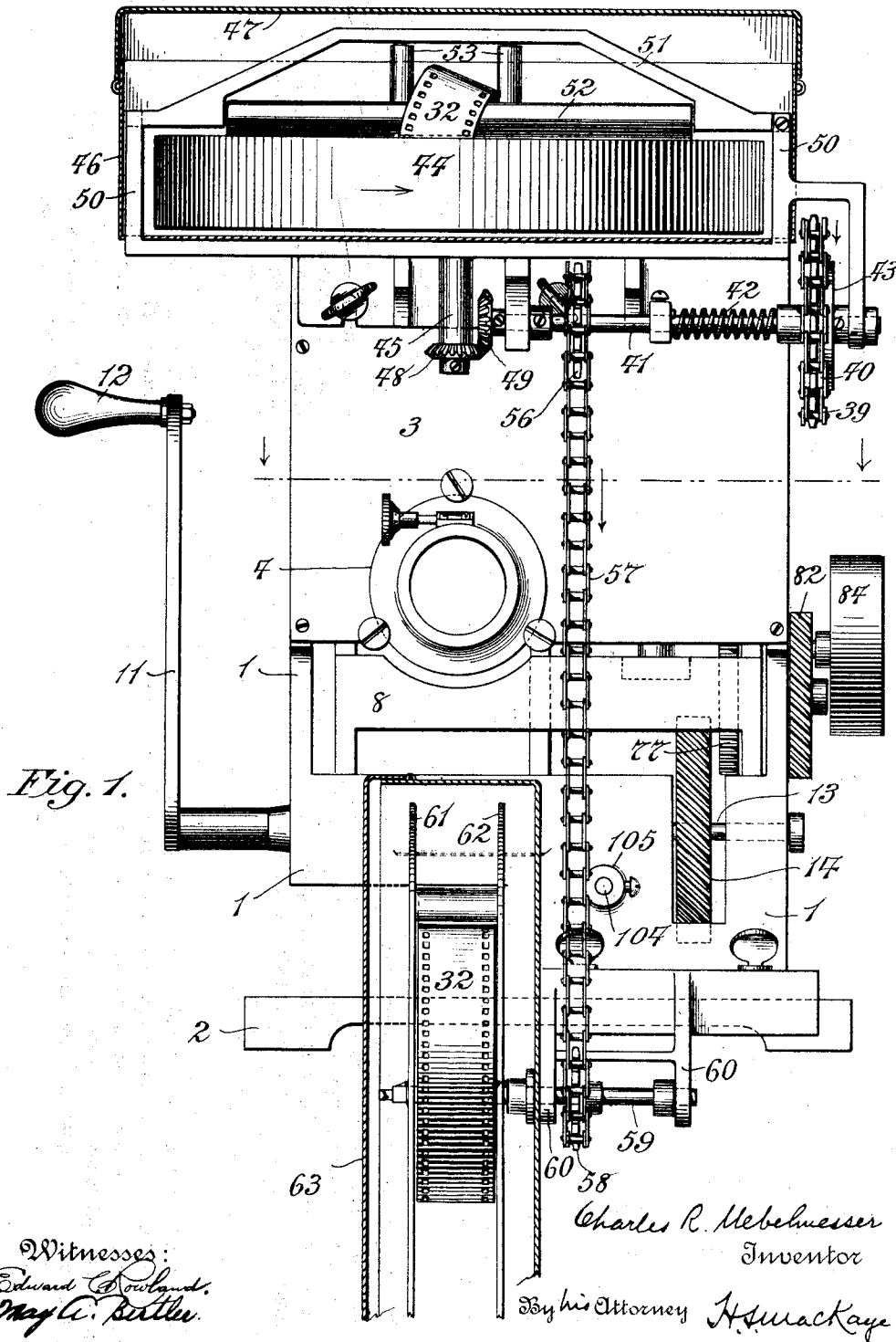


C. R. UEBELMESSER.
MOVING PICTURE MACHINE.
APPLICATION FILED APR. 28, 1908.

1,023,053.

Patented Apr. 9, 1912.

8 SHEETS—SHEET 1.



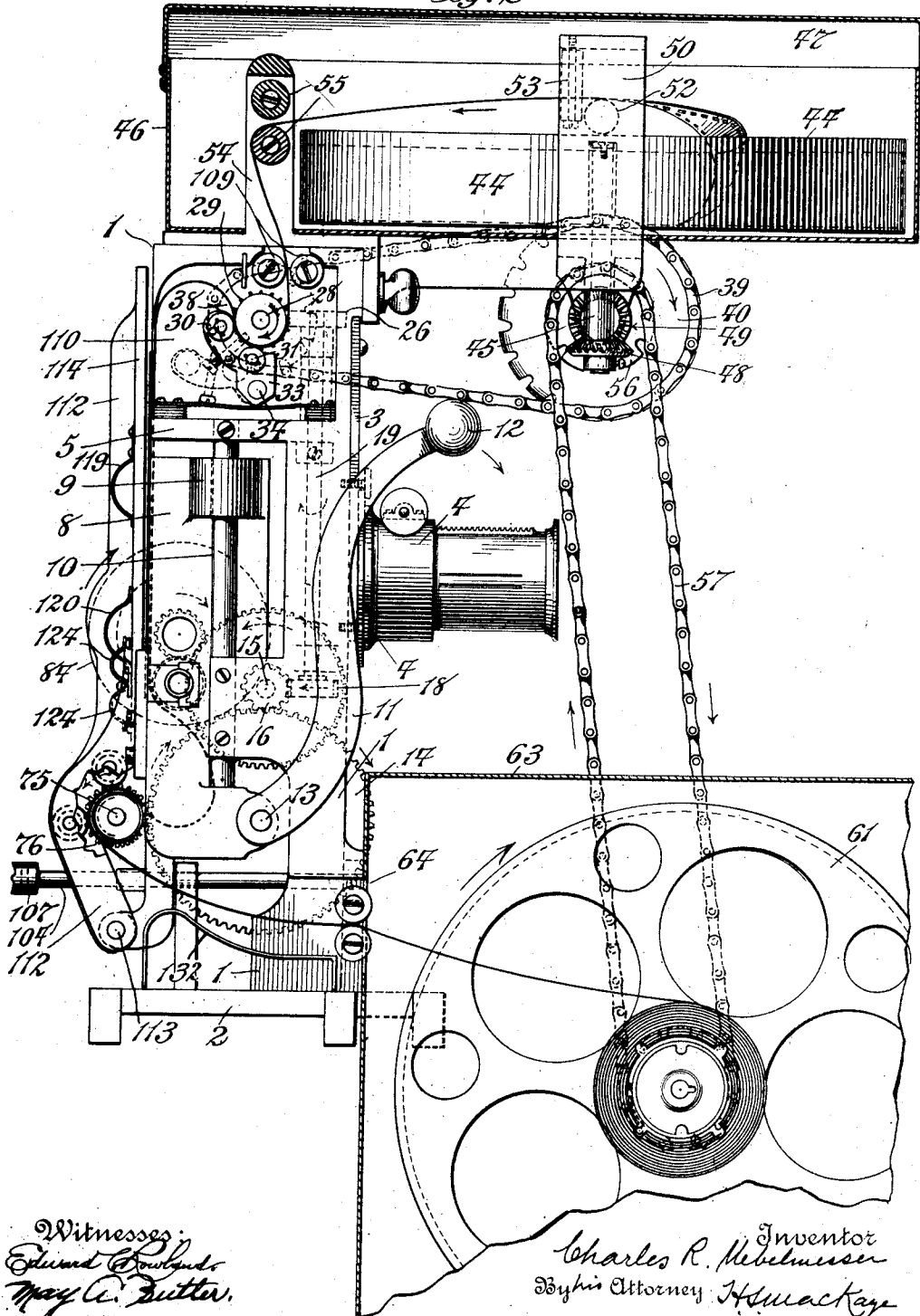
Witnesses:
Edward C. Dowland.
May C. Butler.

