W. J. ASHLEY.

AUTOMATIC UNIVERSAL STEREOPTICON.

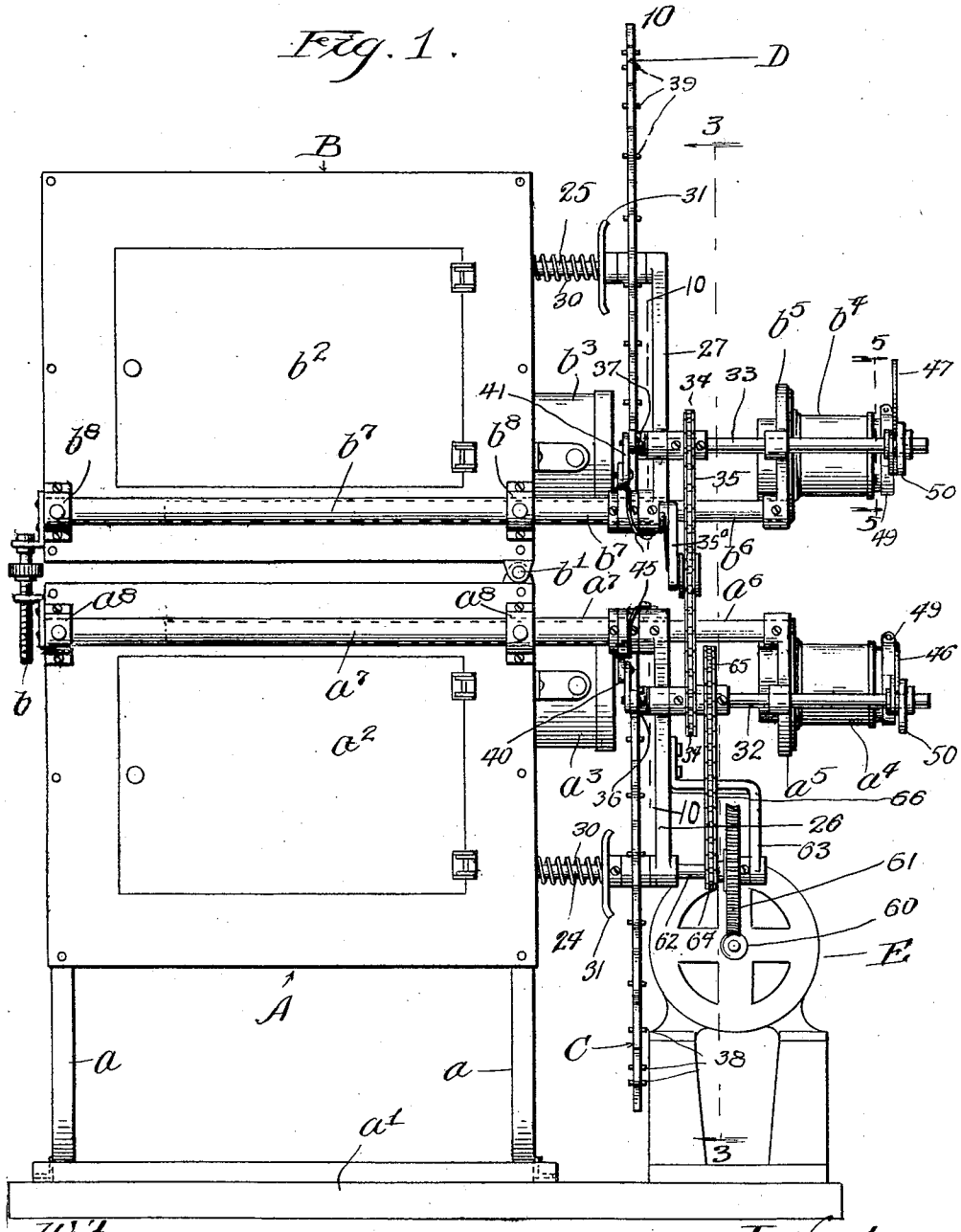
APPLICATION FILED APR. 1, 1914.

1,313,241.

Patented Aug. 19, 1919.

4 SHEETS—SHEET 1.

Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 2.

