No. 647,529. Patented Apr. 17, 1900.

E. SCHNEIDER.

KINETOSCOPE.

(Application filed Sept. 20, 1899.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

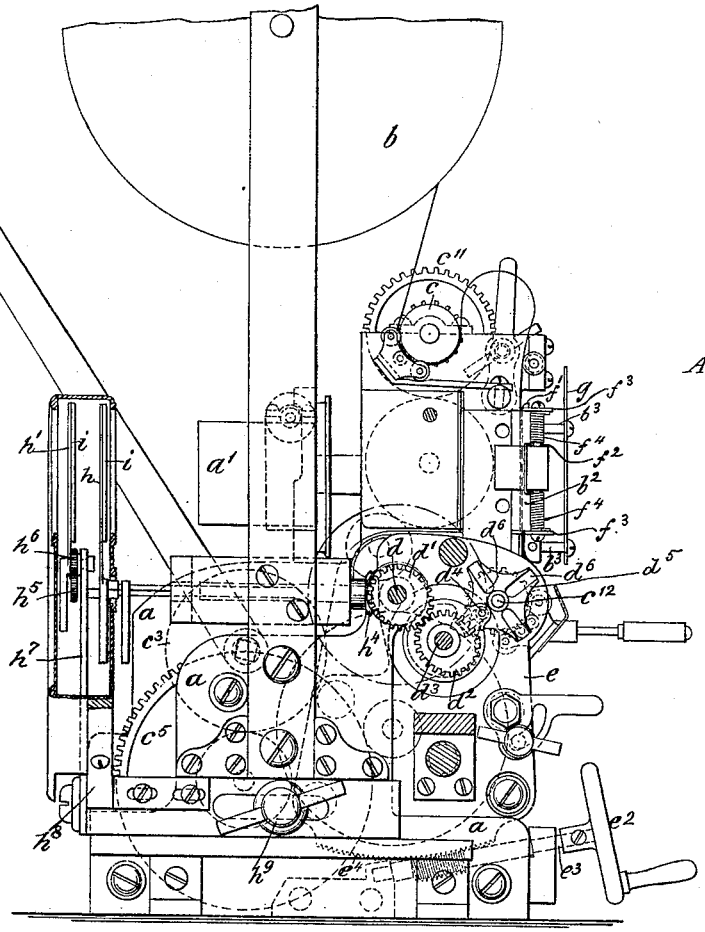


FIG. 3.

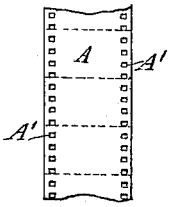
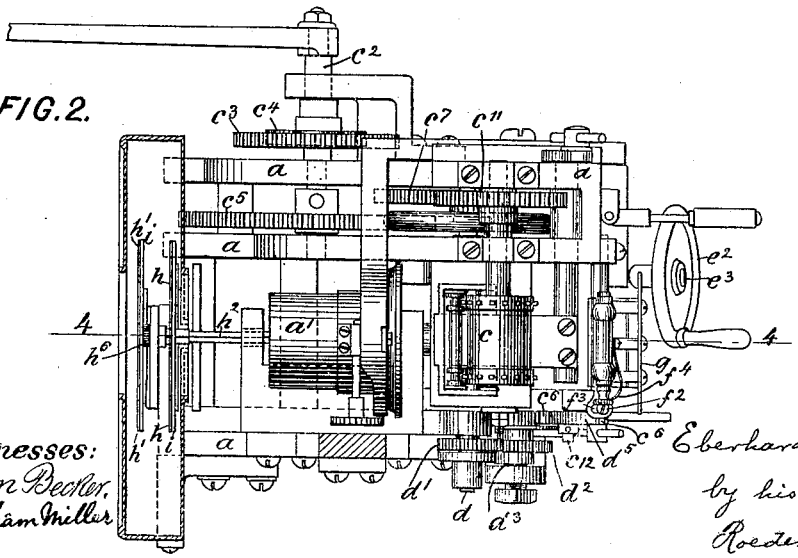


FIG. 2.



Witnesses:
John Becker.
William Miller.

Inventor:
Eberhard Schneider
by his attorneys
Roeder & Briesen

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FIG. 4.

