No. 865,373. PATENTED SEPT. 10, 1907.

W. FREDRICK.

AUTOMATIC LANTERN SLIDE MOVING DEVICE.

APPLICATION FILED OCT. 2, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

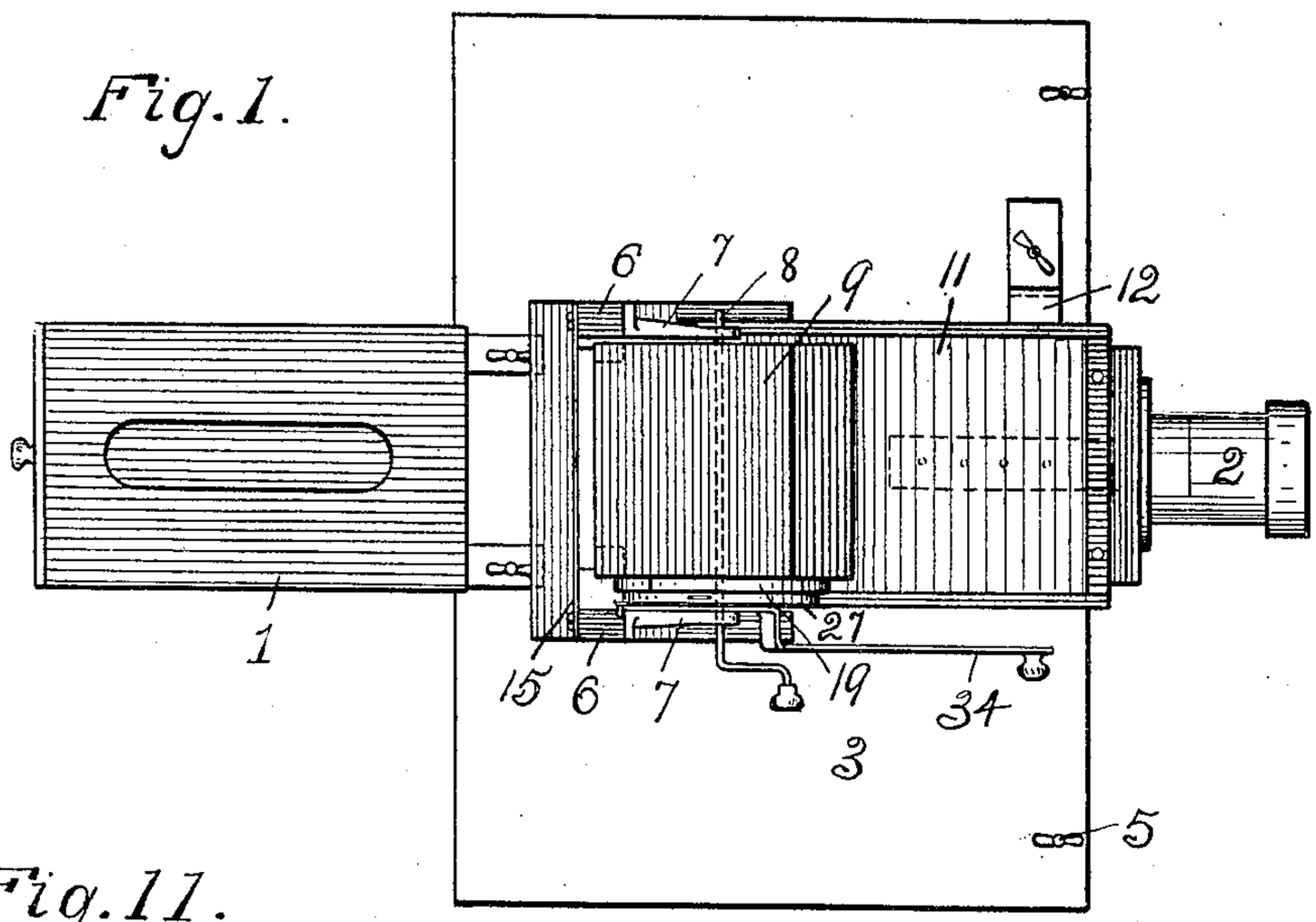

Fig. 11.

Fig. 2.

