

E. VAN ALTENA.
 PICTURE SLIDE PROJECTION APPARATUS.
 APPLICATION FILED AUG. 26, 1919.

1,428,347.

Patented Sept. 5, 1922.

4 SHEETS—SHEET 1.

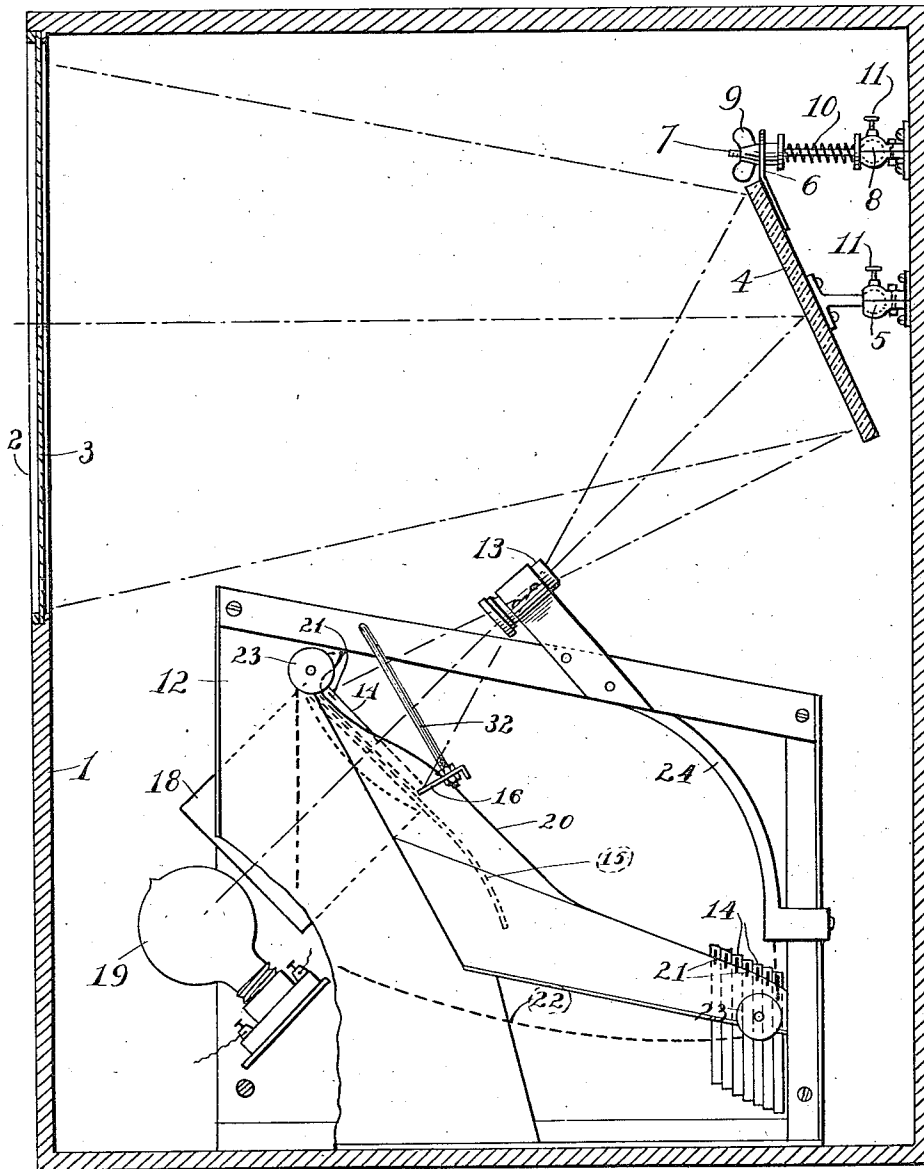


Fig. 1.