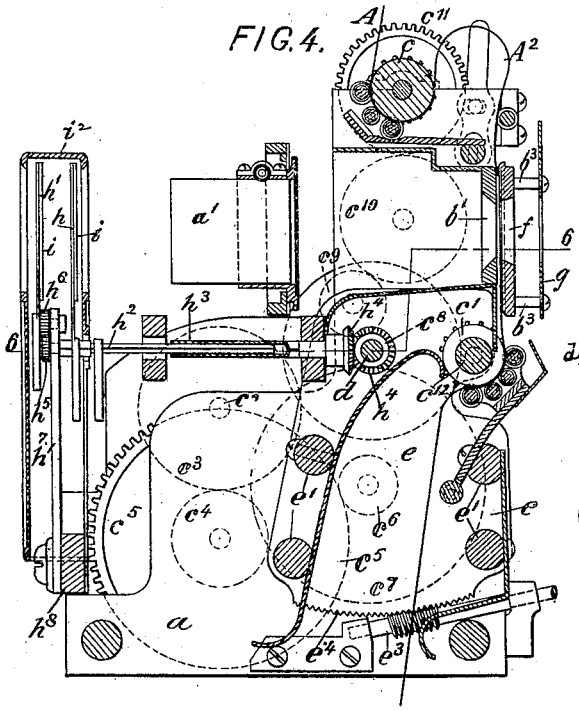


FIG. 5.

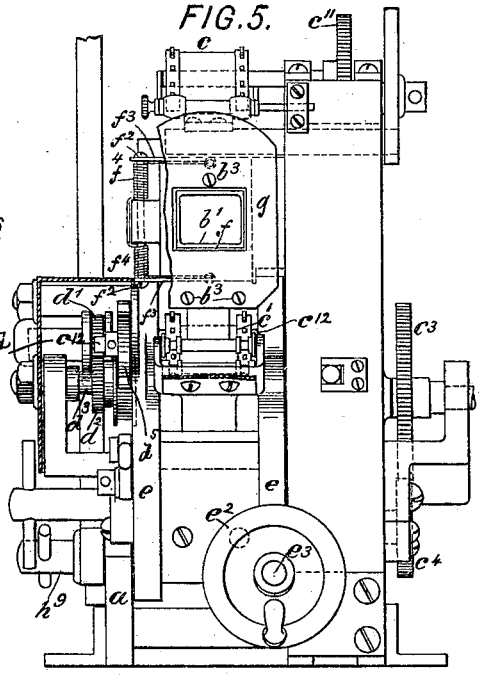


FIG. 9.

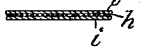


FIG. 6.

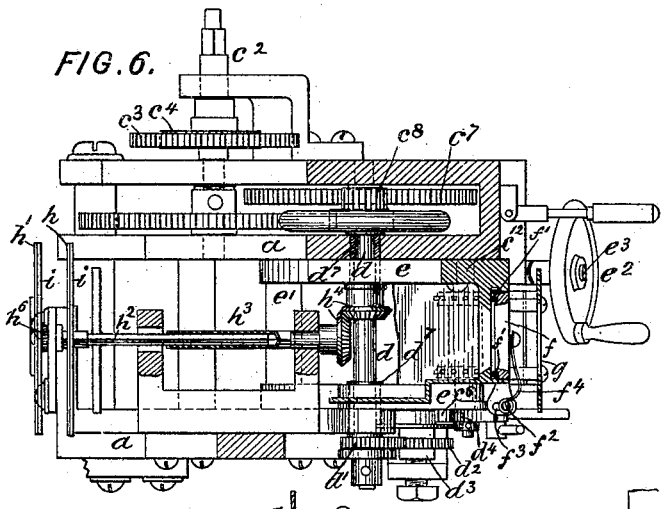


FIG. 8.

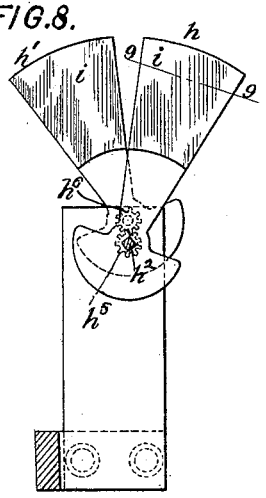
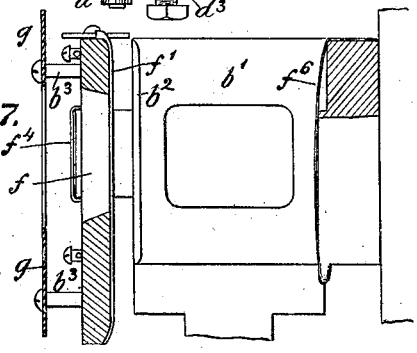


FIG. 7.