Witnesses.
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2 SHEETS—SHEET 2

Fig. 3.

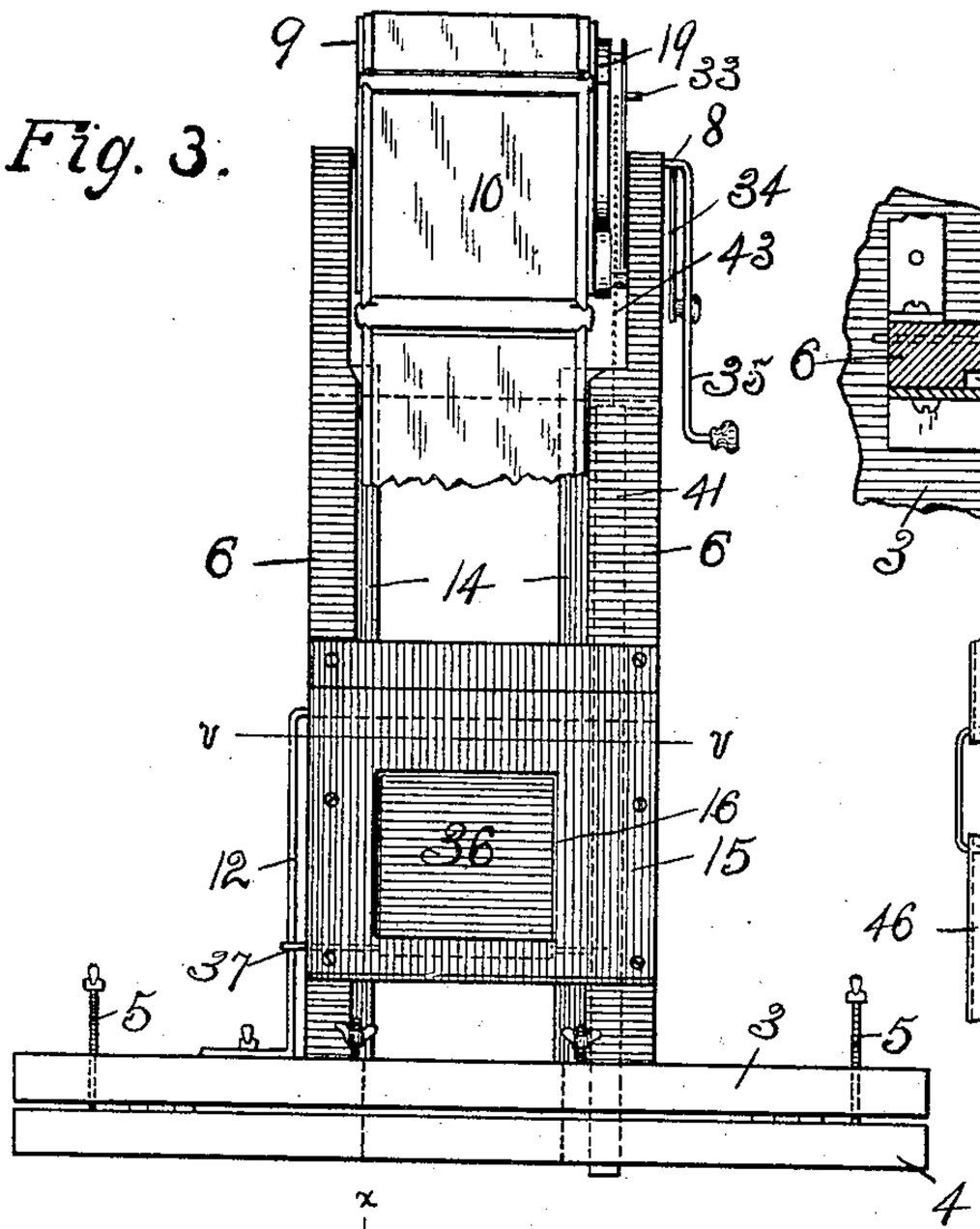


Fig. 4.

