

J. BIANCHI.
APPARATUS FOR ANIMATED PICTURES.

(Application filed Oct. 24, 1900.)

(No Model.)

2 Sheets—Sheet 1.

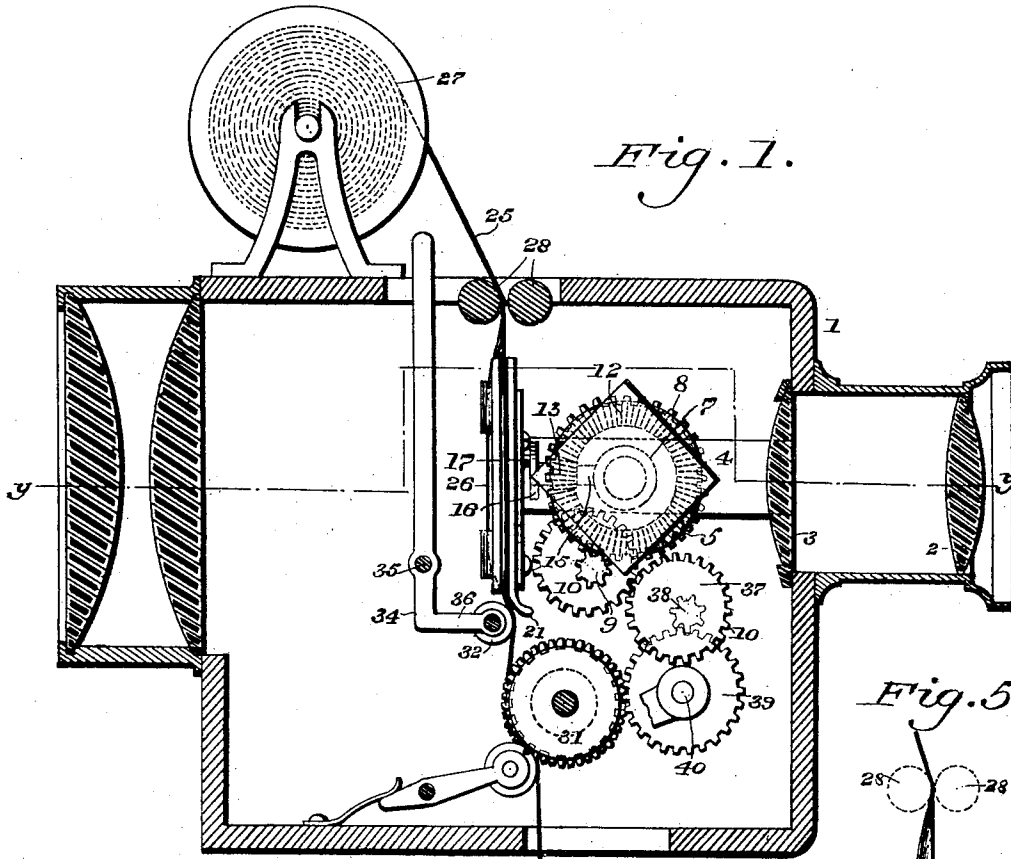


Fig. 1.

Fig. 5.

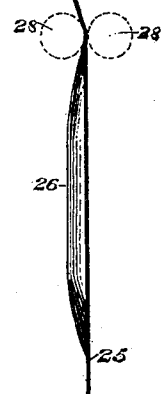


Fig. 6.

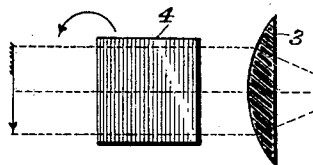
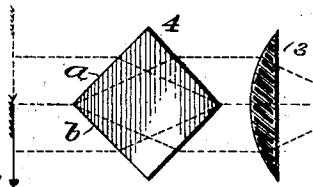


Fig. 7.



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2 Sheets—Sheet 2.

Fig. 2.

