R. E. LoRENTZ.

MOVING PICTURE APPARATUS.

APPLICATION FILED JAN. 8, 1912.

1,126,645. Patented Jan. 26, 1915.

Fig. 1.

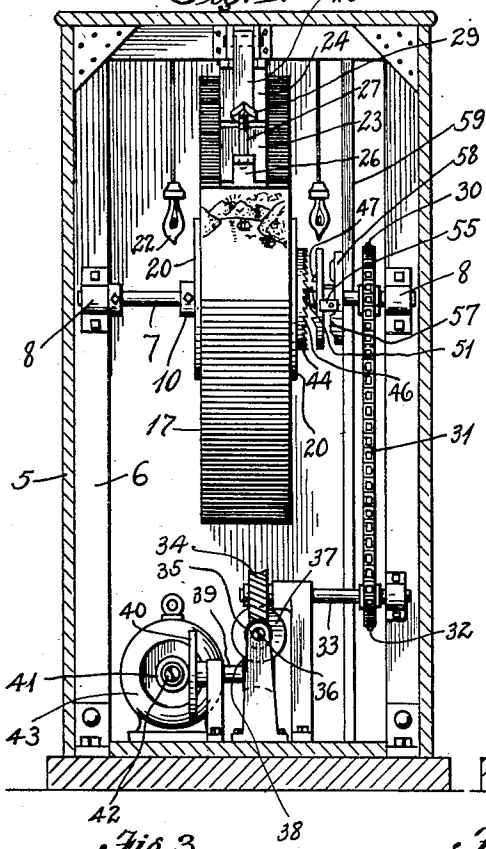


Fig. 2.

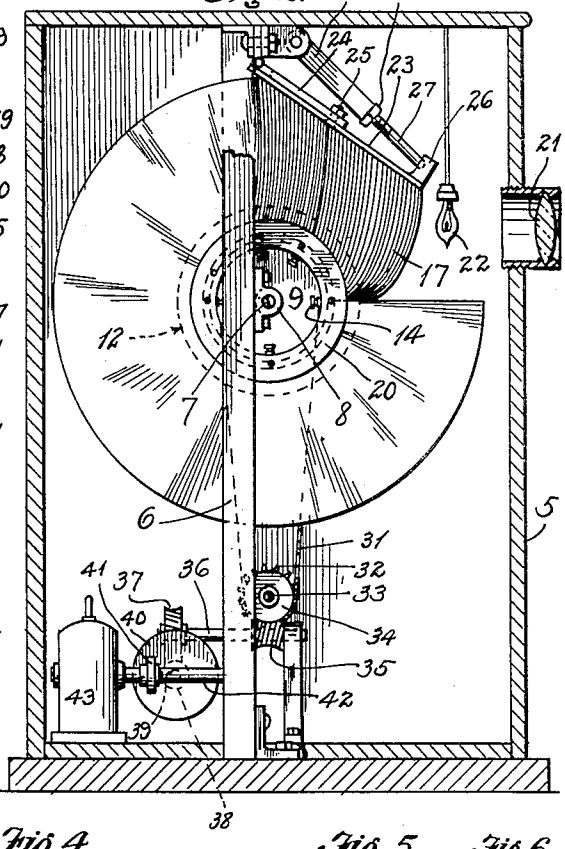


Fig. 3.

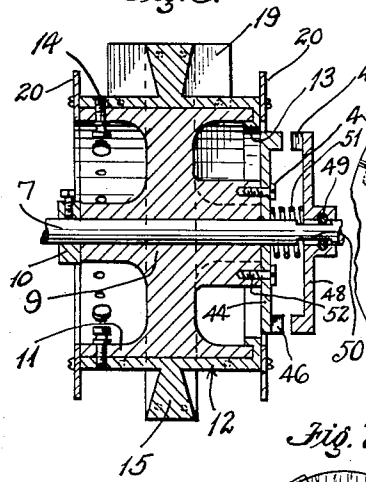


Fig. 4.

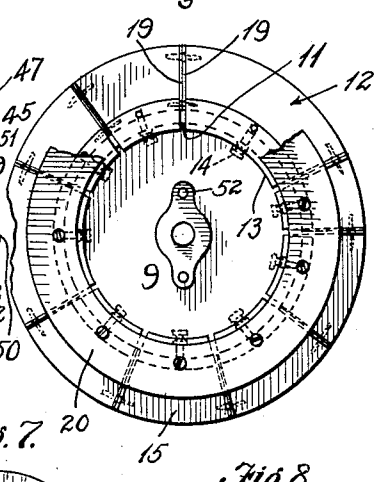


Fig. 5.