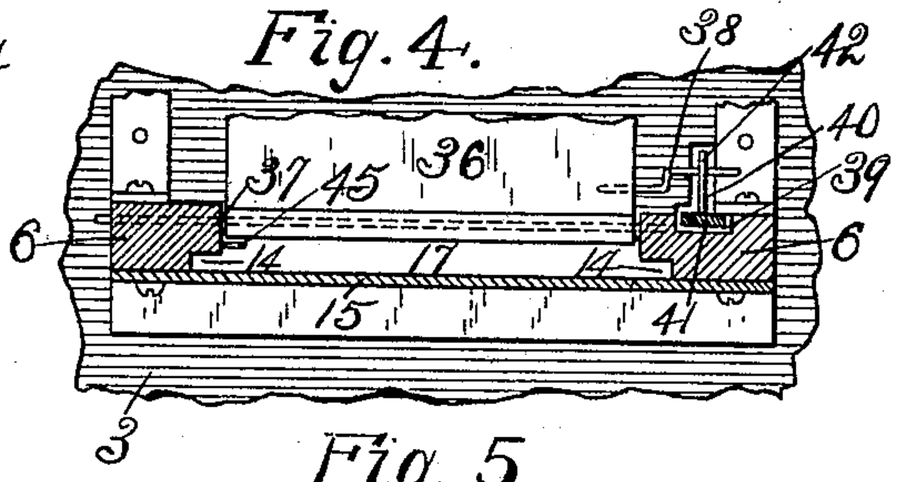


Fig. 5.

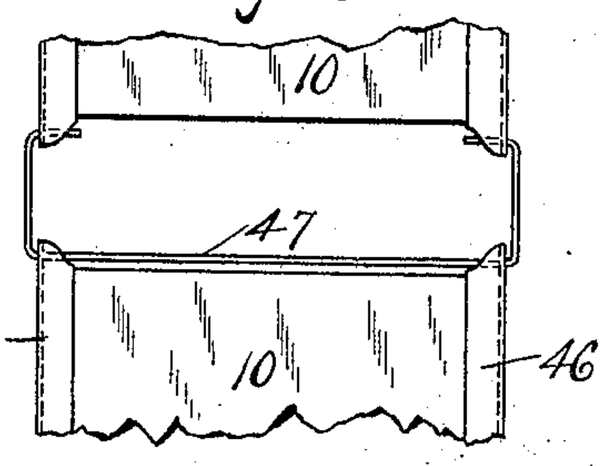


Fig. 6.

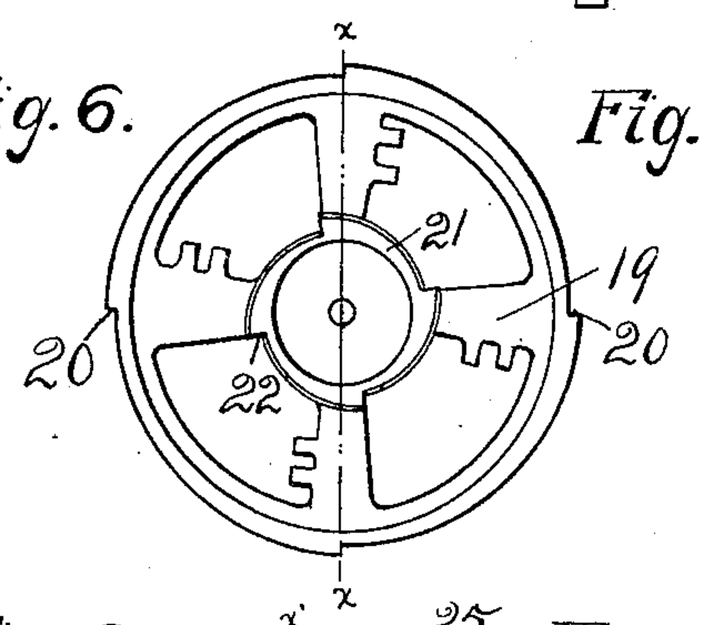


Fig. 7.

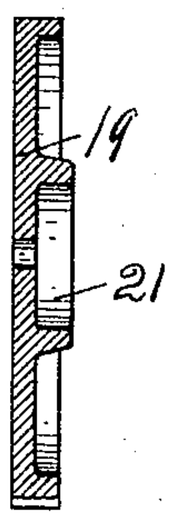


Fig. 8.