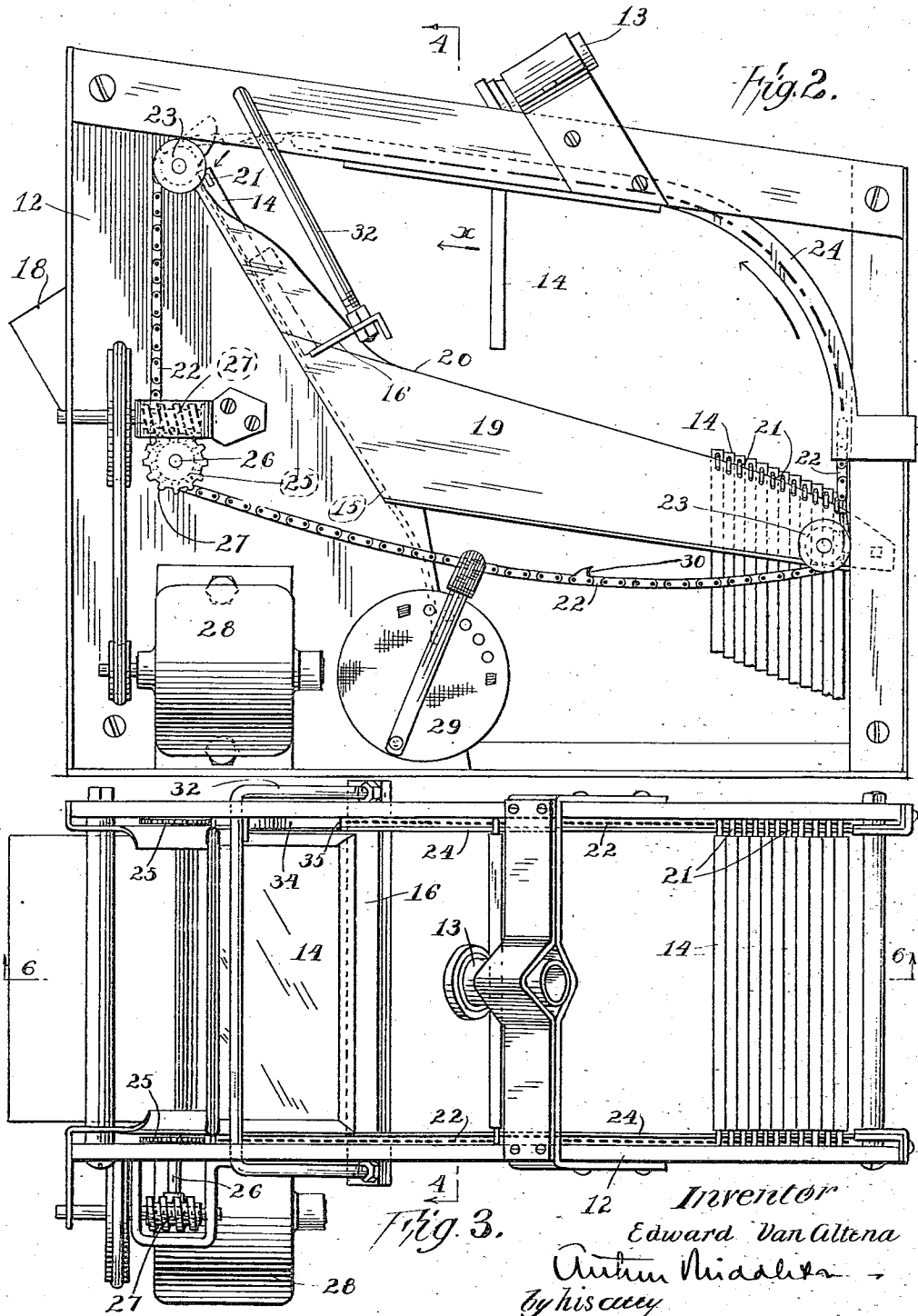
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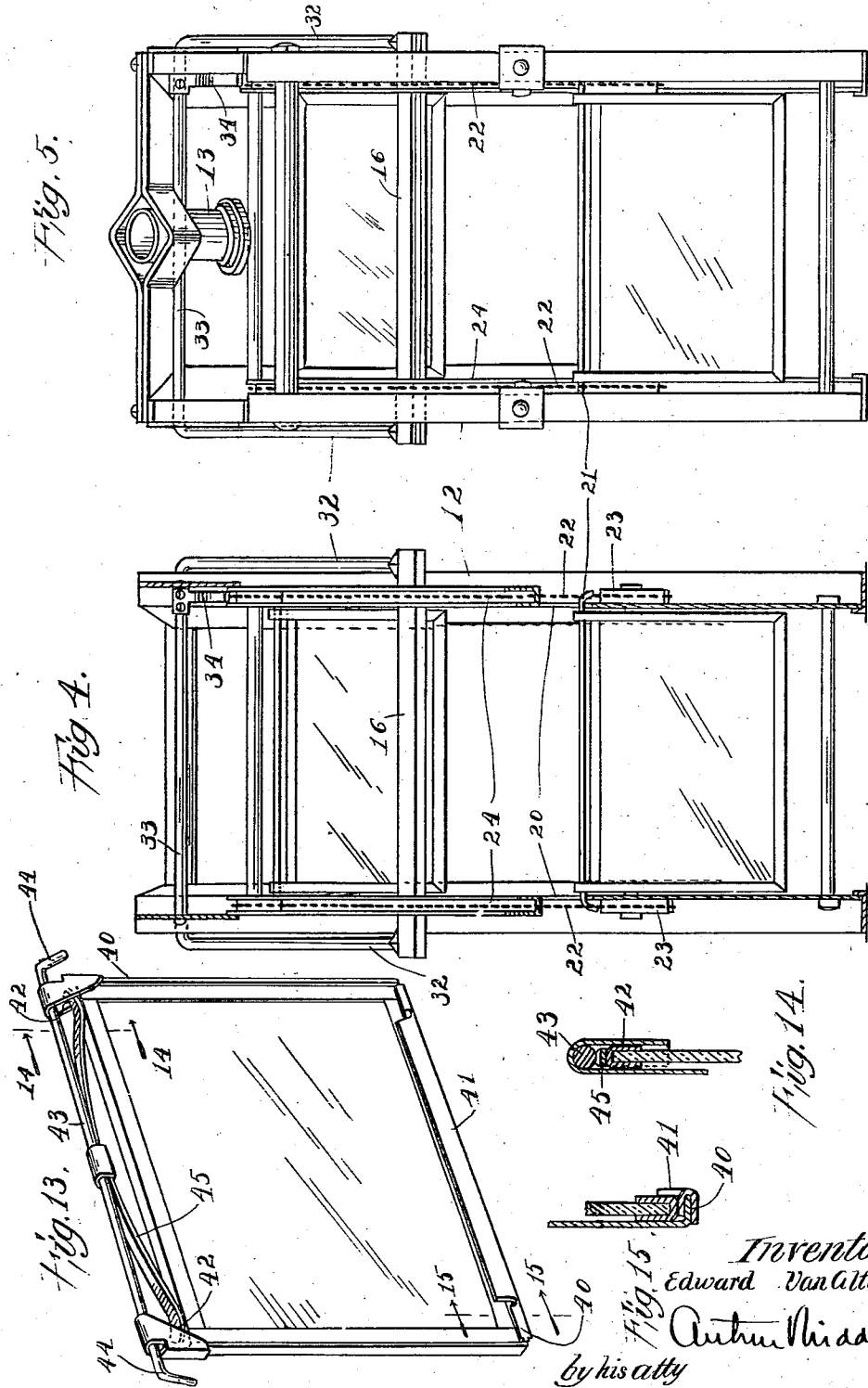