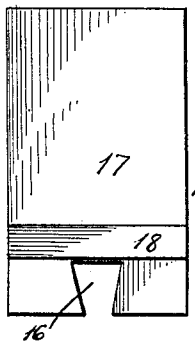


Fig. 6.

Fig. 7.

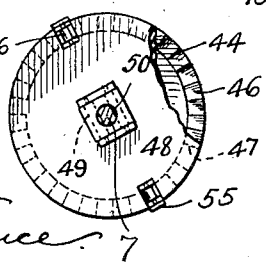


Fig. 8.

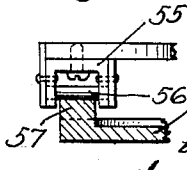
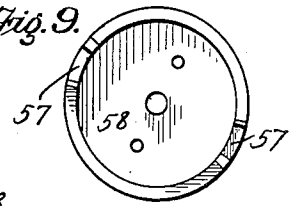


Fig. 9.



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UNITED STATES PATENT OFFICE.

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MOVING-PICTURE APPARATUS.

1,126,645. Specification of Letters Patent. Patented Jan. 26, 1915.

Application filed January 8, 1912. Serial No. 669,944.

To all whom it may concern:

Be it known that I, RALPH E. LO RENTZ, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Moving-Picture Apparatus, of which the following is a specification.

This invention relates to moving picture apparatus and especially to that type of mechanism in which a series of cards are brought into picture reflecting position successively and at a desired speed.

It is an object of the invention to provide a device of this class in which the pictures may be quickly moved in passing the lens of the mechanism but will be intermittently held stationary at proper periods.

It is also an object of the invention to provide an adjustable card holding means for retarding them at the proper place for exhibiting pictures.

In the accompanying drawing forming a part of this specification, Figure 1 is a transverse sectional view taken through the casing of the improved moving picture apparatus, the interior working parts being shown in elevation. Fig. 2 is a longitudinal vertical sectional view through the casing of the device, the working parts being shown in side elevation. Fig. 3 is an enlarged central sectional view through the drum which carries the picture cards, the clutch mechanism controlling the same being also shown. Fig. 4 is a side elevation of the drum carrying the picture cards, the sections secured to the periphery thereof being illustrated, and portions of the side retaining ring being broken away. Fig. 5 is a side elevation of a picture card as employed in the machine. Fig. 6 is an edge elevation of a number of cards showing their relative position upon the drum which carries them. Fig. 7 is a side elevation of the clutch mechanism employed in periodically moving the picture drum, a portion of the outer member of said clutch being broken away to show the teeth upon the inner member thereof. Fig. 8 is an enlarged fragmentary detail view showing one of the rollers employed upon the outer clutch plate and one of the cams upon the adjacent cam plate engaging the same. Fig. 9 is a side elevation of the cam plate for operating the clutch.

The details and features of the invention will now be more particularly described reference being had to the said drawing in which—

5 indicates a casing which may be of any suitable size and shape and within which a supporting frame 6 is mounted extending vertically and transversely of the frame. Journaled upon the said frame 6 is a transverse shaft 7 engaging journal boxes 8 secured to the said frame. The shaft 7 carries the picture drum of the mechanism, said drum being made up of a hub portion 9 which runs loosely upon the shaft 7 and is limited against slipping thereon in one direction by a collar 10 which is clamped thereon. The hub has a rim portion 11 with broad side flanges to which are secured outer rim sections 12 adapted to hold the picture cards of the mechanism. The said picture sections are made of different lengths, each of said sections being preferably made of a proper size to receive a given group of pictures, or a group of pictures relating to a particular subject.

The rib sections 12 are provided with hook shaped flanges 13 at one edge adapted to hook upon the rim 11 of the hub and the other edge of each section is held in place with respect to the hub by means of set screws 14 which are passed through coinciding apertures in the said sections and the rim of the hub as clearly shown in Fig. 3. Each of said rim sections 12 is formed with a central peripheral tenon 15 extending from one end of the section to the other. The said peripheral tenons are adapted to engage correspondingly shaped mortises or recesses 16 formed upon picture cards 17 as illustrated in Fig. 5 of the drawing. The picture cards are slipped upon the mortises 15 of each section and are spaced with respect to each other by means of transverse bars or strips 18 applied to one face of each card. The strips 18 are located near the mortises 16 permitting the inner edges of the cards to come together, while the outer edges of said cards are forced by the said strips to spread to a suitable degree with respect to each other as shown in Fig. 6. In order to hold each group of picture cards upon each rim section, end plates 19 are secured to the ends of the sections, usually by removable screws. After the rim sections have been supplied with a group of picture cards and secured upon the periph-