1,023,053.

Patented Apr. 9, 1912.

8 SHEETS—SHEET 2.

Fig. 2



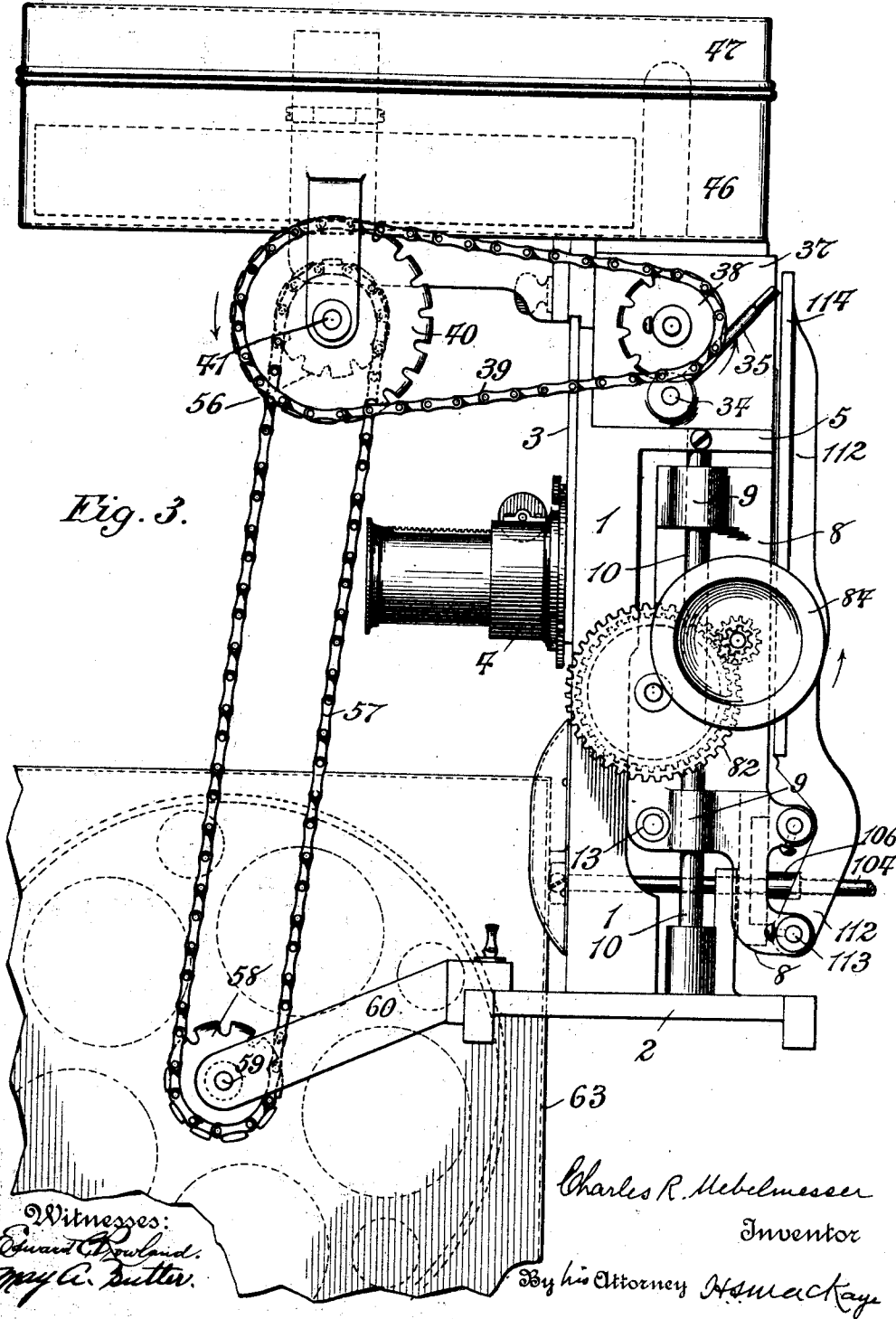
Witnesses:
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Charles R. Uebelmesser, Inventor
By his Attorney, H. M. Mackay.

1,023,053.

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8 SHEETS—SHEET 3.



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8 SHEETS—SHEET 4.

