L. L. HEADLEY.

PICTURE PROJECTING MACHINE.

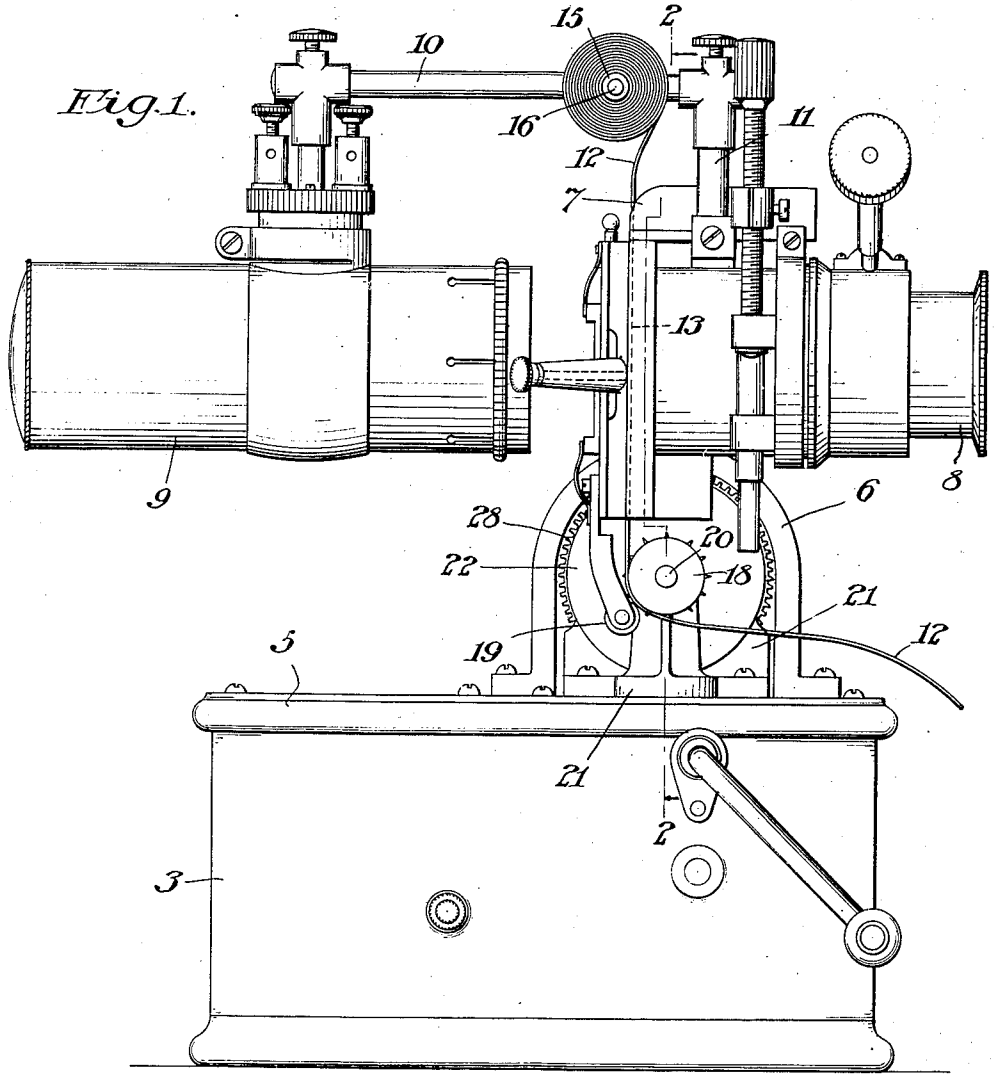
APPLICATION FILED JULY 2, 1915.

1,201,727.

