

No. 645,949.

Patented Mar. 27, 1900.

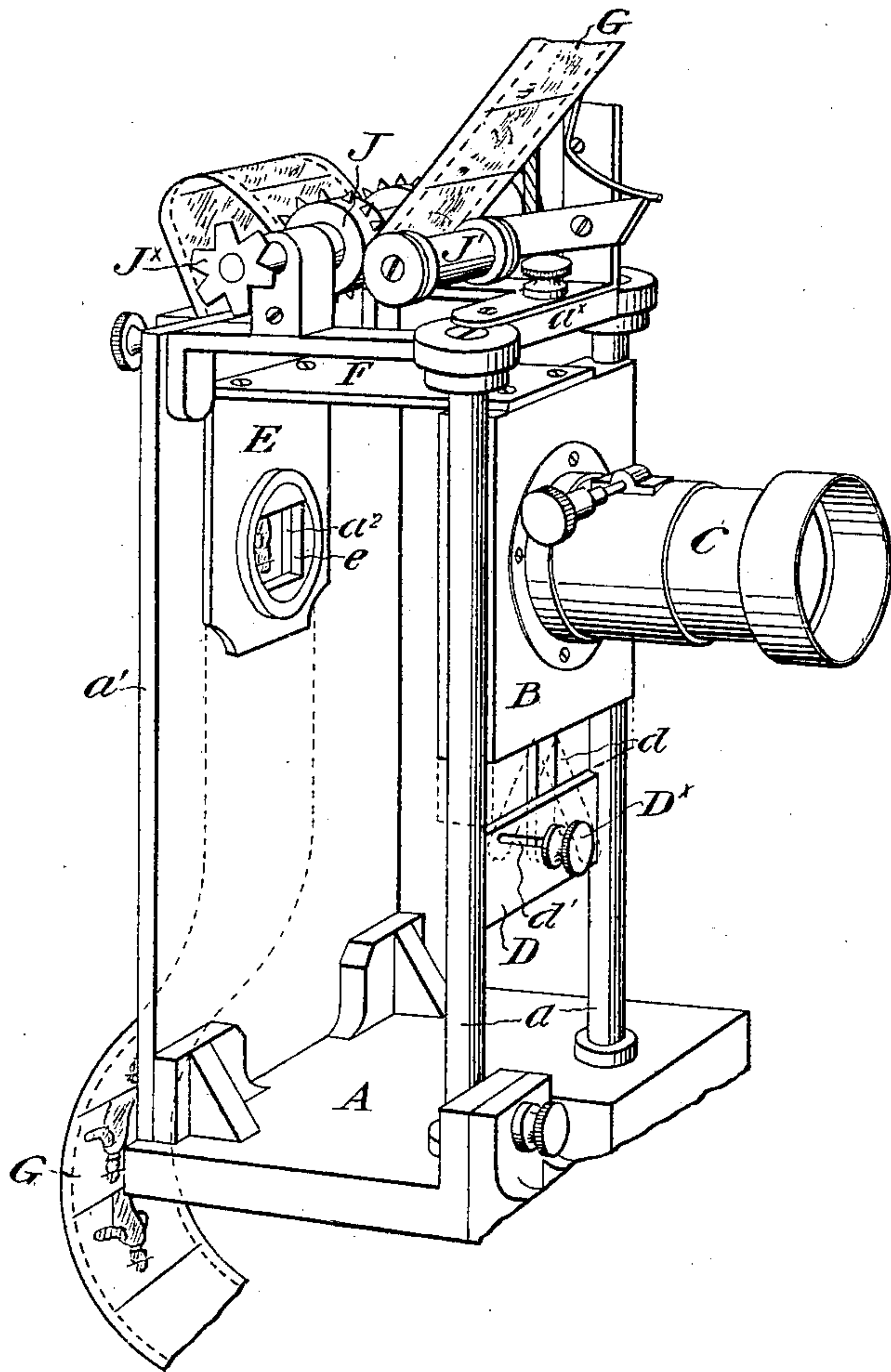
J. J. FRAWLEY.
PROJECTION APPARATUS.