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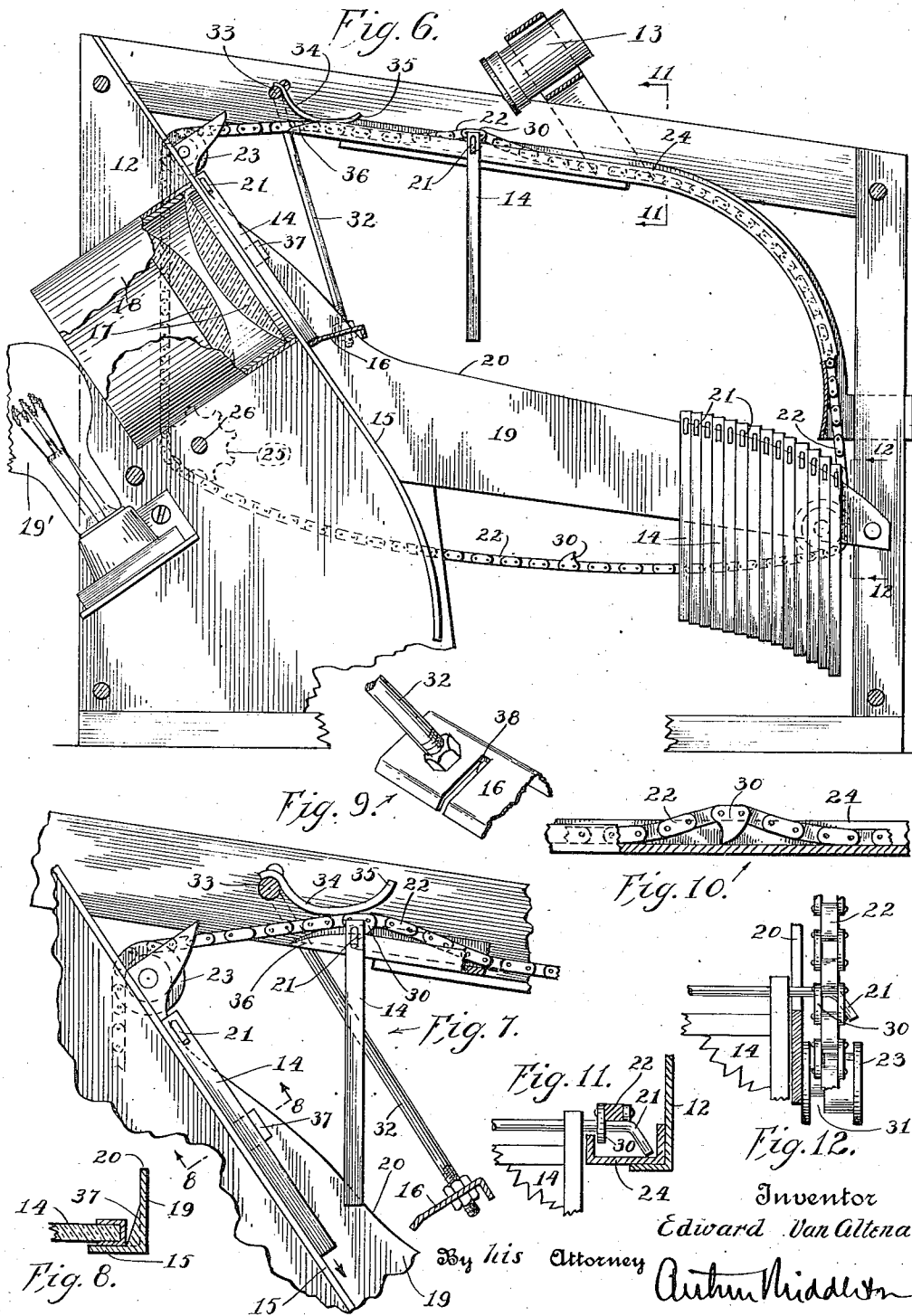
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