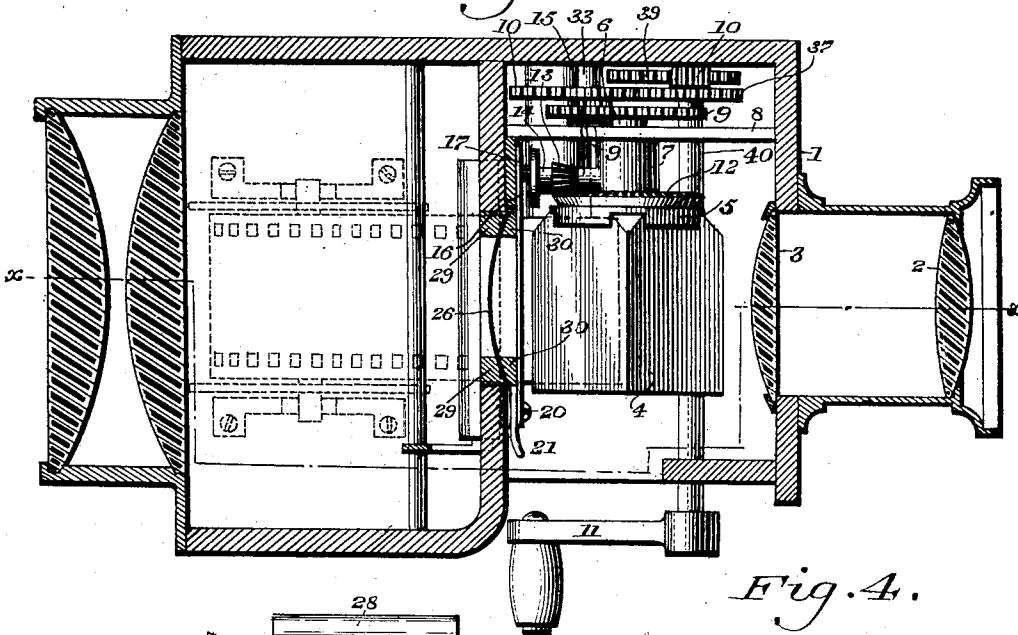


Fig. 4.

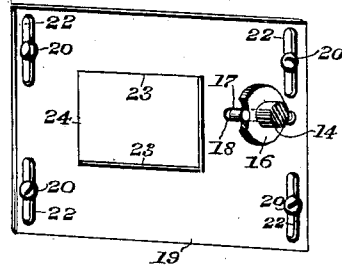
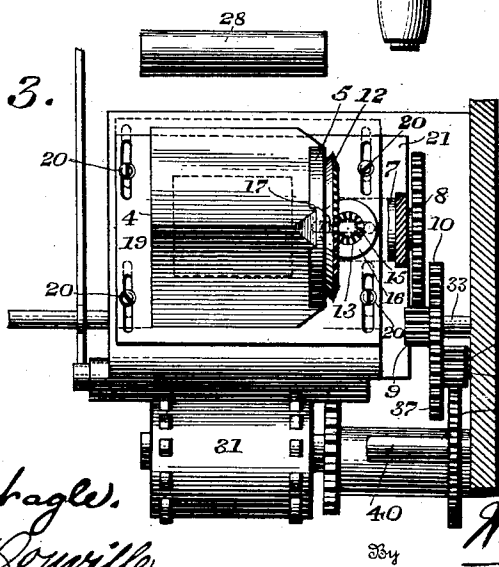


Fig. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR ANIMATED PICTURES.

SPECIFICATION forming part of Letters Patent No. 708,303, dated September 2, 1902.

Application filed October 24, 1900. Serial No. 34,103. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH BIANCHI, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Animated Pictures, of which the following is a specification.

My invention consists of an improved construction for apparatus for animated pictures wherein I provide means for preventing the intermittent or non-continuous appearance which frequently occurs in exhibiting continuous pictures in devices of this character, the present invention consisting more especially in placing in front of the moving film a transparent body or bodies, which may be of any suitable shape or cut so that angles are provided and so that each surface is parallel with another surface, said body being adapted to revolve on an axis which is stationary in the position indicated with respect to the apparatus and means being provided that as the body or bodies revolve a complete picture will always be reflected—that is, the said body presents a flat surface when the complete picture is in the optical center, and when a portion of one picture and a portion of another are in the optical center the surfaces of the body are so arranged as to reflect each portion in such a manner that the reflected picture appears as a complete picture, although it is formed of a portion of one picture and a portion of another.