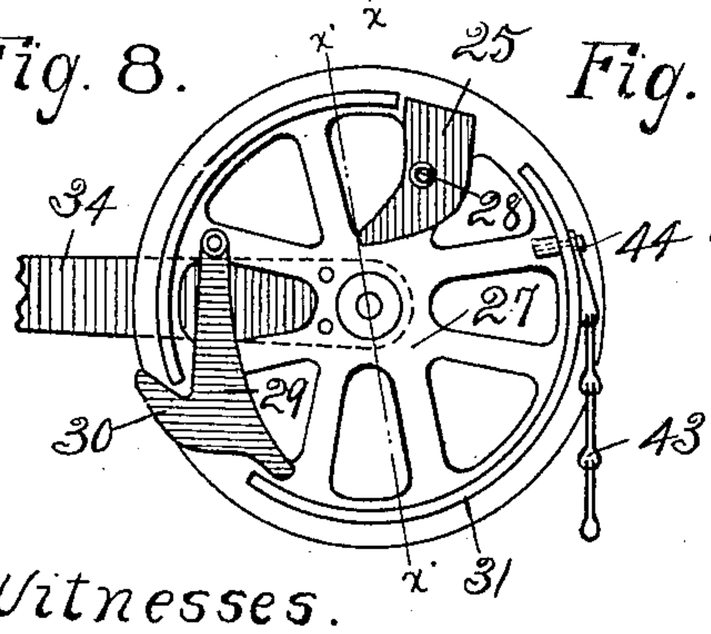


Fig. 9

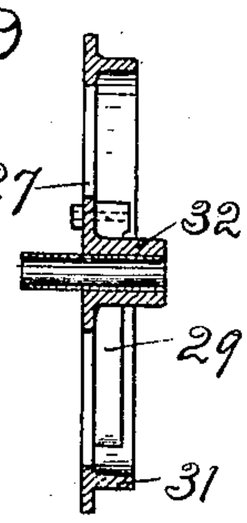
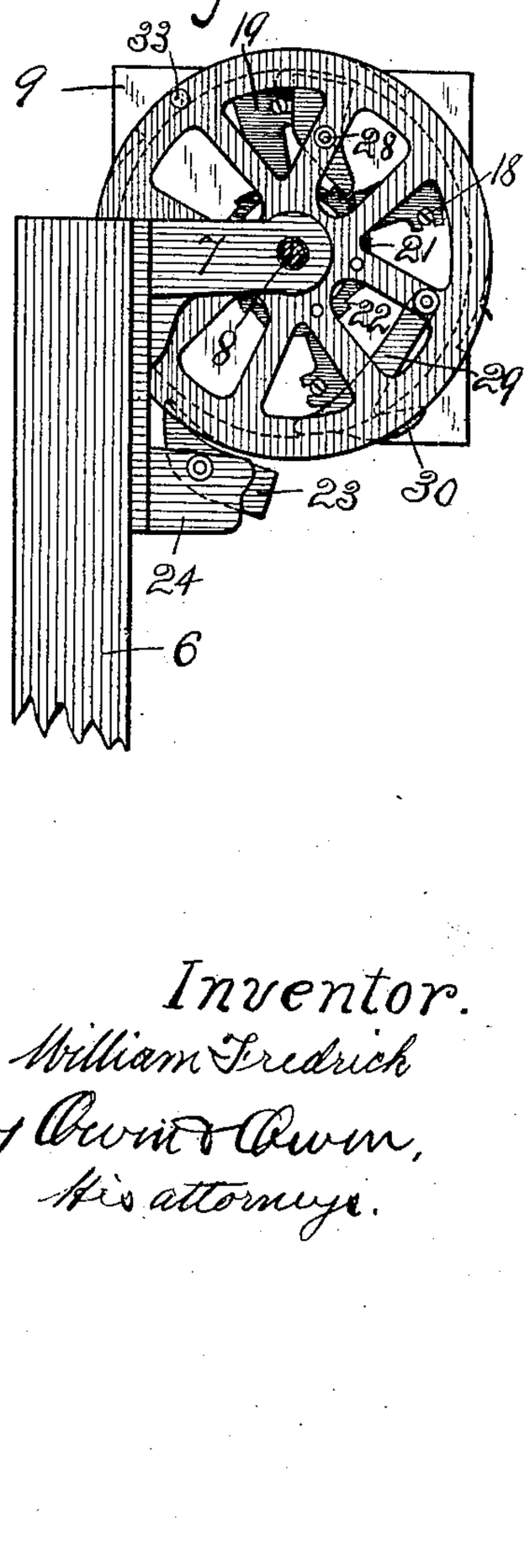


Fig. 10.