EDWARD VAN ALTENA, OF NEW YORK, N. Y.

PICTURE-SLIDE-PROJECTION APPARATUS.

Application filed August 26, 1919. Serial No. 320,062.

To all whom it may concern:

Be it known that I, EDWARD VAN ALTENA, a citizen of the United States, residing at New York, N. Y., have invented new and useful Improvements in Picture-Slide-Projection Apparatus, of which the following is a specification.

This invention relates to improvements in an automatically operated picture-slide display apparatus, wherein a single slide is positioned upon a display point, and retained in position until successive slides are brought to the display point to replace the slide so positioned.

An object of this invention is to provide a device of the character described which is provided with adjusting means to assure perfect alignment and perpendicular projection of the light rays upon the display screen, regardless of the angle of the slide when in projecting position.

A further object is to provide an apparatus as described wherein pick-up, feeding and releasing means are provided which are positive in action and operate with a minimum amount of wear to the parts.

Another object is to provide, in an apparatus as described, simple means for retaining a slide in an inclined display position whence it is discharged by an overhead tripping action to move, by gravity, to the magazine section of the apparatus.

A further object is to provide, in an apparatus as described, positive means for simultaneously centering and depositing a slide upon the display shelf at the instant of contact therewith.

These objects, as well as others which will be brought out in the following description and set forth in the appended claims are attained by that embodiment of my invention illustrated in the accompanying drawings, in which,

Figure 1 is a section through a cabinet containing a complete apparatus, and shows a portion broken away, for sake of better illustration;

Figure 2 is a side view of the operating mechanism removed from the cabinet and shows a slide in place at the display point and the following slide moving toward that point;

Figure 3 is a top or plan view of the part shown in Figure 2.