Witnesses
John Becker
William Miller

Inventor:
Eberhard Schneider
by his attorneys
Roeder & Briesen

UNITED STATES PATENT OFFICE.

EBERHARD SCHNEIDER, OF NEW YORK, N. Y.

KINETOSCOPE.

SPECIFICATION forming part of Letters Patent No. 647,529, dated April 17, 1900.

Application filed September 20, 1899. Serial No. 731,058. (No model.)

To all whom it may concern:

Be it known that I, EBERHARD SCHNEIDER, a citizen of Germany, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Kinetoscopes, of which the following is a specification.

This invention relates to a kinetoscope of novel construction, in which the feed of the film is improved and an image of clearer outline presented.

It consists more particularly in novel means for centering the film, for intermittently advancing it, for guiding and protecting its exposed section, and for covering it during motion, all as hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of my improved kinetoscope; Fig. 2, a plan thereof, partly in section; Fig. 3, a detail of part of the film; Fig. 4, a vertical longitudinal section on line 4 4, Fig. 2; Fig. 5, a rear view, partly in section, of the apparatus; Fig. 6, a horizontal section on line 6 6, Fig. 4; Fig. 7, a rear view, partly in section, of the film-guide, showing the door open; Fig. 8, a rear view, partly in section, of the shutter; and Fig. 9, a cross-section on line 9 9, Fig. 8.

The letter a represents the frame of the machine.

a' is the lens-tube.

b is the film-reel, and b' the perforated plate, over which the film A is drawn to throw the image upon the screen.

The film A is perforated along both of its edges, as usual, Fig. 3, the perforations A′ being engaged by an upper and a lower double sprocket-wheel $c\,c'$, of which the upper wheel c receives continuous rotary motion from the power-shaft c^2 by a train of gearing $c^3\,c^4\,c^5\,c^6\,c^7\,c^8\,c^9\,c^{10}\,c^{11}$. The lower sprocket-wheel c' receives intermittent rotary motion in a manner hereinafter described, so that the successive images on the film are exposed at proper intervals, a loop A^2 being formed by the film between the wheel c and plate b' to compensate for this motion.

It frequently happens that the perforations A′ are on different films placed at different distances from the bottom lines of each of the pictures, and therefore it is desirable to adjust one of the wheels $c\,c'$ so as to accurately center the pictures opposite the lens. To this effect I have devised the following construction: Within the frame a are hung on bushings d^7 a pair of parallel cheeks e, connected by braces e' and bearing the shaft c^{12} of wheel c'. The cheeks e may be oscillated upon bushings d^7 by means of hand-wheel e^2, a worm on the shaft e^3 of which engages a segmental rack e^4, formed on the lower edge of one of the cheeks e. By setting the cheeks e forward or backward the wheel c' will be correspondingly set, and thereby slightly raised or lowered to properly adjust the film A in relation to the lens.

The intermittent rotating motion of wheel c' is derived from shaft d, turning in bushings d^7, and which is continuously rotated from power-shaft c^2 by gear-wheels $c^3\,c^4\,c^5\,c^6\,c^7\,c^8$. Upon the shaft d is mounted an elliptical gear-wheel d', that meshes into an intermediate elliptical gear-wheel d^2, revolving on a shaft d^3, carried by one of the cheeks e. The wheel d^2 is provided with a stud or roller d^4, that engages successively the notches d^6 of wheel d^5, fast on shaft c^{12}. This device constitutes, in effect, a Geneva movement for intermittently driving the wheel c'. By the use of the two elliptical wheels $d'\,d^2$ the speed of transmission is accelerated when the longer radius of wheel d' is opposite the shorter radius of wheel d^2, Fig. 1, which position is reached during the engagement of roller d^4 with slots d^6. In this way the periods of motion of the film are accelerated, while the periods of exposure are correspondingly increased, thus adding greatly to the clearness of the image thrown upon the screen.