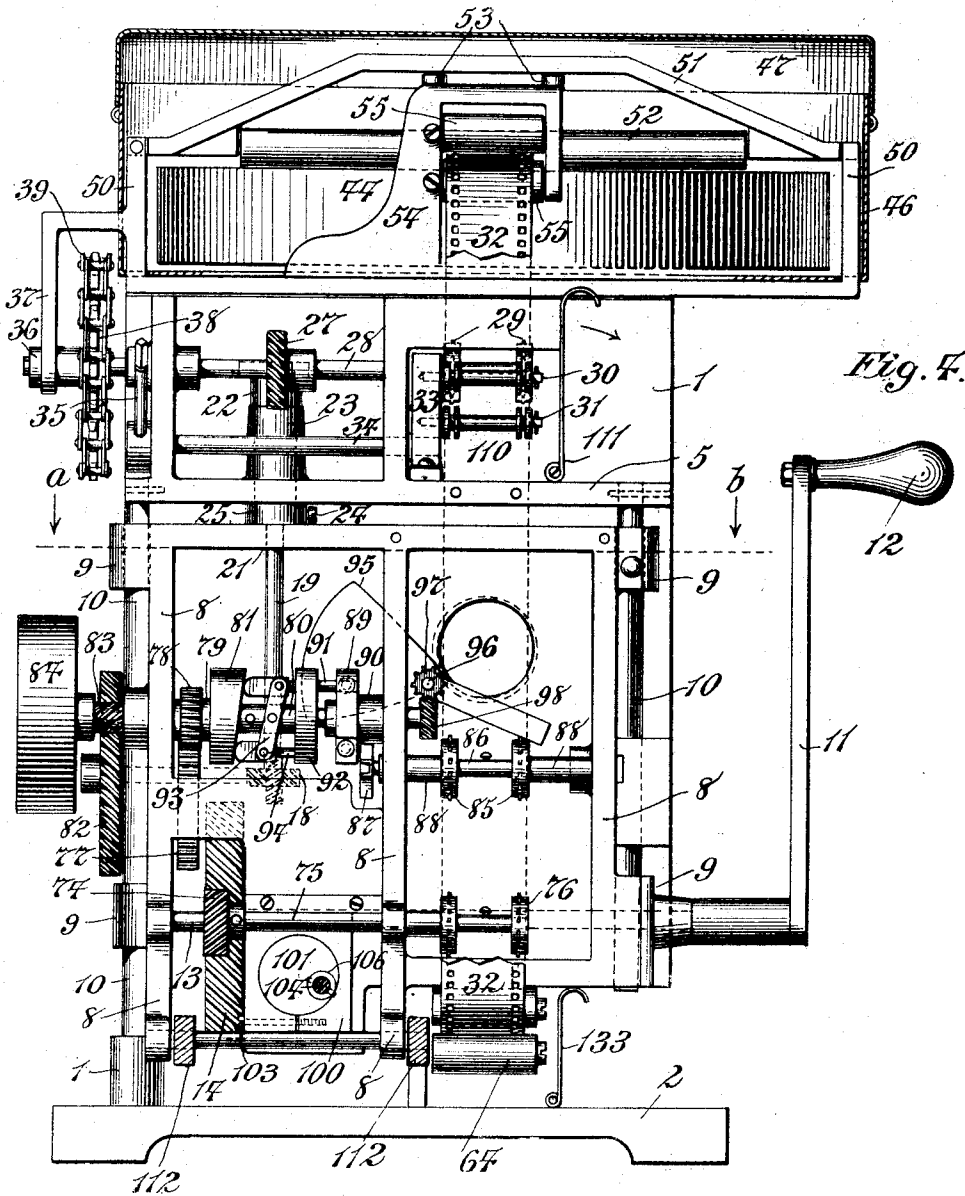


Fig. 4.

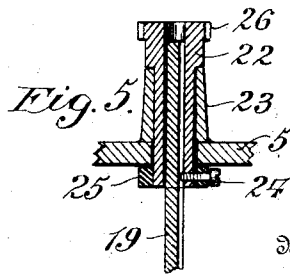


Fig. 5.

Witnesses:
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Charles R. Uebelmesser
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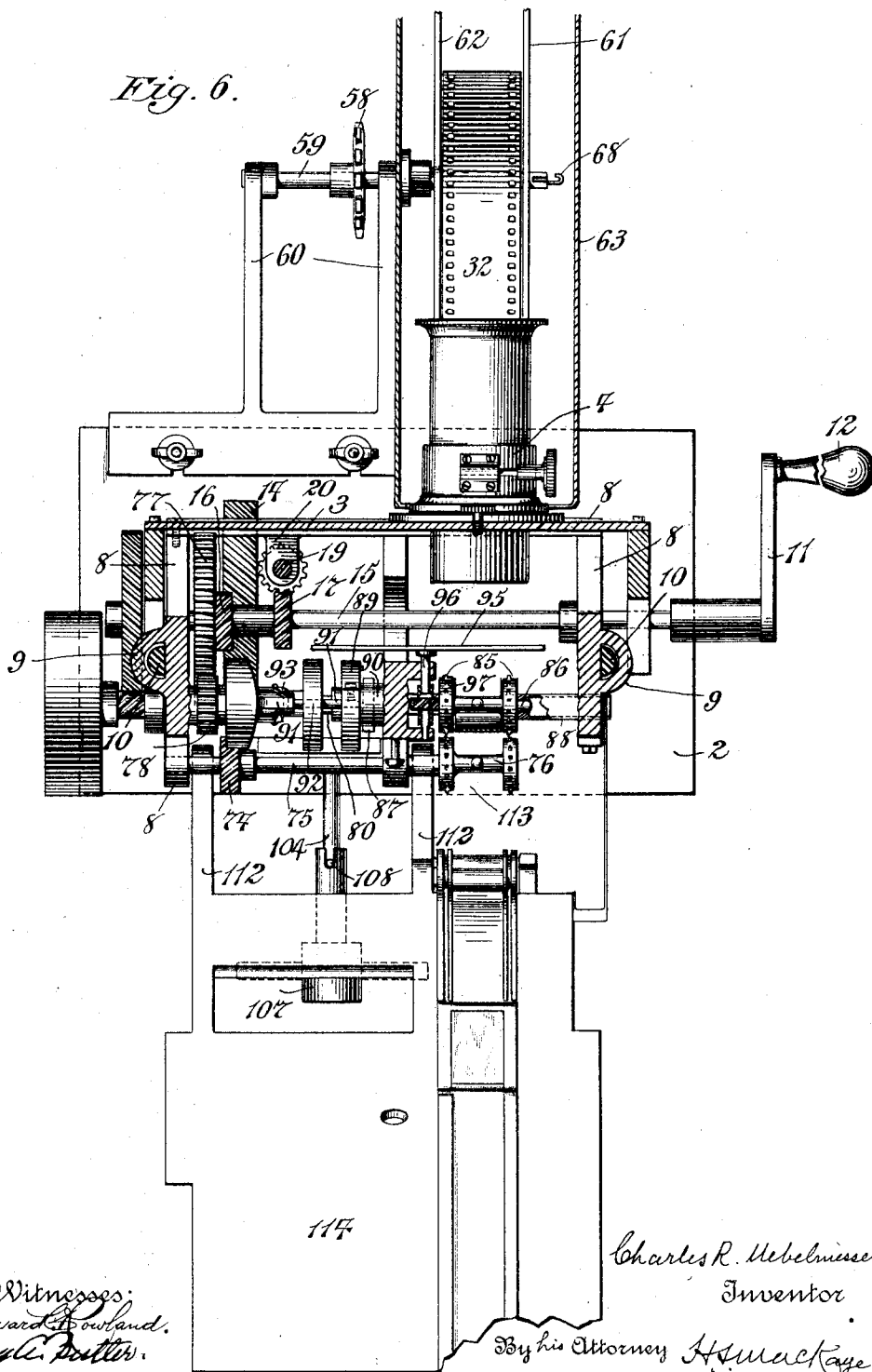
By his Attorney Hamack & Gay

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APPLICATION FILED APR. 28, 1908.