Figure 4 is a section taken on line 4—4 of

Figures 2 and 3 and looking in the direction indicated by arrow heads;

Figure 5 is an end elevation looking in the same direction;

Figure 6 is a section taken on line 6—6 in Figure 3 and looking in the direction indicated by arrow heads.

Figure 7 is an enlarged detail view and shows the operation of the overhead tripping mechanism to discharge a slide at the display point and just prior to the time of release from the feeding chain, of a following slide;

Figure 8 is a sectional detail view of the slide centering element and is taken on the line 8—8 in Figure 7;

Figure 9 is a detail view, in perspective, of a retaining shelf forming a part of the releasing mechanism;

Figure 10 is an enlarged view of a part of the feeding chain showing the lifting and conveying finger formed thereon;

Figure 11 is a sectional view taken on line 11—11 of Figure 6;

Figure 12 is an elevation and section taken on line 12—12 of Figure 6.

Figure 13 is a perspective view of an improved form of plate or slide holder used in connection with this machine;

Figure 14 is an enlarged sectional view taken on line 14—14 of Figure 13 and

Figure 15 is an enlarged sectional view taken on the line 15—15 of Figure 13.

Referring in detail to the parts; 1 designates a cabinet having an aperture 2 which is closed by means of any suitable material to form a picture screen, 3. Concentrically arranged with this screen and upon the opposite wall of the cabinet is an adjustably mounted reflecting disk, plate, or mirror 4, which disk is horizontally pivoted to the wall of the cabinet by the ball hinge joint, 5. The disk is further provided with a perforated projecting lip, 6, which engages over the end of a threaded bar, 7, which is in turn pivotally attached to the wall of the cabinet as at 8.

A thumb nut, 9, engaging upon the threaded portion of the bar, 7, acts to limit the outward movement of lip, 6, upon the disk, and a spring, 10, normally keeps the lip in its outermost position against the thumb nut. Obviously, a turning movement of the thumb nut will cause the disk to oscillate about its pivotal connection to

the wall of the cabinet. Set screws, 11, may be employed to lock the disk against accidental displacement.

A frame, 12, is suitably mounted at the base of the cabinet and carries upon it, in proper angular alignment with the screen and reflecting disk, a projecting lens, 13, which is also in axial alignment with the inclined display point of the apparatus, indicated by the position of a slide, 14, resting upon inclined ledges, 15, and retained in position thereon by means of a retaining ledge or shelf, 16.

In axial alignment with the display point and projecting lens is a condensing lens, 17, held in place in close proximity to the display point by means of a housing, 18, which is suitably mounted between the sides of the frame—any suitable lighting means, as an electric bulb, 19, is suitably positioned and held between the sides of the frame in proper alignment with the condensing lens.

The hereinbefore mentioned inclined ledges, 15, form a part of guideways, 19, which are secured to the side of the frame, and are formed with upper inclined surfaces, 20, along and upon which the picture slides move and are suspended. The slides are encased in suitable metal bindings, having projecting arms, 21, formed thereon, which act as a means for suspending the slides from the inclined upper surface of the guideways.

Endless chains, 22, are carried about drums, 23, and over and along channeled runways, 24. The chains engage sprockets 25, mounted upon a shaft, 26, which shaft is in turn rotated, through the medium of the worm, 27, by any suitable driving power, preferably by an electric motor, 28.

These chains are merely representative of any conveying means which may be provided for the slides.

The current supply to the motor is controlled by means of the variable resistance unit, 29, thus providing a means for controlling the speed of the chain movement.

One or more lifting fingers, 30, may be formed upon the chains and are adapted to contact with the projecting arms formed upon the slides to carry them to the display point. The drums, 23, are suitably formed with channels or grooves, 31, to permit the passage of the finger.

The aforesaid retaining shelf, 16, is secured to oscillating arms, 32, which are pivotally connected to the sides of the frame as at 33. A trigger, 34, having an upwardly turned end, 35, is secured to one of the oscillating arms in such a manner that it rests normally upon the chain in the channeled runway near the end, 36, of the same.

Wedge shaped guiding members, 37, are

formed upon the upper sides of the guideways, 19, and act as a centering means to properly seat the slide, at the moment of contact at the display point.

