J. DARBY.

FILM GATE AND TENSION MEANS FOR MOTION PICTURE MACHINES.

APPLICATION FILED DEC. 11, 1918.

1,350,548.

Patented Aug. 24, 1920.

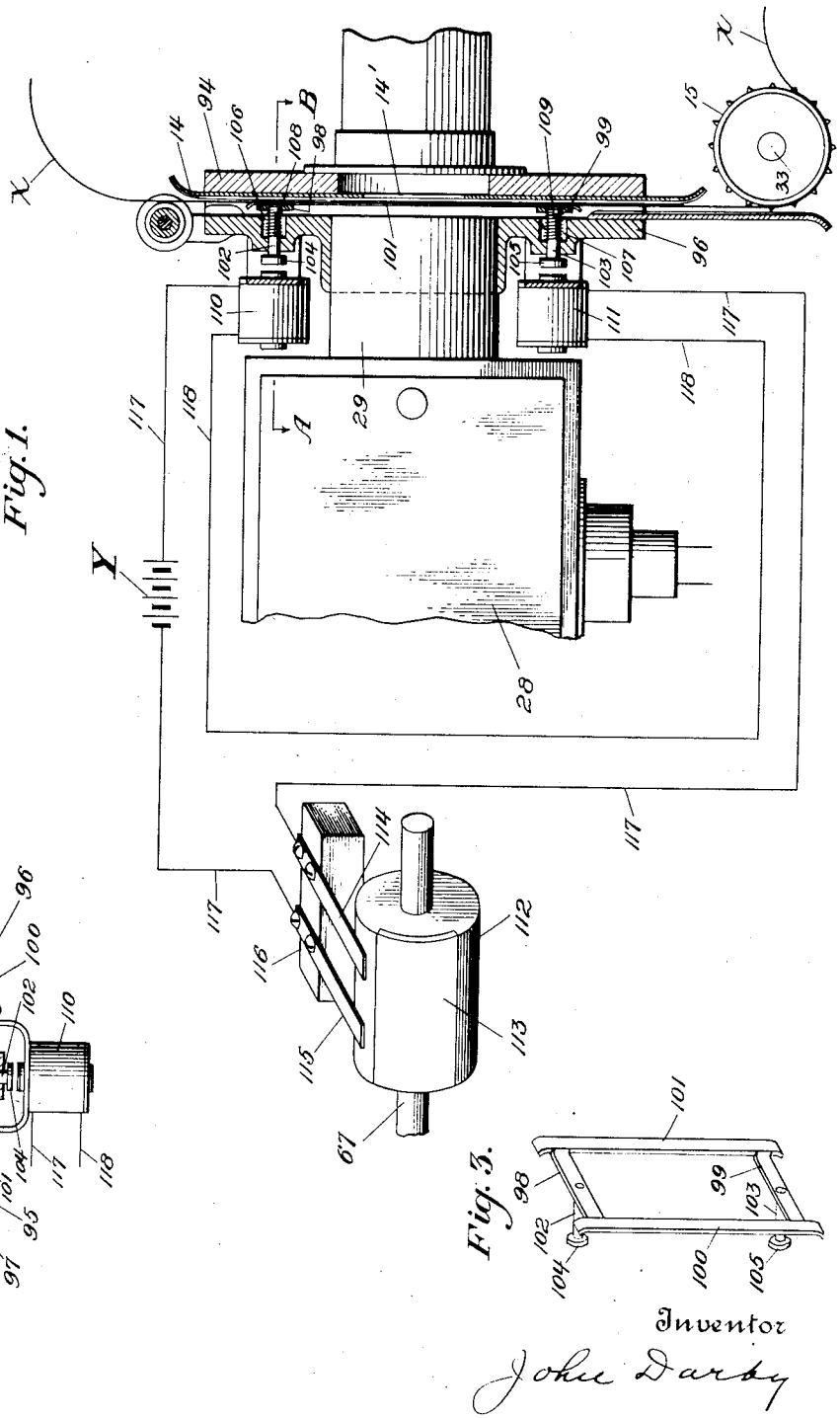


Fig. 1.

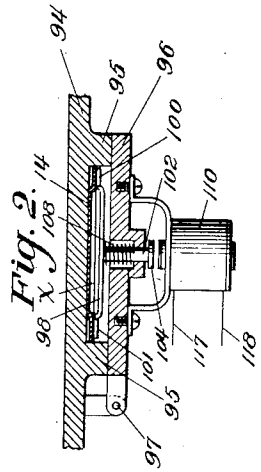


Fig. 2.

Fig. 3.

Inventor

John Darby

UNITED STATES PATENT OFFICE.

JOHN DARBY, OF SUMMIT, NEW JERSEY, ASSIGNOR OF ONE-HALF TO EDWIN F. FLINDELL, OF SUMMIT, NEW JERSEY.

FILM-GATE AND TENSION MEANS FOR MOTION-PICTURE MACHINES.

1,350,548. Specification of Letters Patent. Patented Aug. 24, 1920.

Original application filed March 1, 1918, Serial No. 219,752. Divided and this application filed December 11, 1918. Serial No. 266,250.

To all whom it may concern:

Be it known that I, JOHN DARBY, a citizen of the United States, residing at Summit, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Film-Gates and Tension Means for Motion-Picture Machines, of which the following is a specification.

The invention relates to film gate mechanism for motion picture machines, and more especially to the means for maintaining the film flat against the aperture plate during the projection of a picture and to release the tension on the film strip during its movement to bring the next succeeding picture into frame with the aperture.