Patented Oct. 17, 1916.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

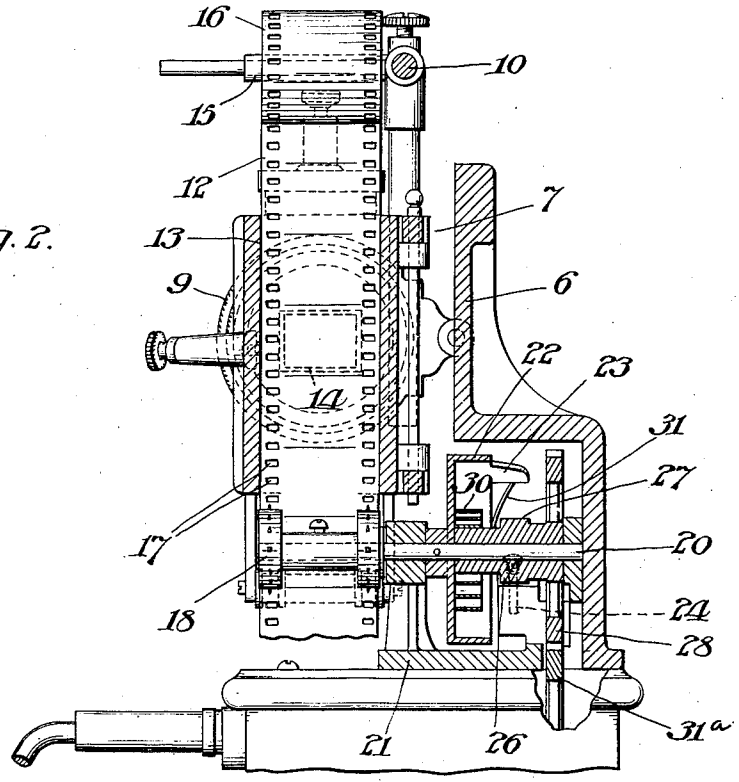


Fig. 3.

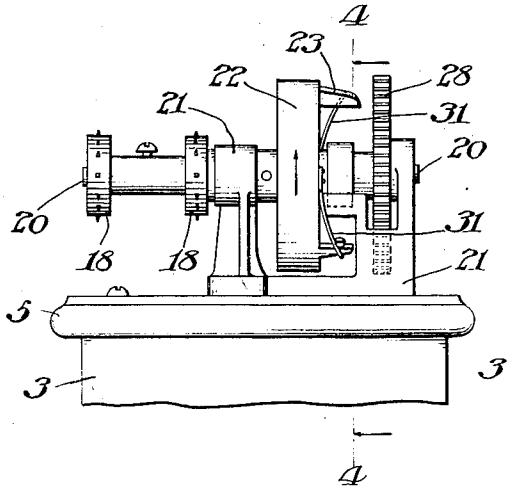
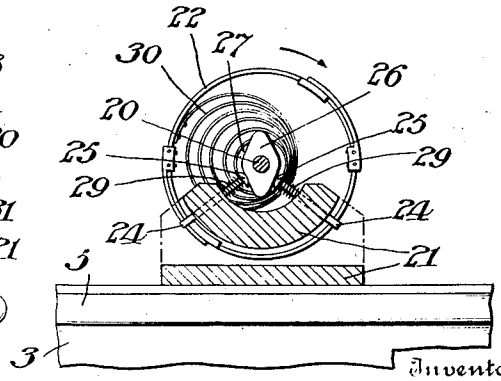


Fig. 4.



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UNITED STATES PATENT OFFICE.

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PICTURE-PROJECTING MACHINE.

1,201,727. Specification of Letters Patent. Patented Oct. 17, 1916.

Application filed July 2, 1915. Serial No. 37,661.

To all whom it may concern:

Be it known that I, LABAN LESLIE HEADLEY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Picture-Projecting Machines, of which the following is a specification.

The object of my invention is to provide a picture projecting machine of novel, simple, and efficient construction by means of which a picture film may be actuated with respect to the projecting devices so that successive and distinctly different pictures may be successively projected upon a screen and permitted to remain on the screen a sufficient length of time to permit each picture to be fully comprehended before the next succeeding picture is projected on the screen, and so that the time consumed in changing the pictures shall be exceedingly short as compared with the time the pictures are permitted to remain upon the screen.

