No. 628,413. Patented July 4, 1899.

F. McMILLAN & A. C. ROEBUCK.

KINETOSCOPIC APPARATUS.

(Application filed Feb. 25, 1898.)

(No Model.)

Fig. 1.

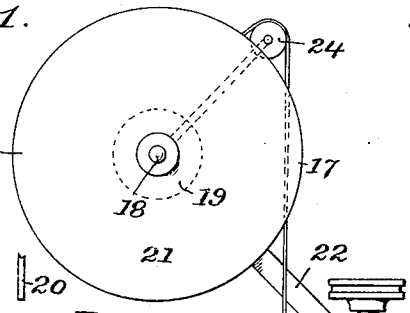


Fig. 4.

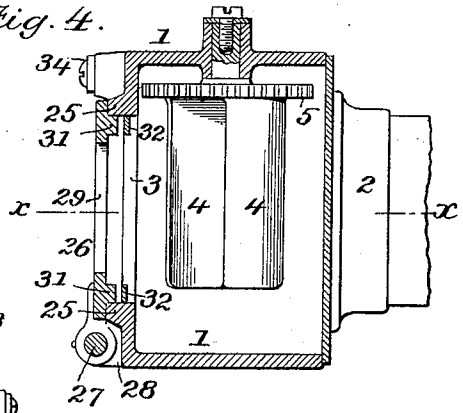


Fig. 2.

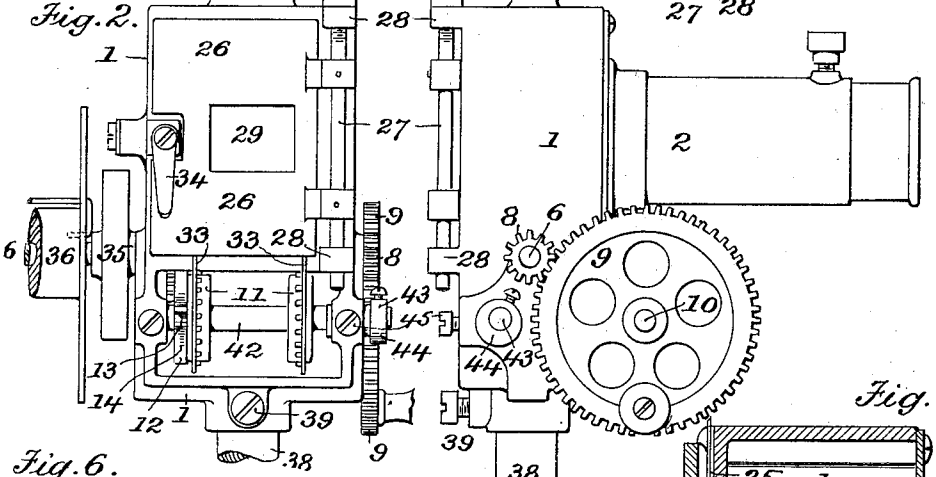


Fig. 6.

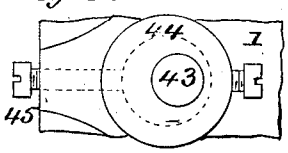


Fig. 3.

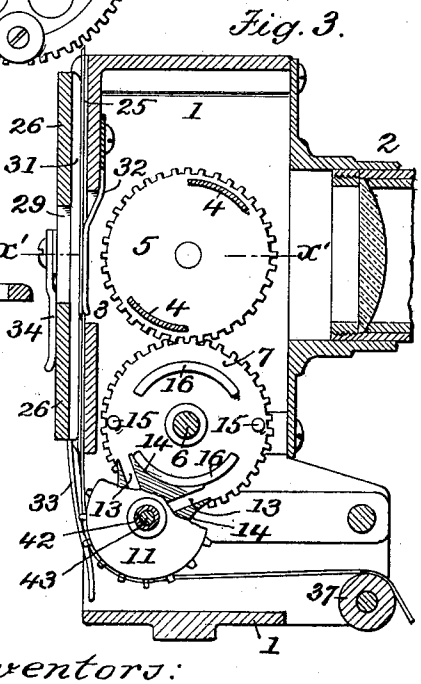


Fig. 7.