Witnesses.

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His attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM FREDRICK, OF CLYDE, OHIO, ASSIGNOR OF ONE-HALF TO HOMER METZGER AND ONE-HALF TO TAYLOR FULLER, OF CLYDE, OHIO.

AUTOMATIC LANTERN-SLIDE-MOVING DEVICE.

No. 865,373. Specification of Letters Patent. Patented Sept. 10, 1907.

Application filed October 2, 1906. Serial No. 337,141.

To all whom it may concern:

Be it known that I, WILLIAM FREDRICK, a citizen of the United States, and a resident of Clyde, in the county of Sandusky and State of Ohio, have invented a certain new and useful Automatic Lantern-Slide-Moving Device; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to apparatus for use in conjunction with stereopticon or like lanterns by means of which a lecturer or other person may, either at a distance from or close by the lantern, cause a series of views to be automatically and successively moved to and away from the optical portion thereof in proper order and at such times as may be appropriate to the context and character of his discourse, thus placing the display of the views directly under the control of the lecturer and dispensing with the usual attendant.

The primary object of my invention is to provide a simplified and cheapened apparatus of this class, which is easy and efficient in its operation and equipped with improved opaque means for automatically curtaining or shuttering the optical portion of the lantern during a movement of the views to and from the same, whereby to avoid the unpleasant sliding of the pictures across the field in view of the audience.

The operation, construction and arrangement of the parts of my invention are fully described in the following specification and one form thereof illustrated in the accompanying drawings, in which,—

Figure 1 is a top plan view of a lantern embodying the features of my invention. Fig. 2 is a side elevation thereof. Fig. 3 is a rear elevation thereof with a portion of the views broken away. Fig. 4 is an enlarged cross-section on the dotted line *v v* in Fig. 3. Fig. 5 is an enlarged detail of a portion of two connected views showing their manner of connection. Figs. 6 and 7 are side and sectional views of the ratchet-wheel on the reel or drum carrying the views. Figs. 8 and 9 are similar views of the wheel coöperating with said ratchet-wheel. Fig. 10 is an enlarged side elevation of the reel with a portion of its supporting frame, the operating handles being removed, and Fig. 11 is a sectional view of the ratchet and pawl wheels in assembled position.

Referring to the drawings, 1 designates the lantern and 2 the objective of a stereopticon apparatus, which parts are secured to or adjacent opposite edges of a base 3. This base is preferably hinged to a lower plate or supporting member 4 relative to which it is retained in proper adjustment by adjusting screws 5.

Rising from the base 3 intermediate the lantern and objective are the spaced parallel uprights or standards 6 6, each of which carries at its upper end a bearing-bracket 7. Journaled in these brackets is a shaft 8 to which is fixed a drum or reel 9 having a square, octagon or other suitably shaped perimeter to adapt it to support and impart the requisite movement to the series of flexibly connected views 10 as they are successively fed to the optical parts. These views are carried by a box or receptacle 11, which is removably supported in proper position beneath the drum or reel 9 by the standard 12 rising from the base 3 and the plate or bracket 13 secured to the standards or uprights 6 6, and are passed up over the drum or reel and hang loosely from the opposite side thereof between the standards or uprights 6 6. The sides of the drum or reel are substantially the size of the views 10, so that as it is turned each side thereof will coact with a separate view and cause them to be either delivered from or returned to the box according to the direction of turning of the drum or reel. The views 10 operate within gained portions 14 of the standards and are prevented from an outward movement relative thereto by a plate 15, which is secured to and connects the rear sides of said standards, as shown in Figs. 3 and 4. Provided in this plate in proper position relative to the lantern 1 and objective 2 is an opening 16, which is of suitable size to accommodate the picture on a view plate 10 positioned in advance thereof. As the views move downwardly from the optical parts of the apparatus they pass through alining slots 17 in the two base members 3 and 4, and fold one upon the other on the floor or other object placed in their path of movement.