It further consists of means for adjusting the picture in order to keep a single picture formed in the optical center.

It further consists of employing a means for retarding or accelerating the revolutions of the transparent body.

It also consists of the novel combination of a reciprocating slide or gate.

It also consists of novel construction of devices for imparting a transverse curve to the film at the point where the picture is focused for facilitating the same and obtaining a sharper image on the screen.

It further consists of novel details of construction, all as will be hereinafter fully described, and particularly pointed out in the claims.

Figure 1 represents a longitudinal sectional view of an apparatus for animated pictures embodying my invention, certain of the parts being shown in elevation, the section being taken on line *xx*, Fig. 2. Fig. 2 represents a horizontal sectional view on line *yy*, Fig. 1, certain of the parts being shown in elevation. Fig. 3 represents an end elevation showing the relation of the movable transparent body to its adjuncts. Fig. 4 represents a perspective view of the reciprocating slide or gate adapted to coact with the transparent movable or rotating body and film. Fig. 5 represents a side elevation showing the curved contour the film assumes at the point where it is focused. Figs. 6 and 7 represent diagrammatic views showing the path of the rays of light through the transparent movable body in the different positions the same may assume.

Similar characters of reference indicate corresponding parts in the figures.

1 designates an apparatus for animated pictures, the same being provided with the lenses 2 and 3, in line with which is located the transparent movable or rotatable body 4, the axis thereof being stationary in the position indicated with respect to the apparatus, said transparent body being rotatably mounted and supported in any convenient manner. In the present instance I have shown the same as suitably secured to the plate 5, which is mounted on the shaft 6, which has its bearing in the stationary sleeve 7, which is supported in any suitable manner upon the body of the apparatus and actuated by means of the gear 8, which is in mesh with the pinion 9, which carries with it the eccentric gear 10, which latter meshes with the eccentric gear 37, the same carrying the pinion 38, which meshes with the gear 39, the latter being mounted on the shaft 40, to which is secured a crank or handle 11, whereby power can be applied to said shaft 40, or by any other suitable means, it being noticed that the various gears are carried by suitable shafts—as, for example, the gear 10, mounted on the shaft 33, and the gear 37, mounted on the shaft 41.

12 designates a beveled gear which is carried by the plate 5 and is adapted to mesh with the beveled gear 13, which is carried by the sleeve 14, which revolves on a suitable

shaft or bearing 15, which is in the present instance supported from the sleeve 7, as will be understood from Fig. 2.

16 designates a crank-arm or disk which is attached to the sleeve 14, said arm carrying the pin 17, which engages a slot 18 in the slide 19, wherefrom it will be seen that the rotation of the arm 16 and the pin carried thereby will cause said slide to move up and down in a vertical direction, said slide being guided and supported by the pins 20, which are attached to the front plate of the apparatus 21, said pins passing through slots 22 in said slide, as will be clearly understood from Figs. 3 and 4. The frame 19 is adapted to frame the picture in order that a picture will be properly reflected or projected and is adapted to be moved up and down, which movement is so timed with respect to the movement of the film and solid body that the proper portion of a picture or a portion of the adjacent picture is suitably framed.

23 designates the upper and lower edges of the opening 24 in the slide 19, it being understood that the rotation of the body 4, the operation of the slide 19, and the movement of the film are so arranged that the various parts will coact in order to provide a perfect result.

Referring to Fig. 6, when the whole picture is in the optical center the slide is so arranged as to be also in the true center, and the revolving body portion presents a plain surface to the picture, so that the rays of light pass through the same, as seen in Fig. 6, and the objective lens 3 will reverse the picture and throw the same upon the screen, as shown, it of course being remembered that the picture on the film back of the body is presented upside down. As the film descends revolving body 4 turns in the direction indicated by the arrow and is so timed with respect to the film that, for example, when one-half of one picture and one-half of the next picture are in the optical center, as shown in Fig. 7, an edge or angle of the revolving body is in a line therewith, so that by the reflecting-surfaces the lower half of the upper picture is deflected through the body 4 and through the objective lens 3 and when thrown upon the screen becomes the upper half of the picture on the screen, while the upper half of the lower picture on the film is deflected through the body 4 and through the objective lens 3 and becomes the lower half of the picture reflected on the screen. Thus a perfect picture is formed. The slide is operated to raise and lower in order to frame a picture or portions of adjacent pictures, so that the same are properly reflected or projected, it being seen that when a single picture is in the optical center the slide frames the same, and as the film moves downward and the solid body revolves the said frame moves downward therewith until the transparent body presents an angle in the optical center and is in a position to reflect the bottom portion of the upper picture. The slide