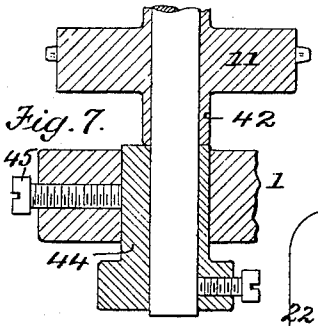
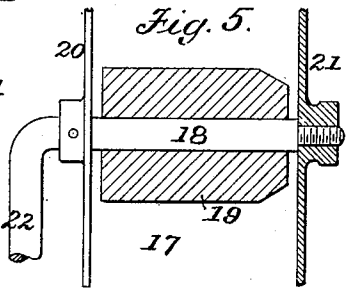


Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANK McMILLAN AND ALVAH C. ROEBUCK, OF CHICAGO, ILLINOIS.

KINETOSCOPIC APPARATUS.

SPECIFICATION forming part of Letters Patent No. 628,413, dated July 4, 1899.

Application filed February 25, 1898. Serial No. 671,662. (No model.)

To all whom it may concern:

Be it known that we, FRANK McMILLAN and ALVAH C. ROEBUCK, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Kinetoscopic Apparatus; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to that class of kinetoscopic apparatus in which a series of pictures upon a transparent film is employed to produce the appearance of objects in motion.

A principal object of the present improvement is to provide a simple and efficient arrangement and connection between the film-operating drum and the shutter by which the passage or projection of the light through the film is controlled, so that a positive intermittent rotary motion is imparted in a positive manner to the one while the other is held at rest in a like positive manner, and vice versa, so that the beams of light will be projected through the pictured film only when the same is in a stationary condition and such light-beams cut off from the film while the same is moving to the next picture of the series.

Other auxiliary objects of the present improvement are to provide simple and convenient means for rewinding the film, so as to be ready for reuse, for confining the film upon the holding-reel, for guiding the film in front of the light-opening of the apparatus, and for adjusting the intermittent gearing of the feed-roller and shutter to take up wear and consequent lost motion in the parts, as well as other detail features of construction, whereby the usefulness and convenience of the apparatus are increased, as will hereinafter more fully appear and be more particularly pointed out in the claims.

We attain such objects by the construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of an apparatus embodying the present improvements; Fig. 2, a detail rear elevation of the same; Fig. 3, an enlarged detail longitudinal section at line x x, Fig. 4; Fig. 4, an enlarged detail horizontal section at line x' x', Fig. 3; Fig. 5, an enlarged detail sectional elevation of the holding-reel; Fig. 6, an enlarged detail side elevation of the eccentric adjustment for the shaft of the film-feeding roller; Fig. 7, a horizontal sectional elevation of the same.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the main casing of the present apparatus, having a rectangular box shape, the front thereof being closed by a removable plate carrying the objective-mount 2, while the rear thereof is closed by a plate formation having a light-opening 3 therein central with the axis of the objective.

Within the casing 1 is arranged, horizontally, a revolving shutter, the horizontal axis of rotation of which is at right angles to the axis of the objective 2, said shutter consisting of a pair of concentrically-arranged segmental blades 4, that are secured at one end to a carrying-disk 5, that may be of the nature of a gear-wheel, as shown, and which is journaled by means of a carrying-arbor in the end wall of the casing 1, as shown in Fig. 4. A continuous rotary motion is imparted to the shutter by means of a counter-shaft 6, provided with a gear-wheel 7, meshing with and driving the counterpart gear-wheel 5 on the journal-arbor of the shutter. The counter-shaft 6 is in turn in operative connection, by means of a pinion 8 and gear-wheel 9, with a driving-shaft 10, that is usually operated by hand.