Fixed to one end of the drum or reel 9 by screws 18, or in any other suitable manner, is a ratchet-wheel 19, which has its periphery formed with ratchet-teeth 20, and is provided adjacent its center with the annular concentric flange 21 having the ratchet-teeth 22 formed thereon, as best shown in Fig. 6. The teeth 20 of the wheel are engaged by a pawl 23 carried by an arm 24 on the contiguous bearing-bracket 7, said pawl having its free end weighted to cause its opposite end to normally coact with the toothed periphery of said wheel, while the teeth 22 thereon are intended to be engaged by a pawl 25 carried by a wheel 27, which is loosely mounted on the shaft 8 in contiguous position to the ratchet-wheel 19 for rotatable movement relative thereto. The pawl 25 is carried at the upper portion of its wheel, as at 28, and is normally maintained out of engagement with its coöperating teeth 22 due to its free end being weighted. After the pawl has passed the center of gravity of the wheel 27 by a rotation of said wheel in the direction of engagement of the pawl, it is caused to coact with the next tooth 22 by reason of its gravity movement relative to the wheel 27. The wheel 27 also carries a pivoted finger 29 having a weighted part 30

projecting therefrom in position to ride upon the point of the pawl 23 at a predetermined point in the movement of the wheel 27 so as to counterbalance the weighted end of said pawl and effect its release from the engaged tooth 20. As the frictional resistance of the tooth 20 with the pawl 23 might prevent the gravity of the finger 29 from releasing the pawl, the pawl 25 and coöperating teeth 22 are so arranged that the pawl 25 engages one of said teeth just prior to the limit of backward or releasing movement of the wheel 27, thus imparting a sufficient movement to the wheel 19 and attached drum 9 to relieve the pawl 23 of its frictional resistance with the coacting tooth 20. The engagement of the pawl 25 and teeth 22 continues until the drum, actuated by the weight of the suspended views, has been given a quarter turn forward, or until the pawl 23 coacts with the next tooth 20, thus causing the movement of the drum to be retarded to that of the manually controlled wheel 27 and obviating the sudden or jerking movement of the views which would occur if no restriction were placed on their released movement. The finger 29 has its outward movement limited by its free end engaging a segmental flange 31 on the wheel 27, as shown.

The wheel 27 is provided on its inner side with a hub 32, which is of sufficient length to abut the contiguous face of the ratchet-wheel and maintain the major parts of said wheels out of contact. A pin or stop 33 is provided on the outer face of the wheel 27 and is intended to coact with the upper end of the contiguous upright 6 to limit the return movement of the wheel 27. A crank-arm 34 is secured to the wheel 27 to facilitate a turning thereof, and a crank-arm 35 on the end of the shaft 8 enables the drum or reel 9 to be easily turned to the right by the operator to effect a replacing of the views in the box or receptacle 11 after they have been displayed.

In order to avoid the unpleasant effect on the audience due to the movement of views on the screen during a changing thereof, I provide a shutter 36, which is automatically thrown in advance of the opening 16 in the plate 15 during a changing of the views. This shutter has its lower edge pivoted, as at 37, to the uprights or standards 6 6 and is provided at one end with the outwardly projecting finger 38. Reciprocally mounted within a longitudinal guideway 39 in the standard 6 contiguous to the finger 38 and operating through an alining opening 40 in the base members 3 and 4 is a rod or trip-member 41, which carries the two pins 42 for coacting with and effecting a raising or lowering of the shutter as the rod or member 41 is raised or lowered. The rod 41 is suspended by a chain or flexible band 43 from the segmental flange 31 on the wheel 27 to which it is secured as at 44, so that an oscillation of such wheel will effect a reciprocation of said rod. The pins 42 are so spaced that the shutter is raised as the rod reaches its limit of upward movement and is not lowered until the next view has been lowered in position. The shutter when closed is retained out of engagement with the moving plates by a stop pin 45.