then begins to move upward in order to uncover the bottom portion of the said upper picture in order that the same may be reflected and covers the bottom portion of the lower picture in order that a complete picture may be reflected or projected, and thus upward movement of the slide continues as is necessary or until it meets a complete picture. It then begins to lower until it assumes its former position in the optical center. It is of course understood that the body 4 revolves with relation to the movement of the film, so that when a portion of one picture and a portion of another picture are in the optical center the body 4, with its reflecting-faces—for example, *a*—will reflect any portion of the upper picture which is in the optical center, while the other reflecting-face *b* will reflect any portion of the other picture which is in the optical center, whereby a perfect picture is always presented on the screen, although it is formed by a portion of one picture on the film and a portion of the next. When a single picture is in the optical center, a flat surface of the body is presented, so that the full picture on the film in the optical center appears in a complete reflected image on the screen, or, in other words, the body has no effect upon the picture in the optical center and is the same as if the same body did not exist. By means of the eccentric gears the revolution of the body is arranged so that it revolves slower or faster at the proper time in order to overcome the apparently up-and-down movement of the reflecting image. It will be noted that the sides or faces of the transparent body are of equal proportion to correspond with the size of the picture or pictures on the film, whereby it will be seen that the film and the said body can be rotated continuously with respect to each other and that the picture will be reflected continuously without the usual stoppage or interference, producing an intermittent motion, which now occurs in machines of this character. It will be further noted that owing to the equal length of the faces composing the transparent body the proper portions of adjacent pictures on the film will be reflected or refracted, producing a complete and continuous picture, which would not occur were certain sides of the body of different lengths from other sides, as it would cause each succeeding picture to be refracted (or held) too long or too little a time to properly blend into one another. Thus it will be seen that the faces or working sides of my transparent body being equal in proportions, and thereby producing a continuously-visual picture, the old intermittent motion necessary to other machines of this character is obviated.

In order that the film 25 may be properly focused and produce a sharp image, I cause said film at the period it is in line with the condensers and objective to assume a curved contour in cross-section, as indicated at 26, so that the two edges and center are properly

focused or produce a flat field, the film being caused to pass from the supply-roll 27 between the rollers 28 and thence between the curved ways or guides 29 and 30, as will be understood from Fig. 2, the film being afterward conducted over the sprocket-wheel 31, which is actuated in any suitable manner. The film is adjusted by means of the roller 32, which is carried by the arm 36, the latter forming a part of and being connected with the arm 34, fulcrumed at 35, whereby by proper manipulation of the parts the picture can be adjusted and keep the same properly framed in the optical center. This arm or lever 34 is designed to be operated to center the picture in the optical center. If the picture is too high, the arm or lever is operated to cause its roller 32 to press against the film, and thus draw down the picture to the proper point. Should the picture be too low, the said arm or lever is operated in the other direction, so that the roller 31 will first take up the slack, which causes the film to travel at a slower speed, so that the pictures thereabove will be properly presented and move in time with the transparent body and frame.

It will be understood that my invention is applicable to devices for taking animated pictures, as well as for producing them, and that the invention will be operative whether the pictures are projected or not.

It will of course be understood, as above stated, that the mechanism can be used for taking pictures or as a slot-machine, in which event such slight changes may be made as necessary, such as using a picture-band in place of the film, and other changes may be made without departing from the spirit of my invention, and I desire, therefore, to make such changes as come within the scope of my invention. For example, I may find in place of reciprocating the cut-out I may rotate the same, it only being necessary to properly frame a single picture at the optical axis during a portion of its travel through the same or a portion of one picture and a portion of another, amounting to a single picture, as it travels through the optical axis.