The objects of the invention are to provide means for intermittently applying and relieving tension to the film strip which will be instantaneous and noiseless in action and which will eliminate the wear of moving parts.

These and other objects and advantages will be set forth in part hereinafter and in part will be obvious herefrom, such objects and advantages being obtained by the instrumentalities pointed out in the accompanying claims.

The invention consists in the novel parts, construction, arrangements, combinations and improvements herein shown and described.

This case is a division of my copending application, Serial No. 219,752, filed March 1, 1918.

Of the drawings:

Figure 1 is an elevation partly in section, showing the aperture plate and tension means together with other parts and the means for automatically applying and relieving the tension to and from the film strip.

Fig. 2. is a section on line A B of Fig. 1.

Fig. 3. is a detail view of the tension frame.

As embodied in the construction disclosed, a plate or member 94, forming a part of or being attached to the frame of a motion picture machine, is provided with two guiding strips 95, 95 which form a channel for the film strip X and a housing for the aperture plate 14. A gate 96 hinged to member 94 at 97 supports the lamp house 28 and forms a closure for the channel in member 94.

Movably supported in gate 96 is a rectangular frame member, consisting of an upper cross bar 98 and a lower cross bar 99 which support between their ends the vertical members 100 and 101. Said vertical members are so disposed as to bear, when forced inwardly, on the vertical edges of the film strip X and press it against the aperture plate 14.

Pins 102 and 103 secured in cross bars 98 and 99, respectively, pass through apertures in gate 96 and terminate in heads 104 and 105.

Housed in recesses 106 and 107 of gate 96 are compression springs 108 and 109 embracing the pins 102 and 103 and reacting between the inner faces of recesses 106 and 107 and the outer faces of bars 98 and 99, tending normally to press the vertical members 100 and 101 of the tension frame against the film strip X and maintain said strip in contact with the aperture plate.

Supported on gate 96 by suitable brackets are two magnets 110 and 111 so disposed as to have their cores, when energized, attract as armatures the heads 104 and 105 of pins 102 and 103. Means are provided to prevent the armatures and the cores of the magnets from making metal contact, such for example, as by regulating the tension of springs 108 and 109, or by interposing some non-magnetic cushion, such as rubber or cork between said armatures and said magnet cores; thus eliminating all noise in the operation of the tension device.

Means are provided to intermittently move the film strip X to bring the next succeeding picture of said strip in frame with the aperture 14′ of the plate 14 and as shown is comprised of the usual sprocket roller 15 on shaft 33 which may be driven by any suitable mechanism in the well known manner.

Means are provided for exciting the magnets 110 and 111 in time with the movement of film strip X to relieve the tension on said film, and as embodied comprise an insulating cylindrical member 112 mounted on a shaft rotating in proper time relation with the film moving sprocket, such for example as the shaft 67 in my copending application, Serial No. 219,752, filed March 1, 1918.

The cylindrical member 112 carries a conducting piece 113 designed to intermittently form a bridge between the brushes 114 and 115 supported by the insulating block 116.

Suitable connections 117 and 118 are provided between the brushes 114, 115, a source of electrical energy, such for example as the battery Y, and the magnets 110 and 111.

It will be obvious that the reaction of the springs 108 and 109 tend always to create a pressure of the vertical members or shoes 100 and 101 against the film strip X to press it flat and in close contact with the aperture plate 14 while said strip is at rest or during the period of projection; and that the commutator 112 is so timed as to complete the electric circuit through, and energize the magnets 110 and 111 just before the intermittent sprocket 15 moves to draw down the next succeeding picture of the film strip.

The energizing of magnets 110 and 111 causes them to attract the heads 104 and 105 of pins 102 and 103 and to withdraw the tension frame against the action of springs 108 and 109 and relieve the pressure of shoes 100 and 101 from the film strip. The bridging piece 113 of commutator 112 is of such a width as to keep the magnets 110 and 111 energized during the full movement of the film strip and to break the circuit through said magnets and release the tension frame as soon as movement of film strip ceases.

It will be evident from the foregoing, that devices have been provided realizing the objects and advantages herein pointed out, together with other objects and advantages.

It will be further understood, that many changes may be made from the precise form of such devices herein shown and described, within the accompanying claims, without departing from the principles of the invention and without sacrificing its objects and advantages.

I claim:

1. In a motion picture projecting machine, an intermittent tension device for the film strip, consisting of two vertical members connected by two cross members, pins in said cross members and electromagnets to act upon said pins to move said tension device.

2. In a motion picture projecting machine, an intermittent tension device for the film strip, consisting of two vertical members connected by two cross members, pins in said cross members, springs surrounding said pins and acting against said tension device and electromagnets to act upon said pins to move said tension device against the pressure of said springs.

3. In a motion picture projecting machine, an intermittent tension device for the film strip, consisting of two vertical members connected by two cross members, pins in said cross members, tension springs surrounding said pins, a film gate supporting said tension device and housing said pins and said springs and electromagnets to act upon said pins to move said tension device against the tension of said springs.

4. In a motion picture projecting machine, an intermittent tension device for the film strip, consisting of two vertical members connected by two cross members, pins in said cross members, tension springs surrounding said pins, a film gate supporting said tension device and housing said pins and said springs, electromagnets carried by said gate and acting upon said pins to move said tension device against the pressure of said springs and a commutator to energize said magnets.

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

JOHN DARBY.

Witnesses:
CHARLES C. BRESEE,
E. S. ECKARDT.