The view plates 10 each have their side edges bound by U-shaped metal strips 46, which are firmly pressed thereon and have their ends slightly extended beyond the ends of the plates, as shown in Fig. 5, and perforated to receive a connecting link or member 47. These links or connecting members are formed in U-shape from spring-metal or wire and have their loop portions pivotally connecting the pairs of strips of a plate at one end thereof and their terminals bent inwardly to project within the apertures in the contiguous ends of the strips on the next plate. The links being made of spring metal are capable of having their ends easily and quickly disconnected from a plate by simply taking hold of the same and drawing them outwardly until their bent terminals are released from the ends of the attached strips, thus providing a simple and convenient means of removably connecting the plates together. The provision of a single-piece link for connecting the ends of the plates is also important, as the side edges of a plate are prevented from opposite lateral movement relative to the attached plate upon which it is folding. It has been found by the employment of independent links at each side edge of two connected plates that the links have a tendency to fold in opposite directions and their use is not therefore practical in this connection. The binding strips 46 in addition to serving as means for engaging the links 47 also tend to protect the plates from having contact whereby to wear the paper binding usually employed at the ends thereof to prevent dust from collecting between the two glasses of a plate.

In the operation of my invention the end of the series of views containing the first pictures of the set is passed over the drum or reel and suspended therefrom a sufficient distance for the first view to be shown to be positioned one picture length above the opening 16 in the plate 15 carried by the standards 6 6. When the operator is ready to display this picture he gives the crank-arm 34 a quarter turn to the right, or until it is stopped by the coaction of the lower pin 42 of the shutter-rod 41 with the finger 38 after said shutter has been raised thereby to close the opening 16. On the lowering movement of the crank-arm the pawl 25 escapes the first contiguous tooth 22 of the ratchet-wheel 19, but is thrown, by the gravity movement of its free end, into position to engage the next tooth 22 of the series, which it engages after the gravity finger 29 has moved into engagement with the point of the pawl 23 and just prior to the limit of releasing movement of the crank-arm and wheel 27, thus effecting a slight backward rotary movement of the drum 9 and attached ratchet-wheel 19 to release the frictional resistance of the engaged tooth 20 with the pawl 23 so as to permit the gravity-finger 29 to throw said pawl 23 out of engagement with its tooth. This being done the weight of the suspended forward end of the series of views causes the drum 9 to turn to the left until the next tooth 20 on the attached ratchet-wheel engages the pawl 23, which is sufficient to permit the drum to have a quarter rotation and to move the picture to be displayed in advance of the opening 16 in the plate 15. The continued coaction of the pawl 25 with one of the teeth 22 until the pawl 23 has engaged the next succeeding tooth 20 causes the movement of the drum to be retarded to that of the wheel 27, which latter is under the control of the operator. The wheel 27 is automatically returned to its normal position due both to the engagement of one of the teeth 22 with the pawl 25 carried thereby and the weight of the suspended shutter rod 41. The shutter 36, which remains closed during the movement of the views, is opened by the upper pin 42 on the rod 41 coacting with the finger 38 thereon just prior to the limit of lowering movement of

said rod. This operation is repeated for each view of the series. When the series of views have all been displayed the operator replaces them in the box or receptacle 11 by simply turning the crank-arm 35 to the right with one hand and guiding the views with the other hand so that they are uniformly folded together in said box or receptacle. The box may now be removed and another box of views secured in place if it is desired to continue the display. It is thus apparent that to change the views it is only necessary for the operator to turn the crank 34 to the right, the remainder of the operation being automatically accomplished by the mechanism and gravity of the suspended views; that the views when returned to the receiving box are then in shape for storage or moving, and that the several parts of the apparatus may be easily disassembled to enable them to be packed in compact form for the purpose of carrying from one place to another. It is also apparent that by flexibly connecting the several views of a series as shown, or in any other convenient manner, they are always in order so that it is not necessary for the operator to examine each one to ascertain if it is the one he desires to show or to see that it is properly placed in the lantern, thus preventing a distraction of the lecturer's attention from his discourse.

While I have shown and described but one construction of my invention, I desire it to be understood that I do not wish to restrict myself to such construction, for obvious modifications will occur to a person skilled in the art.