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

1. In an apparatus for animated pictures, a film, means for moving the same, a revoluble solid body of transparent material, mounted to present flat and angular faces and disposed in the optical axis, and means for revolving said body at different speeds as the film is moved so that the pictures are properly presented.

2. In an apparatus for animated pictures, a film, means for moving the same, a solid body of transparent material, in the optical axis mounted to present flat and angular faces, and means for revolving said body as the film moves, so that a flat surface of said body is presented when a complete picture is in position in the optical axis and when a

portion of one picture and the portion of another picture on the film is in the optical axis, the angle of said body is presented in order to project both portions of said pictures.

3. In an apparatus for animated pictures, means for moving the film, a revoluble transparent body constructed to present flat and angular faces, and an apertured slide means operating synchronously with the film to slightly raise and lower the slide as the film moves so as to properly frame the pictures on the film.

4. In an apparatus for animated pictures, means for moving the film, a revoluble transparent body constructed to present flat and angular faces, an apertured slide, and means for moving said slide in conjunction with the movement of said film.

5. In an apparatus for animated pictures, the combination of a rotatable transparent body in the optical axis for properly projecting the picture of an apertured slide, and connections whereby said body and slide can be simultaneously actuated.

6. In an apparatus for animated pictures, means for moving the film, a transparent body, means for turning the same, and means for retarding and accelerating its revolutions with respect to the moving film.

7. In an apparatus for animated pictures, means for moving the film, and a lever having one end located against said film and projecting in order to be operated by hand and so arranged that the same can be operated to press against the film and thus draw down the picture to the proper point, and operated in the other direction to remove the pressure from the film.

8. In an apparatus for animated pictures, means for moving the film, a body of transparent material having flat faces, eccentric gears for rotating said body to present a flat surface thereof when a complete picture is in position in the optical axis and to present an angle of said body when portions of two adjacent pictures on the film are in the optical axis.

9. In an apparatus for animated pictures, means for moving the film, a revoluble transparent body adapted to present alternate flat and angular faces in the optical center, and means adapted to move in conformity with the movement of said body and film in order to properly frame the picture at the optical axis.

10. In an apparatus for animated pictures, means for removing the film, a body of transparent material having flat faces mounted in the optical axis and means for imparting variable rotary motion to said body, whereby the pictures will be properly presented.

11. In an apparatus for animated pictures, in combination with means for moving the film, a body composed of transparent material having flat faces of equal length whereby proper portions of the adjacent picture will be reflected, and means for reflecting said

body as the film moves so as to properly project the pictures.

12. In an apparatus for moving pictures, means for presenting the film in a curved contour in cross-section at the optical axis.

13. In an apparatus for animated pictures, means for moving the film, and means situated below the optical axis which is adapted to be operated to press against the film and thus draw down the pictures to the proper point in the optical axis and is adapted to be operated in the other direction to remove the pressure from the film, so that the slack of the film will be taken up before that portion of the film which is in the optical axis, is moved.

14. In a moving-picture apparatus, the combination with mechanism for continuously moving a picture film, or surface, and an optical system for compensating for such movement by projecting the images of the pictures to the same point, of a device having one or more apertures of dimensions to expose a single picture and movable in unison with the film so as to expose the picture to the optical system singly and during a portion of its travel through the field.

15. In a moving-picture apparatus, the combination with mechanism for continuously moving a picture-film, and an optical system for deflecting the rays of light from successive pictures to a fixed point, of a device mov-

able in unison with the film for exposing the picture to the optical system singly and during a portion of its travel through the field.

16. In a movable-picture apparatus, the combination with mechanism for continuously moving a picture-film, and an optical system for deflecting the rays of light from successive pictures to a fixed point, of a cut-out having one or more apertures which follow the movements of the pictures through a portion of their travel so as to expose the pictures to the optical system in succession.

17. In a moving-picture apparatus, the combination with mechanism for continuously moving a picture-film, and an optical system for deflecting the rays of light from successive pictures to a fixed point, means intermediate the picture-film and the optical system and having a slot which affords an aperture of sufficient width to expose a single picture and of such form as to follow the movements of the picture through a portion of its travel.

18. In an apparatus for moving pictures, means for presenting the film in curved contour at the optical axis, in a plane at a right angle to the line of movement of said film.

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