

J. J. DEBRIE.
 APPARATUS FOR TAKING KINEMATOGRAPH VIEWS, ALSO AVAILABLE AS AN ORDINARY
 PHOTOGRAPHIC APPARATUS.

APPLICATION FILED SEPT. 11, 1909.

1,087,083.

Patented Feb. 10, 1914.

4 SHEETS—SHEET 1.

Fig. 1.

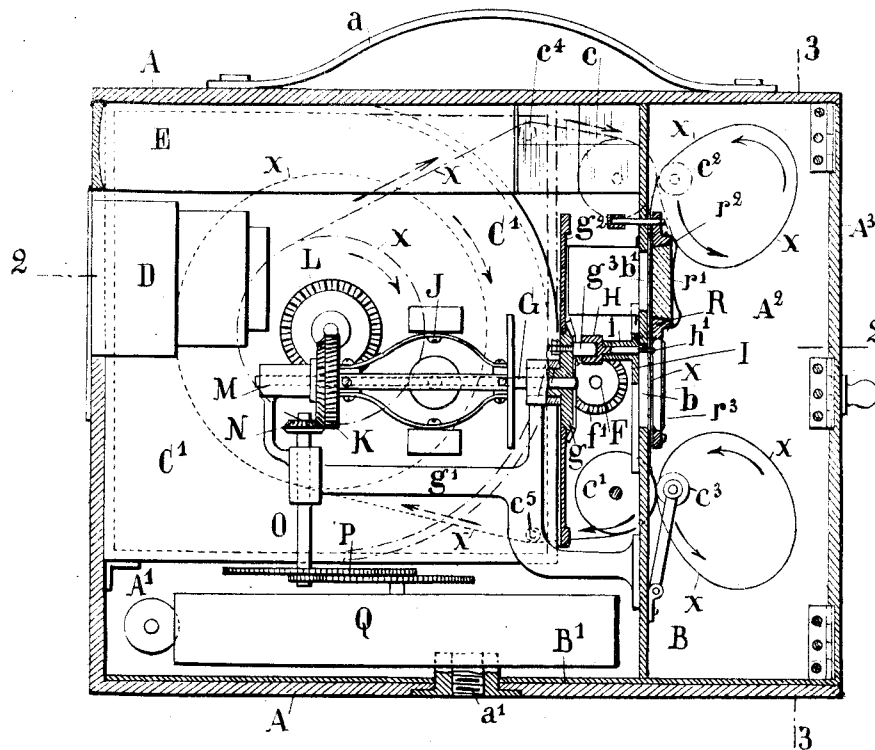
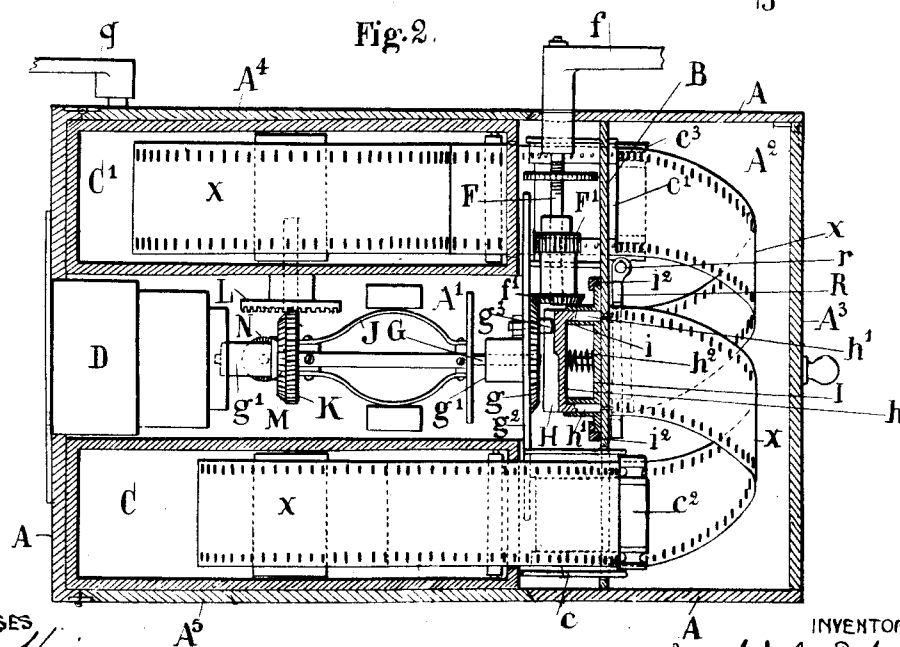


Fig. 2.