(Application filed Apr. 17, 1899.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.



WITNESSES:

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INVENTOR:

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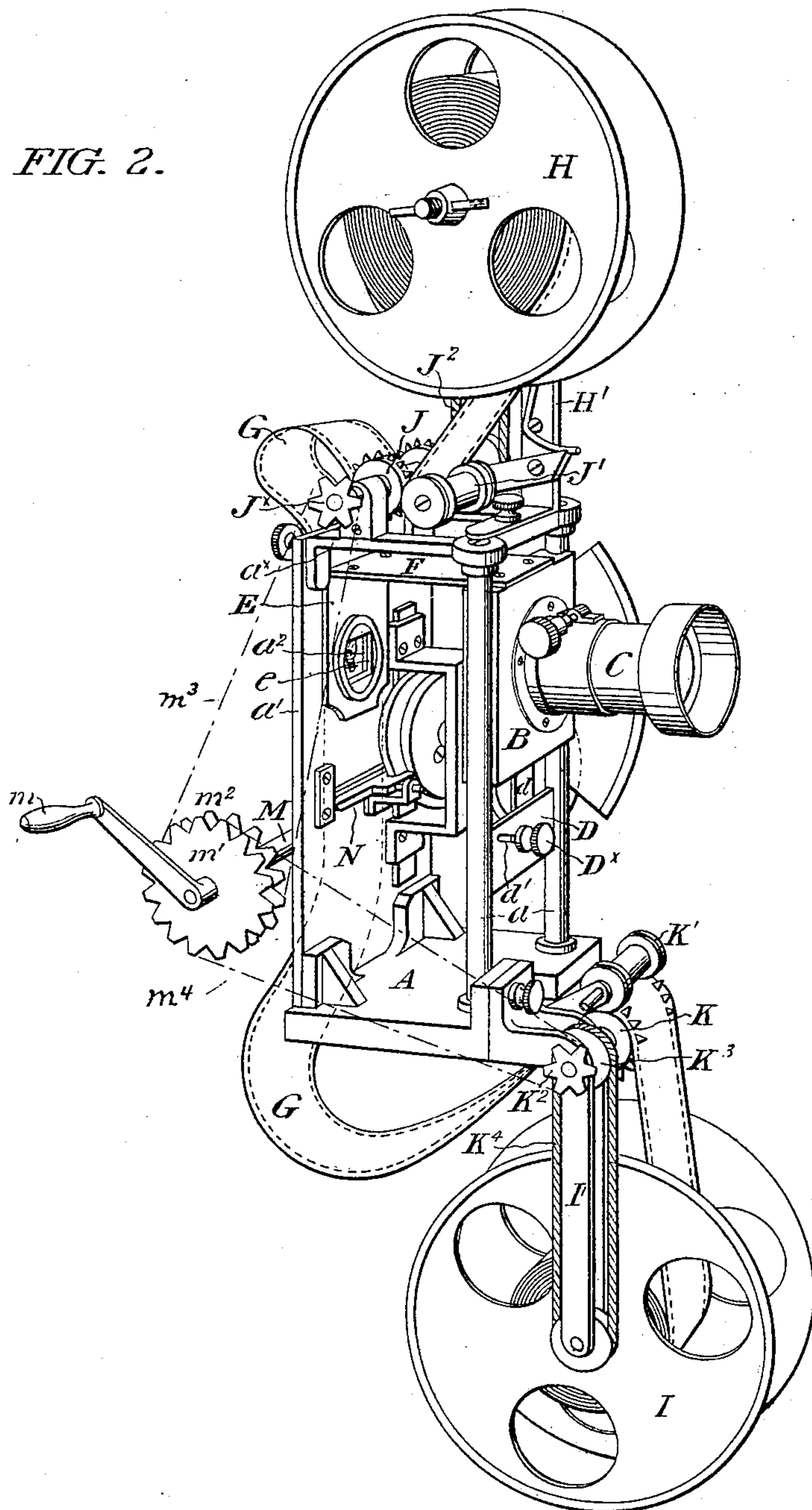
J. J. FRAWLEY.
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(No Model.)