The film A is pressed against the plate b' by means of a perforated door f, provided with a pair of forwardly-projecting vertical rails f', Fig. 6, by means of which the frictional contact between the film and the door is reduced. The door is so hung that it can recede in a rectilinear direction from the film, so as to permit the free passage of the thickened joints between sections of the film. For this purpose the pintle f^2 engages slotted arms f^3 of door f, while a spring f^4 tends to normally close the door against the film. When a thickened portion of the film bears against the rails f', the door will be moved

backward uniformly in successive vertical planes, to be immediately returned to its normal position by spring f^4 as soon as the obstacle has been cleared. A spring f^6, pressing against one edge of film A, holds the opposite edge of the film against a flange b^2 of plate b', so as to steady the film against lateral movement. To the rear face of door f is attached at a distance therefrom a perforated fire-shield g by means of pins b^3. This shield serves to protect the film against overheating from the source of light.

The shutter that conceals the image during the movement of the film is composed of two wings h h', which by rotating simultaneously in opposite directions produce a quicker motion for the shutter to increase the periods of exposure. The movement of the wings may be obtained in a suitable manner, the drawings showing the wing h mounted upon a squared shaft h^2, which is telescoped by a squared hollow shaft h^3, driven from shaft d by bevel-wheels h^4. A pinion h^5 on shaft h^2 rotates wing h' by pinion h^6, such wing being pivoted to a post h^7. In order to permit the shutter to be adjusted, the outer end of shaft h^2 is hung in the post h^7, projecting upwardly from a slide h^8, which is held in position by clamp-screw h^9. The object of making the shutter adjustable is to maintain a uniform distance between it and the lens, the latter being adjustable, as usual, to set the machine for long and short foci. Each of the wings h h' is faced at its inner side by a mirror i, which I have found to greatly increase the sharpness of the image by preventing darkening reflections from the opaque surface of the shutter from blurring the picture. The front of the wings may also be provided with mirrors i' for a like purpose. The wings are inclosed by a perforated casing i^2 to shield the operator against accidental contact. The corners of the wings should be round to avoid spectral colors.

Practical tests have demonstrated that a shutter having a mirror displays an image which is by far more clear than that displayed by a shutter not having a mirror. The reason for this is, as I believe, that a mirror with clean rounded edges does not mix any lines into the sight-opening at the time the picture is exposed. The mirror-shutter, though impenetrable to rays of light, comes nearest in effect to that of pure air, and therefore occasions the least blurring of the sight-opening, as can be readily demonstrated by revolving a mirror-shutter and a milky-white shutter side by side.

What I claim is—

1. In a kinetoscope, the combination of a pair of connected pivoted cheeks, having a toothed segment, a worm engaging the same and journaled in the frame, and a sprocket-wheel adapted to engage the film and journaled in said cheeks, substantially as specified.

2. In a kinetoscope, the combination of a pair of sprocket-wheels adapted to engage the film, with means for rotating one of said sprocket-wheels, means for intermittently rotating the other sprocket-wheel, a pair of pivoted cheeks in which one of the sprocket-wheels is journaled, and means for oscillating said cheeks, substantially as specified.

3. In a kinetoscope, the combination of a rotating shaft, with an elliptical gear-wheel mounted thereon, a second intergeared elliptical gear-wheel having a stud, a sprocket-wheel adapted to engage the film, and a notched wheel mounted upon the shaft of the sprocket-wheel and adapted to be engaged by the stud, all being so arranged that the major axes of the elliptical wheels are in alinement during the engagement of the stud with the notches of the notched wheel, substantially as specified.

4. In a kinetoscope, the combination of a perforated plate with a perforated door having slotted arms, a pintle engaging said arms, and a spring for holding the door in its closed position, substantially as specified.

5. In a kinetoscope, the combination of a perforated plate having a flange, with a perforated door, means for allowing a rectilinear motion of the door toward and away from the plate, and a spring adapted to press the film laterally against the flange, substantially as specified.

Signed by me at New York city, county and State of New York, this 18th day of September, 1899.

EBERHARD SCHNEIDER.

Witnesses:
F. v. BRIESEN,
WILLIAM SCHULZ.