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Fig. 7.

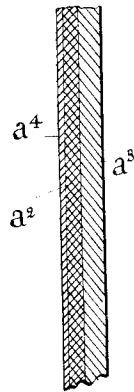


Fig. 3.

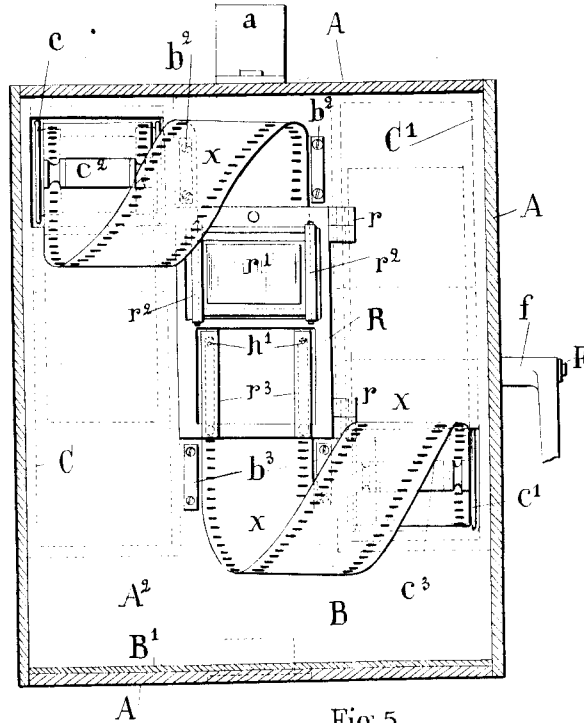


Fig. 4.

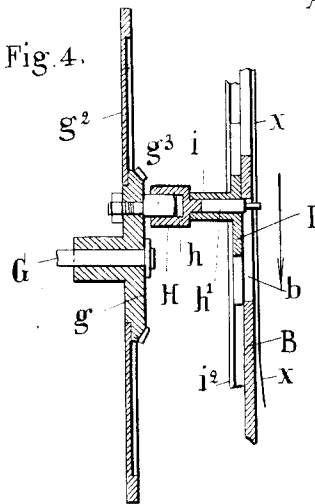


Fig. 5.

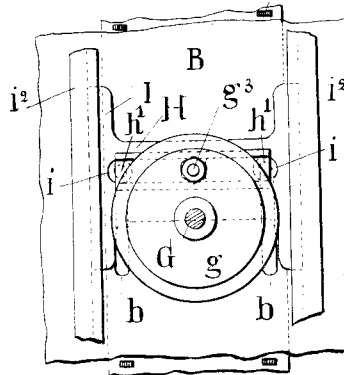
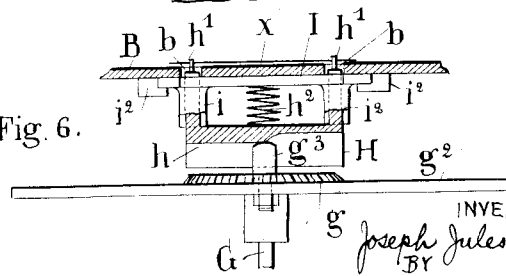


Fig. 6.



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4 SHEETS—SHEET 3.

Fig. 8.