2 Sheets—Sheet 2.

FIG. 2.



WITNESSES:

H. Norman Dixon
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INVENTOR:

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UNITED STATES PATENT OFFICE.

JOHN J. FRAWLEY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
SIEGMUND LUBIN, OF SAME PLACE.

PROJECTION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 645,949, dated March 27, 1900.

Application filed April 17, 1899. Serial No. 713,302. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. FRAWLEY, a citizen of the United States, residing in the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Projection Apparatus, of which the following is a specification.

My improvements relate to apparatus for projecting upon a screen, seriatim, a number of photographs, taken one after another, of an object in motion, with the result that as the views appear upon the screen, in rapid succession, they form what are popularly known as "life motion pictures."

My invention aims to provide a simple and inexpensive apparatus of this class, more certain in operation than apparatus of similar general character as heretofore constructed, and in which certain difficulties and imperfections incident to prior constructions are avoided.

In the accompanying drawings I show, and herein I describe, a good form of a convenient embodiment of my invention, the particular subject-matter claimed as novel being hereinafter definitely specified.

In the drawings,

Figure 1 is a view in perspective of the lens and frame plates and the framework on which they are mounted.

Figure 2 is a view in perspective of certain of the parts illustrated in Figure 1, drawn, however, on a somewhat smaller scale than the corresponding parts as shown in Figure 2, and illustrating in connection therewith the film spools and the rolls through which the film passes.

Similar letters of reference indicate corresponding parts.

Apparatus of the character to which my invention relates is so well known in the art that I deem it superfluous to illustrate and describe the remaining portions of the machine, including the lamp and its casing, the stand, the mechanism for adjusting the lamp, &c. Suffice it to say that my improvements may be incorporated in and employed in connection with a projecting apparatus of any ordinary character.

In the accompanying drawings,

A is a fixed standard constituting the framework of that part of the apparatus near which

my improved devices are located, consisting of a base-plate, provided with two uprights $a a$, and a standard plate a' erected in position some little distance back of said uprights $a a$, and connected to said uprights by a top frame a^x .

The standard plate a' is provided with an elongated opening a^2 , which extends from a point near its upper end to a point in the vicinity of or below its center.

B is what I term a lens-carrying plate, shown in the drawings as fitted between the uprights $a a$ and having recesses in its opposing edges which embrace said uprights and adapt it to be moved vertically with relation to them.

C is a lens tube of usual construction, mounted in the central portion of said lens-carrying plate B, and equipped with the usual object lens.

D is a gage plate fixedly secured to the framework A, and conveniently, as shown in the drawings, disposed between the lower portions of the uprights $a a$, and fixedly secured thereto, said gage plate being provided with an inclined or oblique slot d' .

d is a link the upper end of which is pivotally connected to the lens-carrying plate, and the lower end of which is engaged by a thumb screw D^x , the shank of which extends through the slot d' , and the enlarged head of which is adapted when the shank is screwed home, to bind against the front face of the gage plate, and fixedly secure the lower end of the link at any point in the length of said inclined slot, and in consequence secure the lens carrying plate at any desired point in its range of vertical movement.

E is what I term the frame plate, the same being a plate of opaque material embodying a central aperture e of any suitable diameter, mounted in front of the standard plate a' with its opening e in registry with the opening a^2 , and the lens tube, and adapted for movement up and down said standard plate in consonance with the movement of the lens carrying plate B.

The light of the lamp situated at the rear of the standard plate a' , passes through the opening a^2 , the opening e , and the lens tube, and is of course in the operation of the apparatus thrown upon a screen suspended in front of the lens tube. The opening in the

frame plate however determines the form of the "sight" of the picture thrown on the screen, the outline of the whole picture being that of the opening e , the shadow which on the screen surrounds the picture as a whole, and which is caused by the interception of the light rays by the portions of the plate E adjacent to the opening e , constituting the "frame" so to speak of the picture.