1,023,053.

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8 SHEETS—SHEET 5.

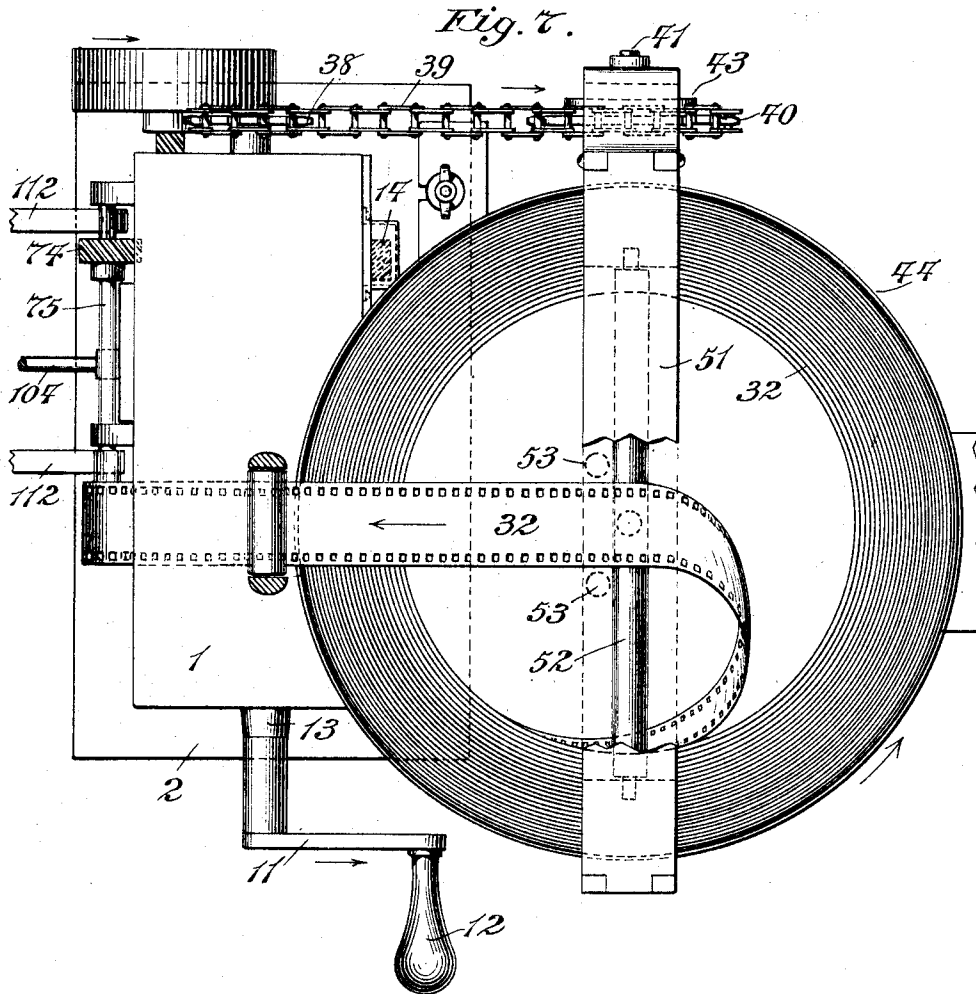


C. R. UEBELMESSER.
MOVING PICTURE MACHINE.
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1,023,053.

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8 SHEETS—SHEET 6.



Witnesses:
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1,023,053.

Patented Apr. 9, 1912.

8 SHEETS—SHEET 7.

Fig. 8.

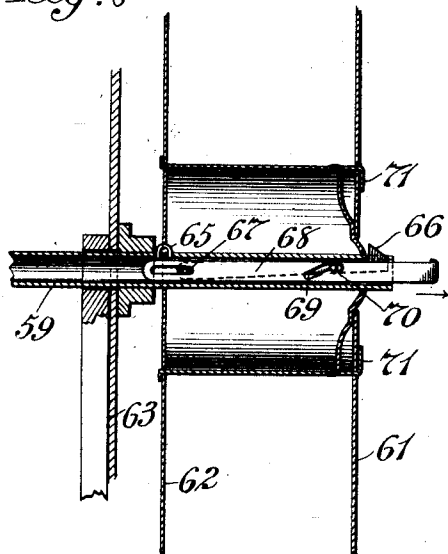


Fig. 9.

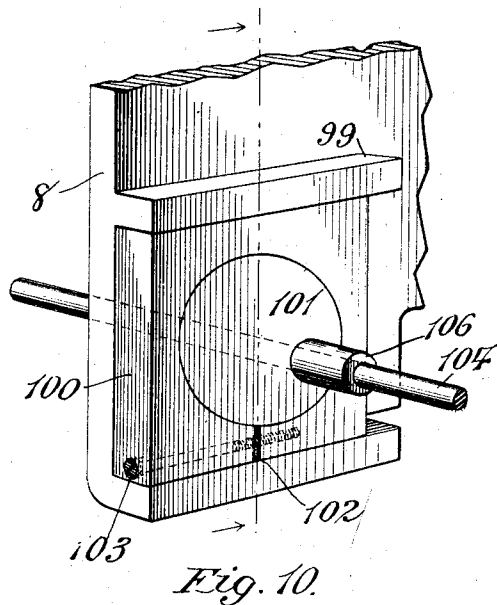
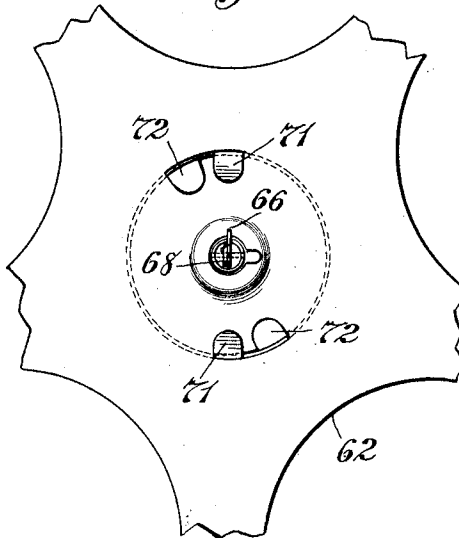


Fig. 10.