11 is the film-feeding roller, of any usual construction and provided with the usual peripheral spurs adapted to engage the usual series of spaced orifices in the margin of the pictured film to effect a positive feed of the same. In the present improvement the journal-shaft of the feeding-roller 11 is provided with an intermittent gear-wheel 12, the periphery of which is formed with alternating radial recesses 13 and marginal convex depressions 14, usually four in number of each. The said gear-wheel 12 has operative connection with the counter-shaft 6 by means of a pair of studs 15, arranged diametrically opposite each other on a disk on said shaft, usually the gear-wheel 7, as shown, such studs

being adapted to engage in turn in the radial recesses 13 of the gear-wheel 12 and impart an intermittent one-quarter revolution to the same and to the film-feeding roller 11. In the interval between such intermittent actuation of the film-feeding roller the same is positively held in a stationary condition by the engagement of one of the concentrically-arranged rim-sections 16 on the side of the gear-wheel 7 in the adjacent convex marginal recess 14 of the gear-wheel 12.

In the present improvement the above-described mechanism will be assembled in such a manner that the shutter will close off the passage of light through the casing during the interval of time in which the actuating movement of the film-feeding roller is being effected, the movement of the shutter to permit the passage of the light occurring while the film and the film-feeding roller are at rest.

17 is the film-holding reel, which in the present improvement comprises a central shaft 18, adapted to loosely receive a spool 19, upon which the film is wound, a disk 20, fixed near one end of said shaft, and a disk 21 at the other and free end of said shaft and removably attached thereto by its hub portion screwing upon the screw-threaded outer end of said shaft, as illustrated in Fig. 5. In the present construction the shaft 18 is carried upon one end of a radial arm 22, the other end of which has pivotal connection with a pivot-lug on the top of the casing 1, as shown in Figs. 1 and 2, so that a radial adjustment of the reel can be effected as required, the parts being held to the required adjustment by means of a set-screw 23, screwing through the aforesaid pivot-lug and bearing upon the pivot-arbor of said radial arm 22.

24 is a loose tension-roller journaled at the outer end of a spring-arm that extends outward from the central reel-shaft 18 and over which roller 24 the film passes and is directed into the guide-passage therefor in the main casing, as hereinafter set forth.

25 are vertically-extending ribs on the outer surface of the rear plate formation of the casing 1, such ribs having a parallel arrangement at each side of the light-opening 3 in said plate formation and acting as guides for the pictured film in its passage past the light-opening 3 to prevent any lateral movement or shifting of the film.

26 is the film confining and guiding plate of the present improvement, hinged in a vertical direction at one edge of the casing by means of a pintle-rod 27, fixedly attached to the pintle-eyes on the said plate 26 and adapted to turn in the pintle-eyes 28 of the main casing. Said pintle is also adapted to have an endwise movement in a vertical direction in the pintle-eyes 28 of the casing, so as to effect a vertical adjustment of the film-confining plate 26 and bring the light-opening 29 therein in proper position with relation to the axis of the objective, as well as with relation to the series of pictures upon the film. Such adjustment is effected by means of a hand-nut 30, screwing upon the screw-threaded upper end of the pintle 27 and having bearing against the uppermost pintle-eyes 28 of the main casing, as shown in Figs. 1 and 2.

31 are vertically-extending ribs on the inner surface of the confining-plate 26, having a parallel arrangement at each side of the light-opening 29 therein. These ribs are so arranged as to lie inside the ribs 25 on the main casing and form vertical guide-tracks for the margin of the film, which margin is held in contact with said tracks by the spring-fingers 32, attached to the casing 1, as shown.

33 are spring-fingers projecting down from the lower ends of the confining-plate 26 and adapted to guide and hold the film to its engagement with the film-feeding roller 11.