The frame plate is to be moved up and down in concert with the lens carrying plate, and I prefer to secure this concerted movement by rigidly connecting said frame plate to the lens carrying plate by a supporting bracket F, being a plate or structure of rigid material fixedly secured as to its respective ends to the upper portions of said plates B and E respectively.

In the operation of an apparatus of this general character, a film G is continuously fed past the opening a^2 in the standard plate, and, a strong light being thrown from a lamp of any usual construction, situated at the rear of said plate, and the rays of which are as stated, directed through the opening a^2 , the opening of the frame plate, and the lens tube, the pictures or photographs or markings upon the film will be thrown upon the screen.

The pictures or sets of markings formed upon the film, are of uniform size, and follow each other in close succession, and in the operation of the apparatus the film is fed forward in a step by step manner, with the result that each picture pauses for a selected period in line with the lens, and the film is then rapidly shifted to substitute the next adjacent picture for it, and so on.

It is important that the pictures should when they come to rest, (their position when they come to rest or in appropriate position to be projected upon the screen, being herein termed the "exposure or projection point") be exactly centered with relation to the frame plate opening and the lens, which, ordinarily, are set when the film begins to move, and remain in set position during the entire running of the film.

In practice, however, it frequently occurs that as the film moves along, the pictures successively presented in front of the frame plate fail to center with its opening but come to rest in a position above or below the center of such opening, this being due to slight irregularities in the film itself, or slight differences in its tension, or misadjustment of the film moving apparatus.

Hitherto, when this has occurred, resort has been had to the expedient of moving the frame plate slightly up or down as the case might be, to cause the opening in the frame plate to register properly with the picture; but, inasmuch as the lens tube has been fixed, such expedient has been of little remedial effect, because both the picture and its frame are then slightly out of line with the lens tube and lens.

The construction which I have devised pro-

vides a movable frame plate and a movable lens carrying plate, associated in such manner that the opening in the frame plate is in registry with the bore of the lens tube, and said frame plate and lens carrying plate are adapted to be together moved easily and quickly up or down, with the result that when in the movement of the film the pictures are slightly above or slightly below the center of the opening in the frame plate, said plate and the lens carrying plate may be moved together slightly up or slightly down to bring them into line with the pictures in their new position.

As a result of this arrangement, said frame opening and said lens follow, so to speak, the pictures, to any deranged position which they may occupy when they come to rest, and said pictures when thrown upon the screen, occupy the center of the frame, and receive the full benefit of the enlarging power of the lens, because said lens has been moved to a position in proper focus with said picture.

The lens carrying plate and the frame plate may, in the form of apparatus shown in the drawings, be moved to a new position to accommodate any derangement of the pictures on the film, during the time that the film is passing through the machine and without interruption of its travel. This adjustment is accomplished by slightly rotating to the left, the head of the screw D^x , and sliding it to the right and down the inclined slot d' , thereby, through the link d , drawing the plates B E downward, or sliding it to the left and up said slot, and thereby elevating said plates B E.

As soon as the frame plate opening and lens are brought into registry with the pictures the plates B E are secured in their new position by screwing home the screw D^x .

H is a spool upon which the film to be exhibited is originally wound, or over which it travels, said spool being shown as supported in any convenient manner upon the upper end of an upright H' mounted upon the frame A.

I is a spool, originally empty, upon which the film is wound or over which it passes, after it is unwound from the spool H and passed between the lamp and the object lens.

Said spool I is conveniently supported upon a depending arm I' , secured to the framework A.

J J' are a pair of film feeding rolls supported upon the framework A and between which the film G passes. Said rolls are preferably recessed, so to speak, at their central portions, so as not to press upon or mar the pictures on the film.

The roll J is provided at each end with a series of spurs so located as to register with and take into marginal openings in the film, and thereby occasion the positive travel of the latter.

Annular recesses are formed in the roll J' for the accommodation of said spurs.

J^x is a sprocket or chain wheel mounted on one extremity of the axle of the roll J.

A band J^2 passes around the other extremity of said axle, and about the axle of the spool H.