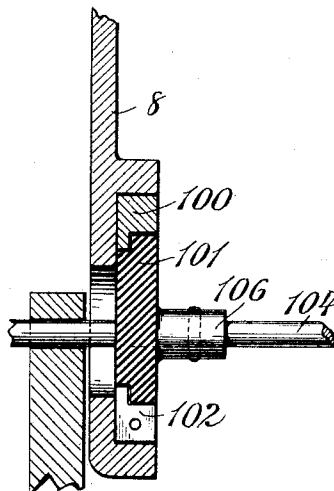


Fig. 11.

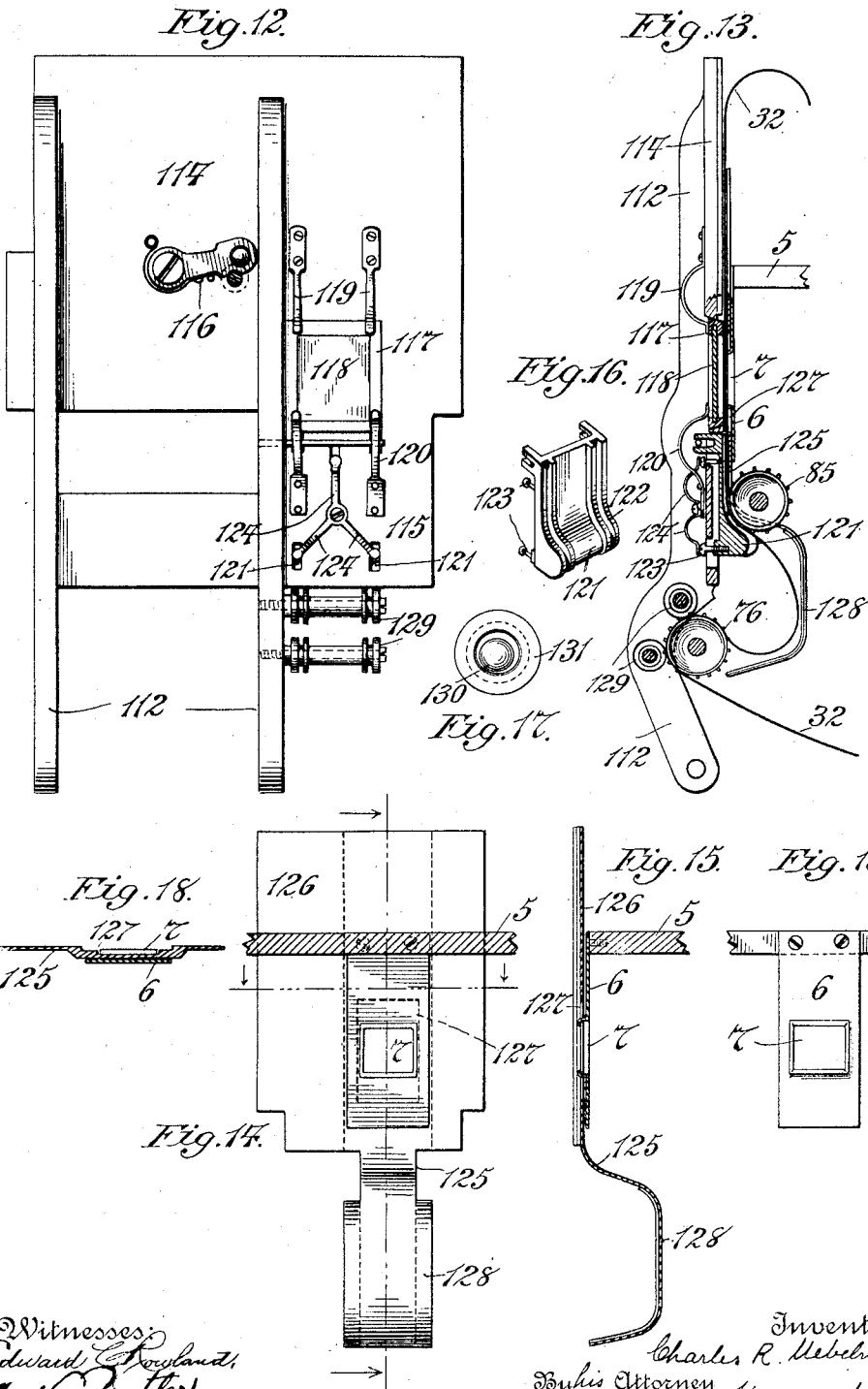
Witnesses:
Edward Rowland.
May 11, 1912.

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1,023,053.

Patented Apr. 9, 1912.

8 SHEETS—SHEET 8.



Witnesses:
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May A. Butler.

Inventor
Charles R. Uebelmesser
By his Attorney [illegible]

UNITED STATES PATENT OFFICE.

CHARLES R. UEBELMESSER, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN MOVING PICTURE MACHINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MOVING-PICTURE MACHINE.

1,023,053.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed April 28, 1908. Serial No. 429,790.

To all whom it may concern:

Be it known that I, CHARLES R. UEBELMESSER, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented a certain new and useful Improvement in Moving-Picture Machines, of which the following is a specification.

My present invention relates to improvements in that class of machines whereby suitable pictures are thrown upon a screen in rapid succession so as to create the illusion of movement.

Among the objects of the present invention is the provision of novel devices for the following purposes, viz.—to facilitate rapid and easy manipulation of the picture-bearing ribbon; to prevent all danger of the ribbon catching fire; to secure a maximum rapidity of movement during picture substitution without corresponding increase in progressive speed of the ribbon; to easily and accurately adjust the centering of the pictures with regard to the lens; to promote accessibility of the ribbon and its driving gears at all times; and to provide a number of detailed improvements hereinafter described and set forth in the claims hereto appended.

A preferred form of the invention is shown in the accompanying drawings, wherein—

Figure 1 is a front view of my moving picture machine; Fig. 2 is a side elevation looking from the left in Fig. 1, the reel boxes being in section; Fig. 3 is a side elevation as seen from the right in Fig. 1; Fig. 4 is a rear view with the tilting back removed; Fig. 5 is a sectional view of a detail; Fig. 6 is a horizontal section on *a—b* in Fig. 4, the tilting back being swung away from the body of the machine; Fig. 7 is a top plan view; Figs. 8 and 9 are a sectional view and elevation of certain details in the ribbon supports; Figs. 10 and 11 are a perspective and section of a portion of the vertical adjusting mechanism; Figs. 12 and 13 are a back view and vertical section of the tilting back; Figs. 14 and 15 are a front view and vertical section of the guard plate, and Figs. 16, 17, 18 and 19 are details.