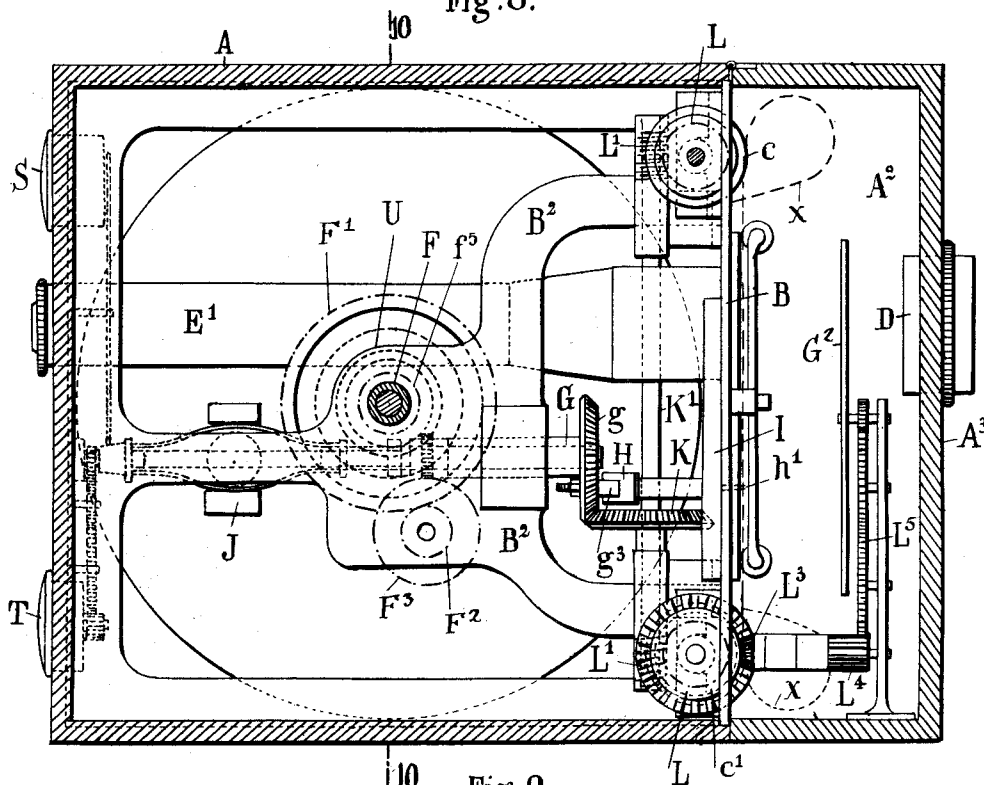
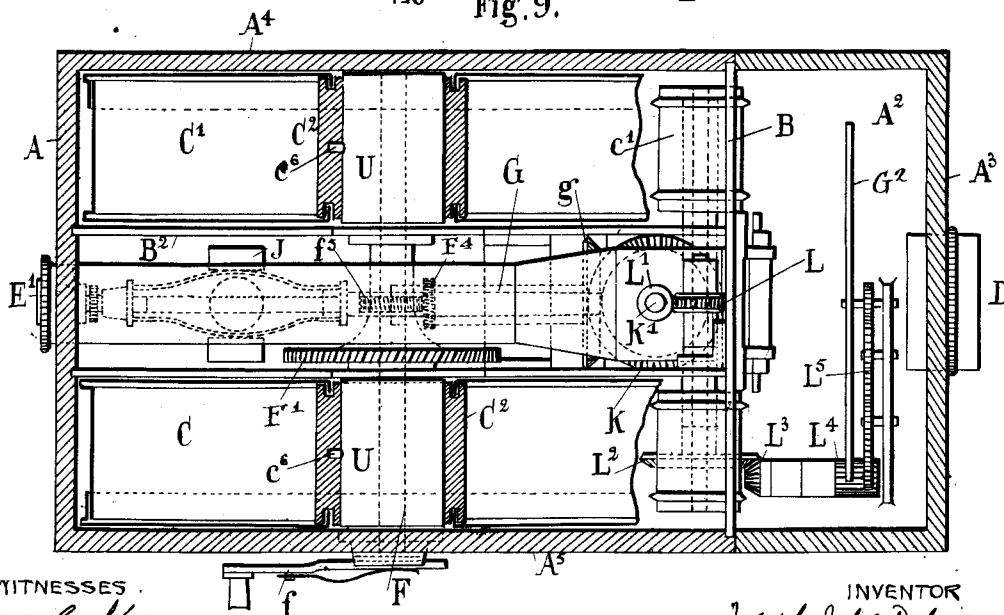


Fig. 9.