ery of the rim 11, edge securing plates or rings 20 are secured to the edges of the said rim sections by suitable screws, the said rings operating to hold the picture cards in perfect alinement. The cards when thus mounted upon the rim sections of the drum are ready to be brought in position opposite an opening in the casing 5 provided with a lens 21. One or more lights 22, usually electric lamps, are mounted in the casing 5 so as to reflect light upon the pictures in projecting them through the lens, 21. As the picture drum is rotated to bring the pictures successively before the lens in the usual manner in such devices, they are held by a retarding plate 23 which is adjustably connected with a hinge plate 24. The said hinge plate has a hinged connection with the upper transverse portion of the frame 6 and is provided with an elongated slot indicated in dotted lines in Fig. 2 in which a screw bolt 25 is adapted to be set for holding the retarding plate 23 in desired position with respect to said hinge plate. The outer end of the plate 23 is provided with a standard 26 having a socket or recess formed therein to receive the end of a rod 27. The said rod 27 is screw threaded for a portion of its length and adapted to extend into a threaded bore formed in a hinged bar 28. A lock nut 29 also upon the threaded portion of said rod 27 is employed for holding the parts in adjusted relation to each other. The adjustment of the plate 23 and the rod 27 is such as to cause the said plate to bear upon the edges of the pictures as the picture wheel is turned, allowing them to fall in succession opposite the lens 21. The parts can of course be adjusted to exert a greater or a less pressure for detaining the pictures as found needful to secure a proper operation of the mechanism.

The rotation of the picture drum constitutes an important feature of the invention and particularly the means of transmitting movement to the hub of the picture drum. The mode of transmission is such that the pictures can be run successively for a given period and then held stationary for exposing a given picture for a short period of time, after which the drum will turn again. Such operation is desirable under given circumstances as for instance when advertising cards are placed upon a drum and it is desired to hold them a predetermined period before the lens. In accomplishing the rotation of the drum, the shaft 7 is turned by any suitable mechanism, but usually by means of a sprocket wheel 30 which is secured upon the said shaft 7 and is connected by means of a sprocket chain 31 with a sprocket wheel 32 secured to a counter shaft 33. The said counter shaft is mounted upon bearings in the framing of the mechanism and carries a worm gear 34 which meshes with a worm 35 secured to a shaft 36 which extends at right angles to the said counter shaft 33. The shaft 36 also carries a worm gear 37 which engages and meshes with a worm 38 secured to a shaft 39 mounted at right angles to the shaft 36. The said shaft 39 carries a friction disk 40 of suitable diameter and arranged to engage a friction pinion 41 which is splined upon a motor shaft 42. The said motor shaft is connected with the armature of any suitable motor as 43, an electric motor being generally employed. By means of the mechanism thus described, the movement communicated to the shaft 7 is through frictional means so that the parts cannot be broken off if they should become caught or prevented from operating in their usual manner. The position of the friction pinions 41 opposite the face of the friction disk 40 also controls the speed of the movement imparted to the shaft 7.

It will be understood that other motive power and interconnecting means may be employed for driving the shaft 7 if desired, within the spirit of the invention.

For communicating movement from the shaft 7 to the picture wheel, a clutch device is employed, a clutch member 44 of which is secured to the hub 9 of the picture drum, and usually by means of screws 45 which engage screw threaded sockets 52 formed in lateral projections upon the said hub 9 as clearly shown in Figs. 3 and 4. The outer face of the clutch member 4 which is preferably in disk form, is provided with a series of teeth 46 arranged near the periphery of the disk. These teeth are adapted to be engaged by teeth 47 formed upon the other member 48 of the clutch. The said member 48 is arranged to so engage the shaft 7 as to turn therewith and for this purpose is provided with rollers 49 journaled at their ends in the hub of the clutch member 48 so as to lie parallel with each other and upon opposite sides of the shaft 7. The said shaft 7 is formed with oppositely arranged flat surfaces 50 so as to engage the said rollers 49. The flattened portion of the shaft is made of sufficient length to permit the clutch member 48 to be moved into and out of engagement with the clutch member 44, and said rollers 49 through their engagement with the said flattened surface 50 cause the clutch member 48 to turn with the shaft. A spring 51 mounted upon the shaft 7 and interposed between the clutch members normally tends to separate them. The clutch member 48 is adapted to be intermittently forced into engagement with the teeth of the clutch member 44 and for this purpose is provided with outwardly projecting standards 55 usually in the form of brackets within which rollers 56 are journaled. The rollers are made of suitable width to engage cams 57 which are formed upon the peripheral edges of a cam