The hinged arrangement of the confining-plate 26, as above described, permits of a ready insertion of the film into place in the apparatus, as well as ready access to the same when required, and such plate will be provided with a suitable fastening—such, for instance, as the turn-arm 34—to secure said plate in its closed position.

In the present improvement the countershaft 6 is extended out at the far side of the main casing and is provided with a fly-wheel 35 and a rewinding-reel 36 for the convenient rewinding of the film after the same has passed through the apparatus, so as to be ready for use.

37 is an idler-roller at the lower and forward end of the casing, over which the film passes as it comes from the feeding-roller 11.

In the present improvement the casing 1 is adjustably secured to a vertical column 38 by means of a set-screw 39, passing through a hub or collar on the bottom of the casing, as shown, and said column is in turn secured in a vertically-adjustable manner in the hub or collar portion of the base 40 by means of a set-screw 41, such construction being intended to permit of the ready and convenient vertical adjustment of the apparatus to fit different sizes of magic-lanterns and the like in the use of the present apparatus in connection therewith.

The journal-shaft 42 of the film-feeding roller 11 is of a tubular nature and turns on a fixed shaft 43, that at each end is fixedly connected to eccentric bushings 44, arranged in the side walls of the casing 1, so that by the rotary adjustment of said bushings the required fit between the intermittent driving-gearing of the film-feeding roller 11 is readily and quickly effected.

45 are set-screws for holding the eccentric bushings 44 to their required adjustment.

The present invention is more especially adapted to display pictures already formed on a film. It is evident, however, that with very slight changes and additions the present apparatus could be employed for taking a series of pictures photographically.

Having thus fully described our said inven-

tion, what we claim as new, and desire to secure by Letters Patent, is—

1. In a kinetoscopic apparatus, the combination with the light-controlling and film-feeding mechanism thereof, of a main casing, a film-confining plate provided with a light-opening, and hinged to the casing by a vertical hinge, the pintle of such hinge being fixed to the film-confining plate, and formed with a screw-threaded upper end, and a hand-nut engaging such threaded pintle end to effect a vertical adjustment of the film-confining plate, substantially as set forth.

2. In kinetoscopic apparatus, the combination with the light-controlling and film-feeding mechanism therefor, of a main casing, a film-confining plate provided with a light-opening, and hinged to the casing by a vertical hinge, vertical guide-tracks upon the film-confining plate at each side of the light-opening in the same affording a bearing for the face of the film, and spring-fingers secured to the casing and adapted to hold the margin of the film in contact with such tracks, substantially as set forth.

3. In kinetoscopic apparatus, the combination with the light-controlling and film-feeding mechanism thereof, of a main casing, a film-confining plate provided with a light-opening and hinged to the casing by a vertical hinge, vertical guide-tracks upon the film-confining plate at each side of the light-opening in the same, spring-fingers secured to the casing and adapted to hold the margin of the film in contact with such tracks, and spring-fingers on the lower end of the film-confining plate adapted to hold the film in engagement with the feeding-roller of the intermittent film-feeding mechanism, substantially as set forth.

4. In a kinetoscopic apparatus, the combination with the main casing, of a revolving shutter, a film-feeding roller, a counter-shaft geared with the shutter to impart continuous motion thereto, and with the film-feeding roller to impart an intermittent rotary motion thereto, such connection with the film-feeding roller comprising a gear-wheel on the shaft of the roller formed with alternate radial recesses and concave marginal recesses, and an operating gear-wheel on the counter-shaft formed with oppositely-arranged studs and intermediate concentrically-arranged rim-sections, a stationary shaft forming a bearing for the film-feeding roller, eccentric bushings supporting said shaft at its respective ends, and means for securing said bushings at their required adjustment, substantially as set forth.

In testimony whereof witness our hands this 21st day of February, 1898.

FRANK McMILLAN.
ALVAH C. ROEBUCK.

In presence of—
ROBERT BURNS,
JAMES LAVALLIN.