WITNESSES

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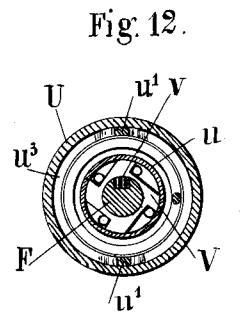
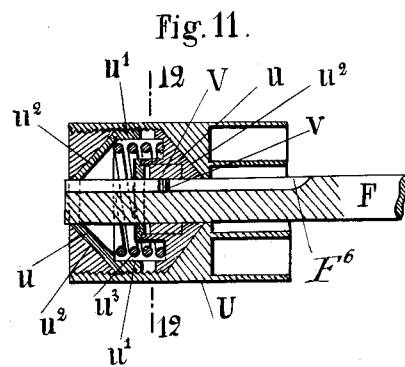
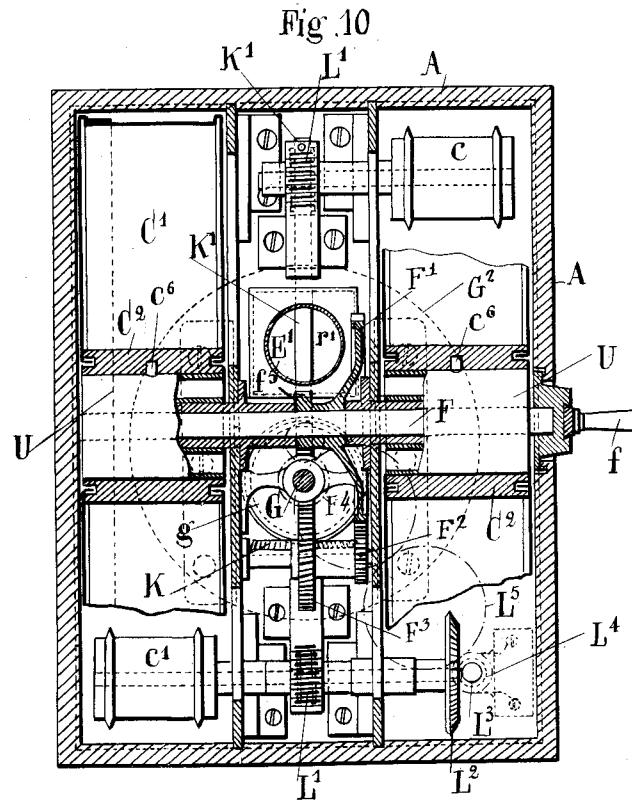
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APPARATUS FOR TAKING KINEMATOGRAPH-VIEWS, ALSO AVAILABLE AS AN ORDINARY PHOTOGRAPHIC APPARATUS.

1,087,083.

Specification of Letters Patent.

Patented Feb. 10, 1914.

Application filed September 11, 1909. Serial No. 517,281.

To all whom it may concern:

Be it known that I, JOSEPH JULES DEBRIE, a citizen of the Republic of France, and a resident of Paris, France, have invented a new and useful Apparatus for Taking Kinematograph-Views, also Available as an Ordinary Photographic Apparatus, of which the following is a specification.

Heretofore the apparatus employed for taking kinematograph views have necessitated the employment of special stands by reason of their size and weight thereby rendering them heavy, bulky and difficult to transport.

In the apparatus which forms the object of the present invention while obtaining the same results as with the known apparatus it presents the advantage that on account of its small size which is at most that of a $\frac{1}{2}$ detective apparatus it can be transported very readily and utilized with or without a stand; it may likewise be operated either automatically or by hand which enables the same to take pictures if desired of the person operating the camera, the film in this case unwinding automatically.

This apparatus is particularly adapted for use in connection with kinematographic reporting and for tourists who can use it either as an ordinary photographic apparatus for photographing fixed objects or as a kinematograph apparatus for taking animated pictures.

In order that the invention may be clearly and readily understood an apparatus with its principal parts is represented in two embodiments by way of example in the accompanying drawing, in which:—

Figure 1 is a longitudinal sectional elevation of the apparatus. Fig. 2 is a sectional plan on the line 2—2 in Fig. 1. Fig. 3 is a cross section on the line 3—3 in Fig. 1. Figs. 4, 5 and 6 are detail views to a larger scale illustrating in side elevation, front elevation and plan respectively the parts serving for feeding the film. Fig. 7 likewise shows to a larger scale the assemblage of materials which together form the walls of the box of the apparatus. Fig. 8 is a longitudinal section of a modified form of this apparatus. Fig. 9 is a sectional plan. Fig. 10 is a cross section on the line 10—10 in Fig. 8. Fig. 11 is a longitudinal section of one of the friction members serving for winding the band of film. Finally Fig. 12

is a cross section on the line 12—12 in Fig. 11.