My invented machine is particularly adapted for use in connection with picture films having a series of pictures representing successive aspects of an object or objects in such relation to each other that a story may be readily understood from successive pictures illustrating the same without having the successive aspects of the object or objects in such near relations to each other as to give the effect of a motion picture.

The invention consists in the novel construction and combinations of parts hereinafter fully described and particularly claimed.

In the accompanying drawings illustrating my invention: Figure 1 is an elevation of a picture projecting machine embodying my invention. Fig. 2 is a vertical section through a portion of the machine, on line 2—2 of Fig. 1. Fig. 3 is an end elevation of the upper portion of the motor casing and the film actuating mechanism mounted thereon. Fig. 4 is a vertical section, on line 4—4 of Fig. 3.

Referring to the drawings, the frame of the machine, as generally stated comprises a motor containing base box or casing 3 having a removable top or cover 5 secured thereto, a standard 6 secured to and rising from the top of the casing 3, and a bracket 7 secured to and projecting outwardly from the standard 6. The lens 8 for projecting the pictures is of usual form and is carried by the bracket 7, and the lamp 9 for projecting the pictures is also of usual form and is carried by a horizontal arm 10 which extends from a post 11 rising from the bracket 7, as shown.

The picture film strip 12 extends vertically through a guide slot or passageway 13 in the bracket 7 and between the lens 8 and the lamp 9; and the bracket 7 has an opening 14 therein between the lens 8 and the lamp 9 and corresponding with one of the series of pictures on the film 12 and through which the light may pass from the lamp 9 in projecting the pictures of the film 12 upon a screen. The picture film strip is wound upon a roller 15 which is mounted to turn on a pin 16 which projects from the arm 10, the film strip 12 extending from the roller 15 down through the guide opening 13 in the bracket 7, and one of the pictures of the series on the strip 12 being in registry with the opening 14 when the strip is at rest.

The film strip 12 is provided with the usual marginal sprocket engaging openings 17 and it is adapted to be drawn from the roller 15 and down through the guide opening 13 by a pair of sprocket wheels 18, and between the sprocket wheels 18 and a roller 19 which serves to insure the engagement of the film strip 12 with the sprocket wheels 18. As the film strip leaves the sprocket wheels 18 it may be discharged from the machine or into or upon a suitable receiver to be afterward rewound upon the roller 15 and again passed through the machine. The sprocket wheels 18 are secured on a horizontal shaft 20 which is mounted to turn in a bracket 21 which is secured on the top 5 of the casing 3. The shaft 20 has a hollow wheel 22 secured thereon, and the wheel 22 is provided on its outer portion with two oppositely disposed teeth 23 which project from one side of the wheel and in the direction of the shaft 20. When the wheel 22 is turned, the teeth 23 thereof are adapted to encounter the outer end portions of two stop pins 24 which are slidably mounted in the bracket 21 and are movable radially toward and from the shaft 20 to move the outer end portions of the pins 24 into and from the path of the teeth 23.