The various parts of my preferred con-

struction as shown in the drawings are supported upon two frames, one of which is arranged to slide upon the other; this latter, or main frame, being stationary. The main frame, shown at 1, stands directly upon the platform or other stationary support 2, and bears in front the stationary face plate 3, carrying the lensholder 4. A platform 5 forms part of the main frame 1 and there is fixed to it the stationary diaphragm 6, having an aperture 7, whose center is in the line of collimation of the lens in the carrier 4. It is past this opening 7 that the pictures are successively carried.

The secondary or sliding frame is shown at 8 and is provided with ears or lugs 9 through which pass the vertical guides 10, forming part of the main or stationary frame. The driving mechanism and all the other moving parts of my device, excepting the reels, their intermediate and driving gears and the constantly moving feed sprocket, are carried upon the sliding frame 8, as about to be described.

It is obvious that any suitable source of power may be applied to drive this machine, and, in the form illustrated, I have shown a crank 11 turned by a handle 12 and driving a main shaft 13, said crank being intended to be turned in the direction of the arrows in Fig. 2. The main shaft 13 extends across the sliding frame 8, having its bearings on the opposite sides thereof and carrying the main driving gear, 14, preferably made with inclined teeth.

A countershaft 15, parallel to 13 and above it, carries a pinion 16 which is driven by the main gear 14. Upon this countershaft there is also carried an inclined toothed pinion 17, which virtually forms a continuation of the pinion 16 and serves to drive the horizontally rotating pinion 18 on the vertical shaft 19. A bracket 20 on the sliding frame affords one bearing for the shaft 19 whose upper end passes through a bearing 21 on top of the frame 8 and then into a rotary sleeve 22 having a bearing in the post 23 on the platform 5 (see Figs. 4 and 5). The top of the shaft 19 has a longitudinal groove, as shown in Fig. 5, into which projects the screw pin 24. This pin also serves to secure the collar 25 to the

sleeve. The sleeve 22 carries a pinion 26. Thus it will be seen that, when the frame 8 is moved vertically, the shaft 19 moves with it and slides within the sleeve 22, but that, in all positions of the shaft, the sleeve 22 and pinion 26 will turn with said shaft.

The pinion 26 drives the pinion 27 which is fast upon the countershaft 28, and the stationary sprocket wheels 29 for continuous feed of the picture tape are fast upon this countershaft. These cooperate in a well known manner with pairs of grooved wheels 30, 31, in receiving and passing on the perforated picture tape 32 as it moves toward the exposure opening. The wheels 30, 31 are rotatably mounted upon a stud 33, fast on a shaft 34, which can be rotated by the handle bar 35, so as to bring the stud and wheels into the position shown in dotted lines in Fig. 2, when it is desired to adjust the ribbon 32 with respect to the sprocket wheels 29.

The outer extremity of the shaft 28 is supported in a bearing 36 on a bracket 37 projecting from the main frame 1, and it carries a sprocket wheel 38 over which passes a sprocket chain 39 driving a second sprocket wheel 40 which is loose upon the common driving shaft 41 of the two ribbon carriers. A spring 42 presses the sprocket wheel 40 against a disk 43 which is fast upon the shaft 41, and thus movement of the wheel 40 is transmitted to the shaft 41 by friction, whereby is permitted a certain amount of lost motion between the constantly moving ribbon sprockets 30, 31 on one hand and the shaft 41, and therefore the ribbon carriers, on the other hand.

The roll from the interior convolutions of which the picture ribbon is drawn is contained in a rotary circular casing 44, mounted upon a shaft 45 so as to turn within a fireproof box 46 secured to the top of the main frame 1, and provided with a cover 47. The shaft 45 carries a bevel gear 48 which is driven by a similar gear 49 upon the shaft 41. The carrier 44 turns between the up-turned arms 50 of a cross frame attached to the main frame 1. This cross frame supports a guide bar 51, hinged to one of the arms 50 and supported at its opposite end upon the other arm. This guide bar carries a horizontal guide roller 52 and two vertical guide rollers 53, so arranged that the ribbon 32 passes over the roller 52 and is kept in the middle thereof by rollers 53, so as to prevent buckling back as it is drawn from the roll. A bracket 54 extends upward from the top of the main frame 1, through the bottom of the box 46 and carries two supplemental guide rollers 55; between which the ribbon 32 passes on its way down through the machine.

In order that both roll carriers shall

always move in unison, I provide a positive transmission gearing between them which preferably takes the form shown in the drawings. Here, the shaft 41 is provided with a sprocket wheel 56 which drives a chain 57 passing over the sprocket wheel 58 on the countershaft 59. This countershaft turns in fixed brackets 60 and turns the reel whose flanges are shown at 61 and 62, and on which the ribbon 32 is wound after passing through the machine. This receiving reel is preferably protected by a fire proof casing 63, attached to the main frame, said casing being provided with a narrow opening 64 through which the ribbon 32 is carried in to the reel.

In order that the roll of ribbon 32 may be readily removed from the receiving reel, it is desirable that one of the flanges of said reel should be easily removable and that the reel should be removable from the shaft, and for these purposes I have devised the construction shown in Figs. 8 and 9. Here the end of the shaft 59 is made hollow, and upon it the reel may be slipped as a whole, so that the projection or catch 65, which is fast on the shaft, engages with the reel, so that it shall turn with the shaft. In this position the reel is held by the hook 66, whose shank is pivoted at 67 within the hollow shaft 59. Alongside of the hook 66, within the shaft 59, there lies the operating plate 68, having one slot passing over the pivot 67, and a second slot 69, into which projects a pin 70 on the hook 66. The latter slot is so shaped as to raise the hook into the position shown in Fig. 8, when the operating plate is pushed inward; and, when this plate is pulled outward, to depress the hook 66 and thus permit the reel to be drawn off of the shaft 59.

The flange 61 is preferably taken off and put onto the reel as follows. The reel is provided with two (or more) recurved lips 71, and the flange 62 has corresponding openings 72 which can be slipped over these lips as shown in Figs. 8 and 9, after which the flange is rotated so as to cause the bases of the lips to slide into the narrow curved slots 73 extending from each opening 72. In this position the flange is firmly held in place, but can readily be removed by a slight circular movement. Returning now to the main driving gear 14, it will be seen in Fig. 4 that this gear also drives the pinion 74 which turns the shaft 75, upon which are mounted the constantly rotating ribbon-engaging sprocket-wheels 76. These elements are mounted upon the sliding secondary frame 8.