In all these figures the same letters of reference designate the same parts.

The apparatus is formed of a rectangular box A which has fitted on its upper part a handle *a* for the purpose of transportation and at its lower part a screw threaded socket *a'* serving for fixing it upon a photographic stand. This box A is constituted by walls formed of a sheet of asbestos *a*² arranged between an impermeable card or board *a*³ and a plate *a*⁴ (Fig. 7) which may be perforated or not as desired; the sheet of asbestos is employed for the purpose of protecting the interior of the apparatus from heat, the board for preventing moisture from entering and the plate for imparting to the assemblage of parts absolute rigidity and strength. In addition the box A is composed of two internal chambers A' A² of different dimensions which are separated one from the other by means of a partition B mounted vertically on a horizontal plate B' resting upon the bottom of the box A. At its upper part the chamber A' comprises longitudinal walls provided with doors A⁴ A³ and two boxes C C' for the film *x*; these boxes are situated in the same plane so that between them and the partition B sufficient space is left for the objective D, the view finder E and all the parts for starting the apparatus, and for clamping and exposing the band of film *x*, the greater number of these parts being supported by the partition B and the plate B'. These parts are composed of two ordinary feed rollers *c c'* arranged directly behind the delivery and receiving boxes C C' for the film *x* the roller *c* being arranged at the upper part and the roller *c'* at the lower part.

A transverse shaft F to which a crank handle *f* is externally fitted carries a pinion *f'* which meshes with a gear wheel *g* keyed on a longitudinal shaft G. This shaft G is mounted upon a support *g'* fixed to the vertical partition B or in any other convenient manner. The gear wheel *g* integral with a shutter plate *g*² carries a crank pin *g*³ engaged in a groove H with a rectilinear cam *h* provided with pins *h'* *h'* moving in vertical slots *b* formed in the partition B and entering the holes in the band of film *x*. This groove H is held by its pins *h'* *h'* engaged in sleeves *i* cast on a movable part I

held in slots z^2 against the vertical partition B. A spring h^2 constantly holds the groove H of the cam h against the crank pin g^3 .

5 Upon the longitudinal shaft G an ordinary governor J is mounted together with a worm wheel K meshing with the gear wheel L keyed on the shaft of the film roller in the receiving box C' and a bevel wheel M
10 meshes with a pinion N keyed upon a vertical shaft O carrying a set of gearing-up wheels P controlled by a barrel spring Q arranged at the lower part of the chamber A'. The spring Q serves as an operating
15 source of power. A small handle q arranged outside the apparatus serves for winding the said spring Q.

Fixed to the partition B of the chamber A² is a tension gate R with hinges r carrying
20 the glass r' and provided with springs r^2 r^2 arranged opposite the aperture b' serving for pressing the glass r' against the film; it likewise carries springs r^3 serving to hold the band of film x against the said
25 partition B during the exposure. Two small rollers c^2 c^3 are likewise fixed upon the partition B which serve to hold the band x against the delivery rollers c' c . Finally the chamber A² communicates with the exterior by means of the rear wall A³ which is
30 hinged and closed light-tight while the apparatus is operative.

Operation: The apparatus being charged and the band of film x previously arranged
35 as indicated in the accompanying drawing that is to say, passing from the delivery box C to the receiving box C' in forming an upper loop and a lower loop and passing over the roller c^4 between the rollers c and
40 c^2 , the guides b^2 b^2 , the partition B and the gate r , the guides b^3 b^3 and the rollers c' and c^3 , and finally over the rollers c^5 (as indicated by the arrows in Fig. 1) the pictures can be taken. If it is desired to operate the
45 apparatus by hand it is first of all arranged on a stand or other object for the purpose of fixing it securely; the mechanism is then actuated by means of the handle f , the pinion f' of the shaft F then drives the
50 toothed wheel g and the governor J of the shaft G. By means of its stud g^3 engaged in the groove H of cam h the wheel g drives the cam and feeds the band of film x by means of its pins h' h' , engaged in the holes
55 in the band; the movable part I likewise participates in this movement. When this feed movement is at an end, that is to say when the pins h' h' have reached the bottom of their respective openings b , formed in the
60 partition B (the displacement of these pins h' h' being equal to one-half the circular movement of the gear wheel g) the stud g^3 leaves the boss on the cam h and under the influence of the spring h^2 produces a re-
65 tractive movement of the cam h , which thus