The inner ends of the pins 24 are provided

with heads 25 which bear against a cam 26 forming a part of the hub 27 of a gear wheel 28 which is rotatably mounted on the shaft 20. The heads 25 are forced toward and maintained in contact with the cam 26 by springs 29 which encircle the pins 24 between their heads 25 and the part of the bracket 21 in which the pins 24 are mounted to slide. The contour of the cam 26 is such that the pins 24 will be forced outwardly into the path of the teeth 23 and be permitted to be moved inwardly from said path in alternate succession, each pin 24 during its outward movement entering the path of the teeth 23 before the other pin 24 is withdrawn from said path. The hub 27 of the wheel 28 extends into the hollow wheel 22, and surrounding the hub 27 within the wheel 22 is a spiral spring 30 the inner end of which is secured to the hub 27 and the outer end of which is secured to the wheel 22. The spring 30 is arranged relatively to the hub 27 and wheel 22 so that when the wheel 28 is turned in the direction of the arrow, the spring 30 will be wound upon the hub 27, tending at all times to turn the wheel 22 and therewith the shaft 20 and sprocket wheels 18 in the direction of the arrow. When the wheel 22 is at rest one of its teeth 23 is in engagement with one of the stop pins 24. Each time a stop 24 is withdrawn from one of the teeth, the spring 30 quickly turns the wheel 22 until one of the teeth 23 engages the other stop pin 24, and thus the wheel 22 is intermittently rotated during the continuous rotation of the wheel 28. The wheel 22 is provided with spring fingers 31 which engage the stop pins 24 as the teeth 23 come into engagement with the pins 24 thereby cushioning the teeth 23 and reducing the force of the blows struck by the teeth 23 against the pins 24. The teeth 23 and stop pins 24 are arranged relatively to each other so that each time a stop pin 24 releases a tooth 23 the wheel 22 will be turned the same distance and the pictures of the film strip 12 are arranged relatively to each other and to the sprocket wheels 18 so that each time the wheel 22 and therewith the sprocket wheels 18 are turned, the next succeeding picture of the series of pictures on the film strip 12 will be brought into registry with the opening 10 to be projected on the screen. The gear wheel 28 coacts with the driving gear wheel 31[a] of a suitable spring or electric motor contained within the box or casing 3 and provided with means to rotate its driving gear wheel 31 very slowly, thereby rotating the gear wheel 28 very slowly. As the gear wheel 28 and cam 26 are turned very slowly, the time required to withdraw a stop pin 24 from a tooth 23 is much greater than the time required by the spring 30 to move the wheel 22, the power of the spring 30 being regulated to move the wheel 22 practically instantaneously with the withdrawal of each stop pin 24. The entire mechanism is so timed that each picture will remain upon the screen about ten seconds and that the pictures will be practically instantaneously changed. The time that each picture is permitted to remain upon the screen may be regulated by regulating the speed of the motor driving the gear wheel 28.

I claim:

1. In a picture projecting machine, the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, and movable stop pins actuated by the driving shaft and coöperating with the toothed wheel.

2. In a picture projecting machine the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, movable stop pins coöperating with the toothed wheel, and a cam on the driving shaft for actuating the stop pins.

3. In a picture projecting machine, the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, movable stop pins coöperating with the toothed wheel, springs tending to move said pins out of the path of the teeth

of said toothed wheel, and a cam on the driving shaft for moving said pins into the path of the teeth of said toothed wheel.

4. In a picture projecting machine, the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, two movable stop pins co-operating with the toothed wheel, and means controlled by the driving shaft for moving said stop pins into and out of the path of the teeth of said toothed wheel in alternate succession.

5. In a picture projecting machine, the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, two movable stop pins co-operating with the toothed wheel, springs tending to move said pins out of the path of the teeth of said toothed wheel, and a cam on the driving shaft for moving said pins into the path of the teeth of said toothed wheel in alternate succession.

6. In a picture projecting machine, the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, movable stop pins controlled by the driving shaft and adapted to be engaged by the teeth of the toothed wheel to stop the rotation of the first named shaft, and cushioning means adapted to engage said pins in advance of the teeth of said toothed wheel.

7. In a picture projecting machine, the combination of a frame, means to support and guide a picture film having marginal sprocket engaging openings therein, a shaft provided with a sprocket wheel adapted to actuate a picture film guided by said means, a motor actuated driving shaft, a spring connecting said shafts and adapted to be actuated by the driving shaft and to actuate the first named shaft, and automatic means to stop the turning of the first named shaft against the action of said spring and to permit it to be turned by said spring at certain intervals, the last named means comprising a toothed wheel carried by the first named shaft, movable stop pins controlled by the driving shaft and adapted to be engaged by the teeth of the toothed wheel to stop the rotation of the first named shaft, and inclined spring cushioning fingers carried by said toothed wheel adjacent to the teeth thereof and adapted to engage said pins in advance of the engagement of said teeth with said pins.

In testimony whereof I affix my signature in presence of two witnesses.

LABAN LESLIE HEADLEY.

Witnesses:

WM. HARRISON SMITH,

A. V. GROUPE.