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

1. In combination, a reel, a series of connected views associated therewith, a ratchet-wheel fixed to the reel, means normally coacting with the ratchet-wheel to prevent an unwinding movement of the reel, and means movable relative to said wheel to effect a release of said first means and to retard the forward movement of the reel.

2. In combination, a reel, a series of connected views associated therewith, a toothed member fixed to the reel, means coöperating with said member to normally prevent a rotation of the reel in one direction, and means rotatable relative to said member to effect a release of said first means from the toothed member and to retard the released movement of the reel.

3. In combination, a reel, a series of connected views coacting therewith, a member fixed to the reel, means cooperating with the member to normally prevent a rotation of the reel in one direction, a shutter, and means having a common axis with and rotatable relative to said member to effect a release of said first means from the member and an operation of the shutter.

4. In combination, a reel, a series of connected views associated with the reel, a member coöperating with the reel to normally prevent a rotation thereof in one direction, a shutter, an element movable relative to the reel for effecting a release of said member and an operation of the shutter, said reel being retarded in its movement by said element, substantially as described.

5. In combination, a reel, a series of connected views associated with the reel, a member coöperating with the reel to normally prevent a rotation thereof in one direction, a shutter, an element having a common axis with and rotatable relative to the reel to effect a release of the member whereby to permit a movement of the reel, and connection between the shutter and said element to impart a movement from one to the other.

6. In combination, a reel a series of connected views associated with the reel, a toothed member fixed to the reel, a pawl coöperating with said member to normally prevent a rotation of the reel in one direction, an element having a common axis with and rotatable relative to the reel, and means carried by said element to effect a release of the pawl at a predetermined point in the rotation of the element whereby to permit a movement of the reel.

7. In combination, a reel, a series of connected views associated with the reel, a toothed member fixed to the reel, a pawl coöperating therewith to normally prevent a rotation of the reel in one direction, a wheel rotatable relative to said member, means carried by the wheel to effect a release of the pawl at a predetermined point in the rotation of the wheel, and means carried by the wheel for retarding the movement of the reel to that of the wheel when said pawl is released, substantially as described.

8. The combination with a picture display apparatus, of a rotatable member, a series of flexibly connected views associated therewith, a shutter, an element having a common axis with and rotatable relative to said member and having connection both with it and with the shutter for controlling their movements.

9. In combination, a reel, a series of flexibly connected views, a toothed member fixed to the reel, a pawl cooperating with said member to normally prevent a movement thereof in one direction, a rotatable member movable relative to the toothed member, a weighted element carried by said rotatable member to effect an automatic release of the pawl at a predetermined point in the rotation of said latter member, and a weighted pawl carried by the rotatable member for coöperating with the toothed member to retard its movement to that of the rotatable member when the first mentioned pawl is released, substantially as described.

10. In an apparatus of the class described, a rotatable member having a ratchet-wheel at one end thereof, a pawl for coöperating with said wheel to limit its rotation in one direction, an element rotatable relative to said wheel and carrying gravity means for effecting a release of said pawl at a predetermined point in the rotation of said element and a gravity controlled pawl for engaging the ratchet-wheel to effect a slight movement thereof in the opposite direction to the engagement of the first mentioned pawl, and a series of flexibly connected views movable by said member through the apparatus.

11. In combination a plurality of views, metal binding strips secured to the side edges of the views and having their ends extended beyond the ends of the views and perforated, and links flexibly connecting the ends of the views and each comprising a U-shaped spring-metal member having its loop pivotally engaging the ends of the strips at one end of a view and having its terminals bent inwardly and in pivotal engagement with the ends of the contiguous strips at one end of another view.

12. In combination a pair of view plates, and a substantially U-shaped spring-metal member flexibly connecting an end of one to an end of the other plate, said member being removable therefrom by an outward withdrawal of its legs.

13. In combination, a pair of view-plates, and a single-piece link member removably connecting the side edges thereof in spaced relation.

14. The combination with a pair of view plates, of a flexible single-piece link member pivotally engaged to the end of one plate and having its ends bent to form cooperating parts for pivotally engaging an end of the other plate.

In testimony whereof I have hereunto signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM FREDRICK.

Witnesses:
C. W. Owen,
Powell Schreiber.