The intermittent movement of the ribbon is produced as follows: The shaft 15, driven as heretofore described, carries a gear wheel 77 which drives the pinion 78 on

the sleeve 79, which surrounds the shaft 80, and to which sleeve is attached the inclined faced cam 81. On the extremity of the shaft 15 is another gear wheel 82 which drives a pinion 83 which is fast on the shaft 80. I prefer to place a flywheel upon the shaft 80 as shown in Fig. 4 at 84. The gears 77 and 82 with their coöperating pinions are so proportioned as to carry out the functions hereinafter described with relation to action of the cam 81. The sprocket wheels 85, which act directly upon the ribbon 32 for producing intermittent movement thereof, are mounted upon a shaft 86 driven by a star wheel 87 which forms the driven member of a novel form of Geneva movement which forms the subject matter of my application for patent filed March 24th, 1908, Serial No. 422906. As most clearly shown in Fig. 6, this shaft 86 is mounted and turns in rotatable eccentric bearings, 88, whereby the position of the wheels 85 and star wheel 87 can be accurately adjusted to compensate for wear in the star wheel.

The novel driving member of the Geneva gear preferably employed in my device and claimed in my aforesaid application for patent, comprises the usual pin carrying disk 89 with the cylindrical extension 90, which are mounted so as to slide along the shaft 80 when impelled by the pin 91. This latter pin passes through a guide disk 92, fast on the shaft 80, and the rear extension of said pin bears, as shown, against the inclined face of the rotary cam 81. The operating pin 91 is connected pivotally, by means of levers 93, pivoted to the shaft 80, to a second pin 94, which also bears upon the cam 81, but 180 degrees away from the pin 91. (See Figs. 4 and 6.) It will be seen that this construction insures the pin bearing disk 89 (which directly drives the star wheel) turning always with the shaft 80; but, as the cam 81, turning with a different speed, acts to draw the disk 89 alternately from and toward the star wheel, this latter will only be intermittently driven. I prefer to so calculate the relative speeds of the shaft 80 and cam 81, that the driving disk 89 only acts every second revolution to impel the star wheel, although it is within the scope of my invention to make engagement and operation less frequent. By this means I am able to double the speed of the driving shaft 80, so as to double the speed of movement of the pictures during substitution, while making no change in the number of pictures per second exposed. I have been able to get rid of all appreciable "flickering" by adapting this construction and to obtain excellent results without using a shutter.

It is to be understood that my machine

may or may not comprise a rotating shutter, but where a shutter is used, I prefer to arrange the same as shown in Figs. 4 and 6, wherein the shutter is shown at 95, mounted upon a short stud 96 whose pinion 97 (preferably having inclined teeth) is driven by the pinion 98 upon the end of the shaft 80. The main driving mechanism and the intermittent ribbon-driving gears are all mounted upon the sliding frame 8, intended to be moved up and down so as to accurately adjust the pictures in proper position with respect to the opening 7 in the fixed plate 6. (See Figs. 13 to 19.) The means preferably employed for producing this up and down movement of the frame 8 are shown in Figs. 3, 4, 6, 10 and 11. The frame 8 carries horizontal guides 99, between which slides the lifting plate 100, which is chambered out to receive the disk 101. The plate 10 is preferably split, as at 102, and the screw 103 is used to determine the pressure of said plate upon the periphery of the disk 101.

A revoluble shaft 104 traverses the disk 101, being made fast to said disk and having bearings shown in Figs. 1 and 3. This shaft has a collar at 105 which prevents its withdrawal from the frame work, and a second collar at 106, whereby the disk 101 is held in place. As best shown in Fig. 6, a removable key or handle 107 can be slipped over the end of the shaft 104, engaging with the cross pin 108 to revolve said shaft. It is obvious that, by turning the shaft 104 one way or the other, the eccentric disk 101 is made to raise or lower the whole frame 8. This arrangement is self-supporting in all positions.

An important feature of my invention is the construction whereby the picture ribbon is supported and guided in a manner to protect it from all danger of conflagration due to the heat from the source of light. The means preferably employed for this end are best shown in Figs. 12 to 19 taken in connection with Figs. 2, 3 and 4. As the ribbon 32 leaves the carrier box 46 it passes between the metal rolls 109 (see Fig. 2) which are placed so close together that, even if any flame were to spread so far, they would prevent its passage. These rolls are placed very close to the top of a fire-proof chamber 110, and substantially fill the opening from said chamber into the box 46. The chamber 110 is formed in the stationary frame 1 and is closed at one side by the pivoted metal door 111, shown in Fig. 4. This door can be tilted down as indicated by the arrow, to expose the sprockets 29 and the ribbon when necessary.

The front of the chamber 110 is formed by the tilting back of the machine, shown in Figs. 12 and 13. The tilting back comprises two ribs 112, pivoted at 113, to the

lower part of the sliding frame 8, (see Figs. 2, 3 and 4) and to these ribs is fixed a flat plate 114, one side of which is vertically extended as at 115, to cover the entire course of the ribbon 32 from and including the upper slack portion within the chamber 110, down past the opening 7, to the sprocket 76. When access to the ribbon and its motive elements is desired the tilting back is thrown open as shown in plan view in Fig. 6, but when the machine is in operation, the back is raised into the position shown in Figs. 2, 3 and 13, where it is held, for instance, by a swinging catch 116. (See Fig. 12.) Opposite the light opening 7, the plate 114 is pierced to accommodate a frame 117 which carries a glass plate 118 and is held in position preferably by springs, for instance such as shown at 119 and 120. Just below this, the tilting back is further provided with a guiding ribbon-adjuster 121, which is placed, as shown, in front of the plate 114, and fits against the ribbon and sprockets 85, said device being provided with grooves 122 in which the teeth of the sprocket may move. Pins 123, on the back of the ribbon adjuster, pass out through apertures in the plate 114, and upon these bear the springs 124, whereby the yielding action is secured. The function of the ribbon adjuster 121 is to maintain the ribbon always in close engagement with the sprockets 85, and by its yielding nature it accommodates differences in thickness and other irregularities in the moving ribbon.

