder F, and a negative film is wound on the bobbin M. From this bobbin it passes to the cylinder G, where it comes into intimate contact with the sensitive film, being drawn forward

with the latter by the teeth  $g$ , and it passes out of the apparatus at  $m$ . The positive impression can thus be effected very simply.

When a negative film is to be made, the openings L and  $m$  will of course be closed.

I would here remark that I do not wish to confine myself to the particular details of construction shown and described, which may obviously be varied within considerable limits.

I claim—

1. Means for effecting the intermittent advance of cinematographic films, and consisting essentially of a film having regularly-spaced notches in its edges, in combination with surfaces carrying two ribs placed at a certain distance apart, and between which the notched film passes, and means for imparting continuous rotary movement to the said surfaces, the said ribs entering the notches in the film, and so bent as to a portion of their length that the film shall remain stationary for the greater part of the rotation of the plates, and shall receive a forward motion during the remaining portion of the rotation, substantially as described.

2. In a cinematographic apparatus, two parallel plates A A, provided on their adjacent faces with ribs C C, which are concentric with the axes of the plates as to a portion of their length, but are curved or bent as to another portion of their length to intermittently feed the film by engaging its notched edges, in combination with a receiving-bobbin, a toothed feeding-cylinder for the film and a shutter, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EUGÈNE LUCIEN REULOS.

Witnesses:

EDWARD P. MACLEAN,  
GUSTAVE DUMONT.