liberates the pins h' h' from the holes in the band of film x and momentarily produces a stoppage of the band sufficient for taking the picture, the shutter g^2 integral-with the wheel g presenting its aperture in front of the objective during this period. The wheel
70 g continuing its circular movement causes all the said mechanism to participate in an upward movement, the stud g^3 again ascending upon the boss of the rectilinear cam h automatically replaces the pins h' h' in the holes in the band of film x and again
75 causes the latter to advance. At the same time that this movement is effected the worm wheel K drives the wheel L which continuously winds the band of film upon the roller of the receiving box C'. If it is desired to automatically operate the ap-
80 paratus without a stand the pinion N is engaged with the wheel M by displacing the shaft O, and the barrel spring Q which drives the entire mechanism is released.

In the modified construction represented in Figs. 8-12, the box A, while preserving the same dimensions has undergone some
90 general modifications; the rear part A² forming the chamber A² opens on hinges arranged at the upper part and becomes the front portion of the apparatus; it carries the objective D which is thus arranged in front
95 of the band of film x , this combination resulting in obtaining a very short focus so that wide angle lenses may be used; owing to this arrangement the shutter G² is arranged between the objective D and the band
100 of film x . The box A comprises at its middle and in line with the glass r' a tube E' serving for focusing the objective D; it likewise comprises at its rear part a speed indicator S and a measuring device T. The
105 shaft F with crank f serving to control the whole of the mechanism for displacing the band of film is mounted on two cheeks B² B² integral with the partition B and passes through the hub of the delivery and receiving boxes C C' for the band of film x . This
110 shaft F by means of the gear wheels F', F², F³, F⁴ drives the bevel wheel g mounted on the shaft G and carrying the crank stud g^3 serving to operate the pin driving mechanism h' h' ; it also drives the delivery rollers
115 c c' by the intermediary of the bevel wheel K meshing with the wheel g , worms L' L' mounted at the extremities of a vertical shaft K' these worms meshing with the worm wheels L L' keyed on the shaft of the delivery rollers c c' serving for the unwinding and the winding up of the band of film x upon the hubs C² C² of the boxes C C'. The shaft
120 F likewise controls the shutter G² by means of the bevel wheel L² keyed at the end of the shaft of the delivery roller c' and meshing with a pinion L³ transmitting its movement to a set of gear wheels L⁵ by means of the
125 pinion L⁴. When it is necessary to reduce

the speed of the apparatus for another kind of work the control is effected directly by displacing the wheel F^4 movable on the shaft G which leaves the wheel F^3 and meshes with a pinion F^5 integral with the gear wheel F' of the shaft F with crank F. The measuring device T is controlled by the intermediary of a train of gear wheels and of a small pinion mounted at the rear extremity of the shaft G. The shaft F with crank f carries on either side cheeks B^2 B^2 friction boxes U upon which the hubs C^2 C^2 of of the boxes C C' for the band of film are mounted, and held by means of pins c^0 c^0 . These friction boxes U which assist in the unwinding and winding of the band of film α , when the apparatus is operative are arranged in such a manner that they act in opposite directions that is to say during normal operation it is the friction of the receiving box C' which is operative, while during reversed running this box becomes loose on the shaft F and the friction of the delivery box C becomes operative. This box U (Figs. 11 and 12) is provided internally with two friction cones u u one of which carries two claws u' u' engaged in corresponding recesses in the other cone in such a manner that they are driven simultaneously; they are both applied to the inner conical walls u^2 u^2 of the box U by the action of a spring u^3 ; one of these cones u carries in a cavity a ball driving pawl V provided with a pin v engaged in a groove F^c in the shaft F. It will readily be understood that when the shaft F rotates in the direction of normal running indicated by the arrow in Fig. 12 only the pawl V rotating freely in the cavity in the cone v is driven by the shaft F with which it is still connected by means of the pin v engaged in the groove F^c ; the result is that the box U rigid with the hub C^2 is loose upon its shaft and the cones exert no action. If, on the other hand it is desired to run the apparatus backward the shaft F rotating in the opposite direction to that indicated in the drawing by the arrow in Fig. 12 and the pawl V being wedged in this movement by its balls, will drive the cones u u which acting simultaneously by friction upon the conical parts u^2 u^2 will drive the box U and the hub C^2 .