K K' are a pair of film feeding rolls disposed at the lower portion of the frame A. Said rolls are similar to the rolls J J' recessed at their central portions.

The roll K is provided at each end with a series of spurs so located as to register with and take into marginal openings in the film G, and also take into annular recesses formed in the roll K'.

The axle of the roll K is provided with a sprocket or chain wheel K^2 , and is also provided with a band wheel K^3 .

K^4 is a band which passes about said band wheel and also passes about the axle of the spool I.

M is the main driving shaft of the device, conveniently supported at the rear of the standard plate a' , and provided with a crank handle m , and two chain wheels m' m^2 .

A chain, omitted for clearness of illustration, but indicated by the dotted line m^3 , connects the chain wheel m^2 with the chain wheel J^x ,—and a second chain, omitted for clearness of illustration, but indicated by the dotted line m^4 , connects the chain wheel m' with the chain wheel K^2 .

By virtue of this chain connection the feed rolls J J' and K K' are positively operated in absolute consonance with each other and the main shaft M, and the regularity of the travel or feed of the film is insured.

Mechanism, conveniently mounted upon the plate a' , and operated in any suitable manner from the main driving shaft M, operates to take hold of and feed the film step by step downwardly past the frame plate; such mechanism may be of any preferred construction, and I therefore do not illustrate or describe it.

In harnessing the apparatus I draw from the spool H sufficient of the film to form a loop between the rolls J J' and the rolls K K', part of said loop existing above the step by step mechanism, and part below it.

When then rotation is imparted to the shaft M, it is also, through the chains, imparted to the rolls J J' and K K' which are thus rotated at precisely the same speed, and feed the film at a rate which is the same at which the step by step apparatus advances the film passing through it.

It is manifest that the spools H I may be, instead of true spools upon which the film is wound or accumulated,—mere rollers over which the film travels in passing to and from the step by step mechanism.

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

1. In a projection apparatus, in combination, a fixed framework, mechanism for feeding in succession to a selected exposure or

projection point a series of film pictures, a lens carrying plate mounted on said framework in vertically movable relationship with respect to it and to the exposure or projection point of the pictures, a frame plate provided with an opening and also mounted on said framework in vertically movable relationship with respect to it and to the exposure or projection point of the pictures, and means for securing said plates in various positions of vertical adjustment with respect to their support and the exposure or projection point of the pictures, substantially as set forth.

2. In a projection apparatus, in combination, a supporting frame, mechanism for feeding in succession to a selected exposure or projection point a series of film pictures, a lens carrying plate mounted on said frame in vertically movable relationship with respect to it and the exposure or projection point of the pictures, a frame plate, having a frame opening, mounted on said frame in vertically movable relationship with respect to it and the exposure or projection point of the pictures, a connection between said plates, and means for securing said plates in various positions of vertical adjustment with respect to the exposure or projection point of the pictures, substantially as set forth.

3. In a projection apparatus, in combination, a framework, mechanism for feeding in succession a series of film pictures, a lens carrying plate movable vertically with respect to the framework, a vertically movable frame plate rigidly connected with said lens carrying plate, and means whereby said lens carrying plate may be secured in various positions of vertical adjustment, substantially as set forth.

4. In a projection apparatus, in combination, a lens carrying plate adapted to move vertically, a frame plate adapted to move vertically, a connection between said lens plate and said frame plate, a link connected to one of said devices, a gage plate having an oblique slot, and a set screw passing through said slot and entered in said link, substantially as set forth.

5. In a projection apparatus, in combination with the framework, a lens carrying plate adapted to move vertically thereon, a frame plate having an opening and adapted to move vertically thereon, a rigid connection between said lens plate and said frame plate, a link connected to one of said devices, a gage plate having an oblique slot, and a set screw passing through said slot and entered in said link, substantially as set forth.

In testimony that I claim the foregoing as my invention I have hereunto signed my name this 12th day of April, A. D. 1899.

JOHN J. FRAWLEY.

In presence of—

F. NORMAN DIXON,
THOS. K. LANCASTER.