plate 58 which surrounds the shaft 7 but is fastened to a vertical standard 59 mounted within the casing 5. The cam plate 58 is thus held stationary at all times, but as the shaft 7 rotates carrying the clutch member 48 with it, the rollers 56 will ride inwardly upon the cams 57 so that the teeth of the clutch member 48 are forced into engagement with the teeth of the clutch member 44, and the picture drum will be temporarily rotated. As soon as the rollers 56 run off from the cams 57, the clutch member will be separated again by the spring 51. The friction of the pictures upon the retarding plate 23 will then temporarily hold the said picture drum from turning. It will be understood that by regulating the cam projections of the cam plate with respect to the picture drum and also with respect to the rollers carried by the clutch member 48, the periods when the picture drum will be held stationary may be regulated.

The operation of the parts for securing an intermittent holding of the picture drum in stationary position will be automatically accomplished.

The operation of the device will be evident from the above description. The motor 43 is set in operation, the friction pinions 41 being so arranged with respect to the disk 40 as to secure a desired speed in the movement of the parts. The intermediate gearing will cause the rotation of the shaft 7, but the picture drum will not be actuated since it loosely engages said shaft 7 until the rollers 56 of the clutch member 48 engage the cams 57 of the cam plate. Upon the rollers engaging said cams, the clutch members will be brought together and the picture drum will be rotated for a desired length of time, controlled by the length of the cam surface. After the rollers drop from the cam surface and the clutch members are separated, the picture drum will stand stationary again for a short period.

What I claim is:

1. A moving picture apparatus comprising a rotating picture carrying drum, a clutch member adapted to cause the rotation of the drum periodically, a cam plate for actuating said clutch, and mechanism for rotating the clutch member adjacent to the cam plate, whereby the picture drum will be periodically rotated.

2. A moving picture apparatus comprising a rotating drum adapted to carry pictures, a clutch member connected with said drum, a rotating clutch member adapted to coöperate with the drum clutch member, spring means normally separating the clutch members, a cam plate for forcing the clutch members together at intervals, and mechanism for rotating the clutch member adjacent to the cam plate whereby the picture drum will be periodically rotated.

3. A moving picture apparatus comprising a picture drum made up of a hub section, removable rim sections secured to the periphery of said hub section, means for securing pictures to said rim sections, and means for rotating the said drum.

4. A moving picture apparatus comprising a picture drum having a hub portion formed with a securing rim, rim sections adapted to be secured to said rim having picture engaging projections extending outwardly therefrom, picture cards having notches adapted to fit upon said projections, means for holding the cards on the said sections, means for holding the cards in alinement with each other upon the picture drum, means for engaging the outer ends of said cards to properly retard them when exposing them to view, and means for rotating the said drum.

5. A moving picture apparatus comprising a picture drum made up of a hub, picture sections secured to the rim of said hub and having dovetailed tenons projecting therefrom, picture cards having mortised notches to fit upon said tenons, the said picture cards having spaces and strips mounted between them for causing their outer ends to properly spring apart and means for rotating the said drum.

6. A moving picture mechanism comprising a picture carrying drum, a retarding device comprising a hinge member, a picture engaging plate adjustably mounted thereon, and an adjustable brace for holding the said plate at the proper angle with respect to the pictures upon the said drum.

7. A moving picture mechanism comprising a picture carrying drum, a clutch member secured to said drum, a revoluble shaft supporting the drum, a clutch member movable longitudinally upon said shaft having parallel rollers mounted in its hub portion, the said shaft having parallel faces formed thereon to engage said rollers whereby the clutch member will be turned with the shaft but may move longitudinally thereon, means for normally separating the clutch members, cams for forcing the clutch members together, gearing for rotating the shaft and the clutch member carried thereby, frictional means for driving said gearing, and a motor for operating said frictional means.

In witness that I claim the foregoing I have hereunto subscribed my name this 30th day of December, 1911.

RALPH E. LO RENTZ.

Witnesses:
JOHN W. THOMAS,
EARLE R. POLLARD.