It will of course be understood that the invention is not confined to the examples illustrated and that it may comprise any modifications which do not affect its principle. Thus the device producing the automatic movement may be constructed in any other manner; for example it may be arranged beneath the apparatus in a separate box or it may be arranged at a distance and connected by a flexible transmission.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A kinematograph apparatus compris-

ing a casing, rotary film carriers on opposite sides thereof and between which the film is conducted in spiral loops from the top of one to the bottom of the other, an objective focusing upon a field of exposure between the film carriers, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other and means for intermittently advancing the film across this field of exposure.

2. A kinematographic camera having a crank shaft for actuating the film, a friction box at each end of the crank shaft and hubs on the film rolls engaged thereby, substantially as and for the purpose described.

3. A kinematograph apparatus comprising a casing with central objective and film chambers on opposite sides thereof, film carriers arranged in said chamber to respectively deliver and receive the kinematograph film, in combination with means for driving said film carriers, substantially as described.

4. A kinematograph apparatus comprising a casing with central objective and film chambers on opposite sides thereof, film carriers arranged in said chamber to respectively deliver and receive the kinematograph film, in combination with means for driving said film carriers in opposite directions, substantially as described.

5. A kinematographic apparatus comprising a casing, film chambers at substantially the same level on opposite sides of the casing and between which the film is conducted in spiral loops, an objective focusing upon a field of exposure between the film chambers, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one chamber to the other, together with means arranged between the chambers for intermittently advancing the film.

6. A kinematograph apparatus comprising a casing, rotary film carriers on opposite sides thereof and between which the film is conducted in spiral loops from the top of one to the bottom of the other, an objective focusing upon a field of exposure between the film carriers, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other and means for intermittently advancing the film across this field of exposure, together with means for continuously rotating the film carriers to respectively pay off and take up the film.

7. A kinematograph apparatus comprising a casing, rotary film carriers lying in substantially parallel planes on opposite sides thereof and between which the film is conducted in spiral loops from the top of one to the bottom of the other, an objective focusing upon a field of exposure between

the film carriers, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other and means for intermittently advancing the film across this field of exposure.

8. A cinematograph apparatus comprising a casing, rotary film carriers axially aligned on opposite sides thereof and between which the film is conducted in spiral loops from the top of one to the bottom of the other, an objective focusing upon a field of exposure between the film carriers, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other and means for intermittently advancing the film across this field of exposure.

9. A cinematograph apparatus comprising a casing, rotary film carriers journaled on a common spindle on opposite sides thereof and between which the film is conducted in spiral loops from the top of one to the bottom of the other, an objective focusing upon a field of exposure between the film carriers, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other and means for intermittently advancing the film across this field of exposure.

10. A cinematograph apparatus comprising a casing, a partition dividing the same into separate chambers, rotary film carriers lying in substantially parallel planes on opposite sides of one chamber and between

which the film is conducted in spiral loops through the second chamber, an objective focusing upon a field of exposure between the film carriers and at said partition, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other, together with means for intermittently advancing across this field the portion of the film intermediate the carriers.

11. A cinematograph apparatus comprising a casing, a partition dividing the same into separate chambers, rotary film carriers lying in substantially parallel planes on opposite sides of one chamber and between which the film is conducted in spiral loops through the second chamber, an objective focusing upon a field of exposure between the film carriers and at said partition, means for receiving and maintaining the spirally twisted film flat at this point in its passage from one carrier to the other, together with means for intermittently advancing across this field the portion of the film intermediate the carriers, together with means for continuously rotating the carriers to pay off and take up the film, substantially as described.

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

JOSEPH JULES DEBRIE.

Witnesses:

CHARLES DOUY,
EUGENE HEURET.