Slots, 38, formed in the retaining shelf permit same to clear the guideways and also act as a stopping means in the downward movement of the retaining shelf.

Having thus described the construction of the device, an explanation of operation thereof follows:

Assuming that a number of slides have been suspended upon the guideways at the magazine end as clearly shown in the several views and the chains are in operation, the first set of fingers after passing the lower drums engage the projecting arms of the first suspended slide, raises it and carries it along with it so that the arms of the slide ride upon the flange of the runway holding the chain, at the point of engagement with the arms on the slide, in the raised position shown.

This raised portion subsequently coming in contact with the trigger connected with the retaining shelf, lifts it and causes the shelf to swing away from the display point thereby releasing the slide held in the display position. The slide thus released, drops or slides by gravity; the lower edge of the slide moving along the inclined ledges and the upper extending arms of the slide guiding it along the upper inclined surfaces of the guideways to the magazine section where it moves along step by step until in a position to be again taken up by the fingers on the chains.

Directly after the release of the slide occupying the display position the trigger resumes its normal position, causing the retaining shelf to do likewise, and immediately following this movement the next slide is dropped from the chain in such a manner that it strikes the wedge shaped centering surfaces full and evenly, the wedges acting as a centering and placing means.

The slide so positioned remains in place until the next slide comes up. The operation just described is then repeated and continued indefinitely or as long as the chain is in motion.

The interval of display may be determined by the number of fingers upon the chains or by the speed control.

The adjustment of the reflecting disk, to insure a projection, from an inclined slide, perpendicular to the screen, is effected by means of the thumb nut, in a movement hereinbefore described. This adjustment permits maintaining the central plane of the projected light reflected from the mirror perpendicular to the screen. The slightest variation of this plane from the perpendicular will distort the image and the operation of the machine will be unsatisfactory. I have found

in practice that many circumstances will act to derange this plane from the perpendicular, due to such things as jarring of the apparatus, its expansion and contraction due to heat and so forth, so that this adjustment is a very important part of an apparatus which projects through an inclined slide at the display point. Further, by this adjustment, the screen member can be removed and the image thrown upon a screen suspended where desired, for this adjustment will enable the reflected beam to be maintained perpendicular to the screen.

A metal detachable slide holder with no positive connection at any time with any part of the machine, as illustrated in Figures 13, 14 and 15, may be employed in connection with this machine. In this form of holder, a metal frame, having side members, 40, is provided, the frame having an upper and lower recessed portion, 41 and 42 respectively. To the upper recessed portion a suspending bar, 43, having extended ends, 44, is attached while a flat depending spring, 45, is secured to the suspending bar. The outer free ends of the depending spring engage in the recessed portions 42, and are adapted to engage against the upper edge of a slide when same is contained in the frame to hold it against dislodgment.

It is obvious that various modifications may be embodied in this invention without departing from the spirit of the same, it will therefore be understood that the claims are not limited to the particular construction shown. As an example, it may be stated that the conveying chains and co-acting guides may be omitted and lever arms or wheels used in their place to raise the slides from the reservoir to a point ready to drop into the display position. Also the shelf could possibly be made stationary if other means were provided to remove a slide therefrom. All this is within the scope of the appended claims, for I have only illustrated that embodiment of my invention which is the best form in my estimation.

I lay great emphasis upon the various novel features, or their equivalents, brought out in the claims being operable in connection with a picture projection apparatus instead of with an apparatus where the picture is reflected or illuminated for the difficulties to be overcome in adapting such feature to a projection apparatus have been well-nigh insuperable.

What is claimed:

1. In combination a plurality of picture slides, a frame having guideways engaged by the upper portions of the slides, the portion of said guideways at the display point extending at an inclination to hold the slide in an inclined position, a shelf movably mounted at the lower part of said inclined guideways and extending across the same to

support the slides singly at the display point, and an overhead trigger actuated means said shelf being moved by the overhead trigger actuated means during the oncoming movement of the slide thereby discharging the used slide from the display point, substantially as described.