When in operation the ribbon 32 moves down between the portion 115 of the tilting back plate 114 and what may be termed a "guard plate" 125, shown best in Figs. 13, 14, 15 and 18. The guard plate 125 is carried by the sliding frame and has a straight portion 126 which lies flat against the fixed plate 6 on the platform 5. The beading on the edges of the opening 7 in said plate 6 extends backward through an opening 127 in the guard plate, as shown in Figs. 13, 14, 15 and 18. The opening 127 fits the vertical sides of the beading, but is elongated above and below it, so that, as the frame 8 moves up and down, the plate 125 slides upon this beading as a guide. At a point opposite the shaft of the sprockets 85, the guard plate narrows sufficiently to pass between said sprockets and is bent forward to a bow shape as at 128, whereby a chamber is formed to accommodate the slack in the ribbon 32 which forms between the sprockets 85 and 76. The guard plate thus serves at its upper portion to form a channel for the picture ribbon with the tilting back, and, at its lower portion, it protects the slack portion of the ribbon and prevents it from buckling or becoming soiled. The ribbon is held against the sprockets 76 by appropri-

ately grooved rollers 129 mounted on one of the ribs 112 of the tilting back, so that, when this latter is tipped backward, the ribbon may be freed from the sprocket wheels. In Fig. 17 is shown a preferred form of bearing for these rollers. Each roller has an axle shown at 130, and has its bearing in an eccentrically mounted revoluble thimble 131, so that, by turning the thimble, the rollers may be adjusted with respect to their distance from the sprockets 76. This is very useful to compensate for wear. On leaving the sprockets 76, the ribbon passes through a second fire proof chamber to the rollers 64, which latter substantially fill the opening to the reel box 63 and are so close together as to prevent all passage of flame through them. The second fire proof chamber is inclosed between the curved plate 132 at the bottom and the pivoted door 133 at the side. (See Figs. 2 and 4.)

By the use of the construction above described, the expensive picture bearing ribbon is effectually protected from fire. Opposite the light opening and for some distance above and below it, the ribbon moves through a channel so narrow as to practically exclude access of air, whereby combustion is prevented; and moreover, the contact of metal surfaces on both sides of the ribbon carries away the heat so rapidly as to keep the ribbon reasonably cool. If by any accident fire should reach the ribbon, it would be arrested in one or the other of the fire proof chambers and could not spread into either of the coil boxes 46 or 63.

It will be obvious to those skilled in this art that certain features of this machine may be used as well in cameras for taking pictures for kinetoscopes and the like as in moving picture machines themselves, and such features would also answer in machines for printing positives from negatives in a well known manner. My claims are not to be confined, therefore, to moving picture machines.

A variety of forms may be given to the various parts of my improved mechanism, without departing from my invention, and I do not limit myself to the details herein shown and described.

What I claim is—

1. A device of the class described comprising a ribbon roll carrier arranged to permit withdrawal of ribbon from the interior of the roll, a cross frame hinged to the carrier and extending across the ribbon roll, a horizontal ribbon guide on said frame, two edge guides depending from said frame, and means for drawing the ribbon out of the carrier over and between said guides, substantially as described.

2. A device of the class described comprising a fixed main framework having a fire

proof chamber, a roll-inclosing box mounted upon said frame and communicating with said chamber by an opening and metal rollers set close together and substantially filling said opening, substantially as described.

3. A device of the class described comprising a main frame having a fire proof chamber at each of its two extremities, a separate roll-inclosing box attached at each extremity of the frame and communicating with said chambers respectively by narrow openings and metal rollers set close together and substantially filling each opening, substantially as described.

4. A device of the class described comprising a frame having a fire proof chamber at one end, a roll-inclosing box mounted on said frame and communicating with said chamber through a narrow opening and a pivoted door inclosing said chamber on one side, substantially as described.

5. A device of the class described comprising a ribbon moving sprocket-wheel, a pair of grooved rollers adapted to hold a picture ribbon in engagement therewith, eccentrically mounted bearings for said rollers, and means for turning said bearings whereby said rollers may be adjusted with respect to said sprocket wheel.

6. A device of the class described comprising a fixed frame, a sliding frame mounted thereon, means on said sliding frame for supporting and moving a picture ribbon and a tilting back pivoted to and carried by said sliding frame, substantially as described.

7. A device of the class described comprising a fixed plate having a light opening, a tilting back having an opening behind said light opening, a removable window fitting said second opening, and means for moving a picture ribbon between the two openings.

8. A device of the class described comprising a fixed plate having a light opening, a second plate having an opening behind said light opening, a spring-pressed window fitting said second opening, and means for moving a picture ribbon between the two openings, substantially as described.

9. A device of the class described comprising a fixed plate having a light opening, a tilting back having an opening behind said light opening, a removable window fitting said second opening, a perforated guard plate between said tilting back and fixed plate, and means for moving a picture ribbon between said tilting back and said guard plate, substantially as described.

10. A device of the class described comprising a framework, ribbon-moving apparatus mounted thereon and a tilting back, for protecting the ribbon, pivoted to said framework, substantially as described.

11. A device of the class described comprising a framework, a plurality of ribbon-

moving sprockets thereon, a tilting back pivoted to the lower portion of said framework and arranged to cover and protect the ribbon, and ribbon-confining rollers rotatably mounted on said tilting back and having grooves adapted to fit over the teeth in said sprockets when the tilting back is raised, and to be moved away from all of said sprockets when the back is lowered.

12. A device of the class described comprising a framework, intermittently moving sprockets and constantly moving sprockets thereon, a tilting back pivoted to said framework, a yielding member carried by said tilting back and adapted to fit the curve of said intermittent sprockets and rollers rotatably mounted on said tilting back and adapted to hold the ribbon against said constantly moving sprockets, substantially as described.

13. A device of the class described comprising a fixed framework and a secondary framework adapted to slide thereon; in combination with a split lifting plate movably mounted upon the secondary frame, a disk fitting in said lifting plate, means for compressing the lifting plate around said disk, and a shaft fixed eccentrically on said disk and revolubly mounted upon said fixed framework, substantially as described.

14. A device of the class described comprising a fixed framework and a secondary framework having horizontal ribs and an opening between said ribs; in combination with a lifting plate mounted so as to slide between the ribs on said secondary framework, a disk carried by and fitting said lifting plate, and a shaft passing through said disk eccentrically and also through said opening in the secondary framework, said shaft being made fast to said disk and being revolubly mounted upon said fixed framework, substantially as described.

15. A revoluble picture ribbon holder comprising a hollow shaft, a removable reel thereon, a hook engaging with said reel to hold it in place and having a shank pivoted within the hollow shaft, and an operating plate adapted to slide within said shaft and having a mechanical engagement with the shank of said hook for moving the same, substantially as described.

16. A revoluble picture ribbon holder, comprising a hollow shaft, a removable reel thereon, a hook engaging with said reel to hold it in place and having a shank pivoted within the hollow shaft, said shank carrying a pin on its side, and an operating plate beside said hook within the hollow shaft, said plate having an inclined slot engaging with said pin, substantially as described.

17. A device of the class described comprising two revoluble roll carriers, guides for facilitating removal of ribbon from the

interior convolutions of a roll in one carrier, a positive gearing for insuring simultaneous movement of the two roll carriers, motive means for drawing ribbon from the
5 interior convolutions of a roll in one carrier and delivering it to the other carrier and power-transmitting means between said mo-

tive means and said roll carriers for driving the latter while permitting lost motion, substantially as described.

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Witnesses:

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