2. In combination in a projection apparatus, a plurality of picture slides, a frame having overhead guideways, inclined guideways for the return of the slides from the display point beginning near the upper end of said overhead guideway, the said slides having projections at their upper ends entering said guides to control the movement of the slides and to hang the slides separately in said guideways, elevating means to engage the slides, said elevating means conveying the slides to the display point, a shelf across the inclined guides to hold the slides at the display point, and an overhead trigger actuated means, said shelf being movably mounted to discharge the used slides and being operated by the overhead trigger actuated means during the oncoming movement of the new slide, substantially as described.

3. In combination in a picture projection apparatus, a plurality of picture slides having projections at their upper portions, a frame having inclined guides for holding the slides at the display point in inclined position and for returning the slides to their point of storage, a shelf for supporting the slides at the display point, an overhead trigger actuated means, said shelf being movably mounted and operated by overhead trigger actuated means to discharge the new slides and permit the passage of the oncoming new slide, and a track for receiving the lower portion of the discharge slides while their upper portions are controlled by the projections thereon moving in the return inclined guides, substantially as described.

4. In combination a plurality of picture slides having projections at their upper portions, a frame having overhead guides receiving said projections, inclined guide portions at the display point, overhead trigger actuated means return inclined guides, a shelf extending across the guides said shelf holding the slides at the display point and operable by the overhead trigger actuated means, an elevating chain having an overhead stretch for conveying the slides to the upper part of the inclined guide, substantially as described.

5. In combination in a picture projection apparatus, a plurality of slides having bent projections at their upper ends, a frame having overhead guideways slidably receiving said projections and for conveying the slides to an inclined position at the display point, and return incline guides for slidably directing the slides to their point of storage

by gravity, substantially as described.

6. In combination in a picture slide projection apparatus, a frame having guideways to direct the slides to the display point, slides having projections at their upper ends moving in said guideways by which the upper ends of the slides are controlled, guideways for returning the slides to the point of storage, said projections moving in said guideways during the return movement of the slides, means for guiding the lower portions of the slides in their returning movement, a shelf for holding the slides at the display point, and an overhead trigger actuated means, said shelf being movable and operable by the overhead trigger actuated means to discharge the used slide and permit the new slide to pass above it, substantially as described.

7. In combination in a picture slide projection apparatus, a frame having guideways to direct the slides to the display point, slides having projections at their upper ends moving in said guideways by which the upper ends of the slides are controlled, guideways for returning the slides to the point of storage, said projections moving in said guideways during the return movement of the slides, means for guiding the lower portions of the slides in their returning movement, a shelf for holding the slides at the display point, and an overhead trigger actuated means, said shelf being movable and operable by the overhead trigger actuated means to discharge the used slide and permit the new slide to pass above it, and means for operatively engaging the said trigger actuating means, substantially as described.

8. In a picture slide projection apparatus, slides having projecting arms at their upper ends, a frame having overhead guideways receiving said projections, return inclined guideways for directing the slides to the magazine point, conveying means for conveying slides to the display point along the overhead guideways, a releasing means operable in the overhead guide to deposit slides at the display point, and a centering means formed at and upon the display

point to receive the slide and act upon it after its release from the guideway.

9. In a picture slide projection apparatus, a frame having guideways to direct slides to the display point, means for conveying the slides to the display point, means for retaining the slides at the display point, means for releasing the slides from the conveying means when above the display point whereby they drop onto the retaining means, and means for simultaneously centering the slides as they drop to the display point.

10. A projection apparatus for picture slides having a magazine, a slide display point, means for supporting a slide at its bottom at the display point, conveying means for carrying a slide from the magazine to a point above display position of a slide, and a trigger means for displacing a slide from its support at the display point operated by a slide carried by the conveying means.

11. A projection apparatus for picture slides having a magazine, a slide display point, means for supporting a slide at its bottom at the display point, conveying means for carrying a slide from the rear of the magazine up and toward a point above display position of a slide, and means associated with the slide supporting means depending into the path of an on-coming slide whereby the latter may operate to displace the said slide supporting means from under a slide in display position.

12. The device of the next preceding claim in which the supporting means is pivoted above the top of the conveyer, and the depending means are supported from the pivoted supporting means.

13. In a projection apparatus, a pivotally mounted shelf for supporting a slide in display position, guides for conducting slides away from display point, said shelf being adapted to straddle said guides.

In testimony whereof, I have signed my name to this specification, this 20th day of August, 1919.

EDWARD VAN ALTENA.

Witness:

JOHN T. COGGINS.