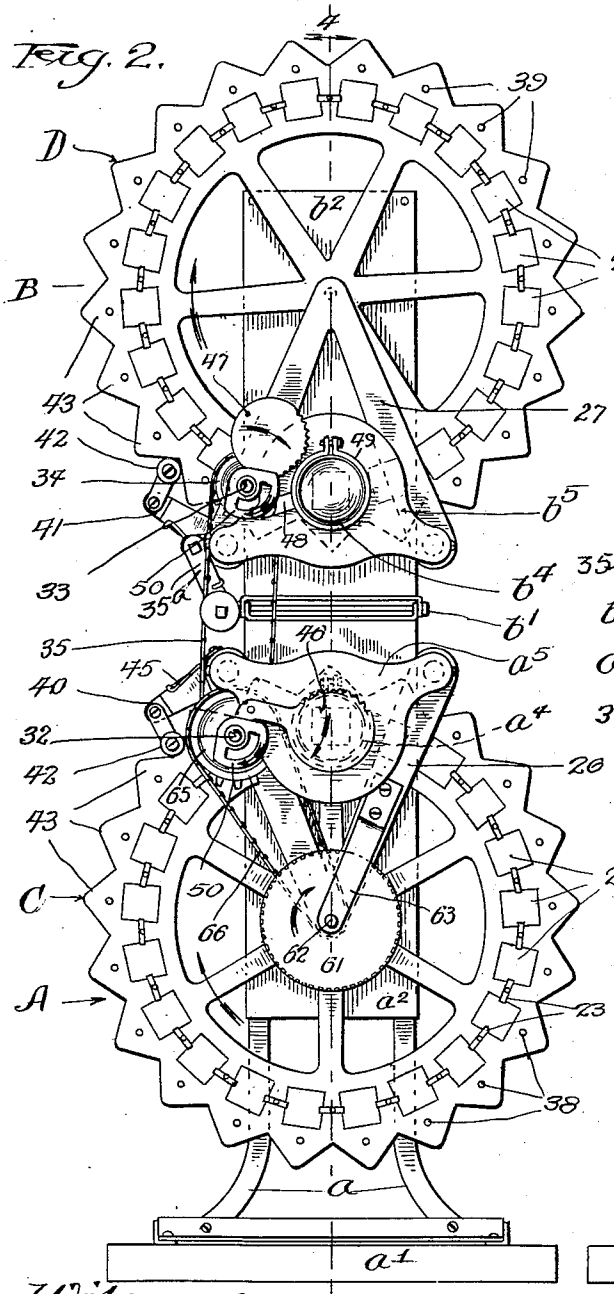
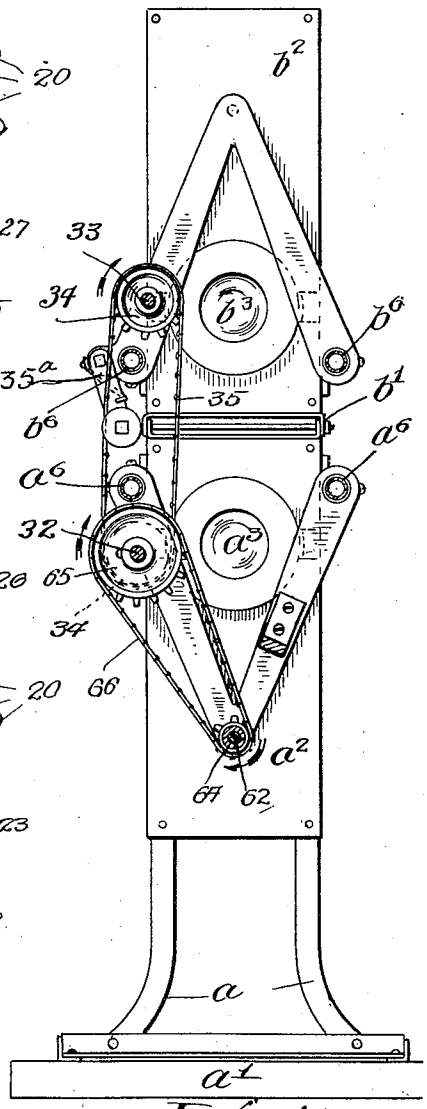


Fig. 3.



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4 SHEETS—SHEET 3.

Fig. 4.

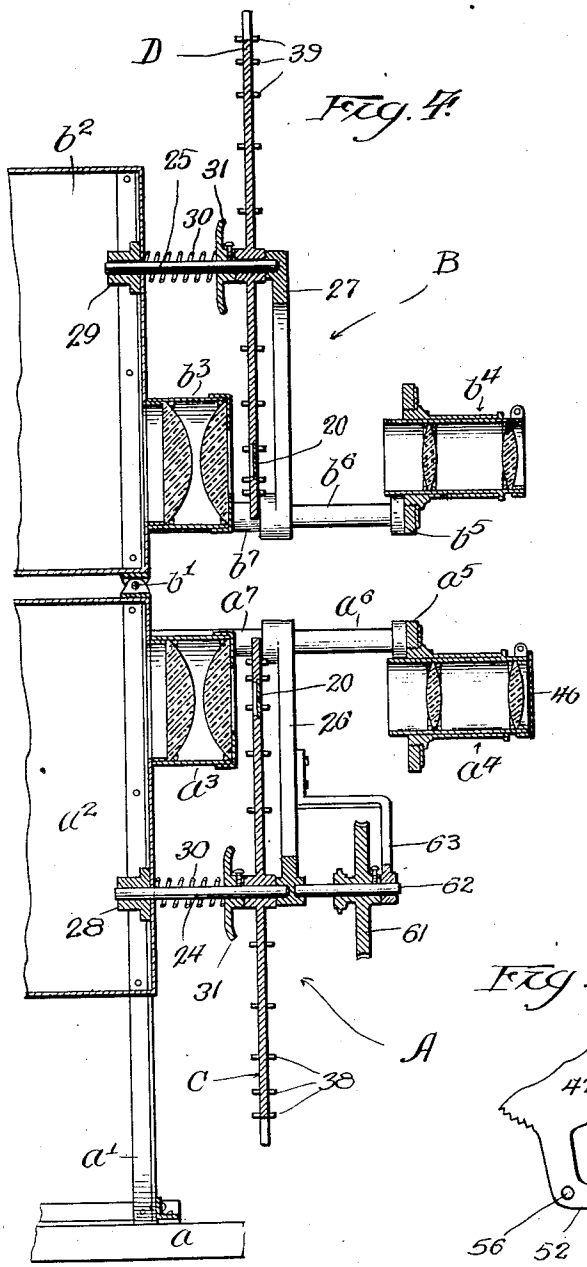


Fig. 5.

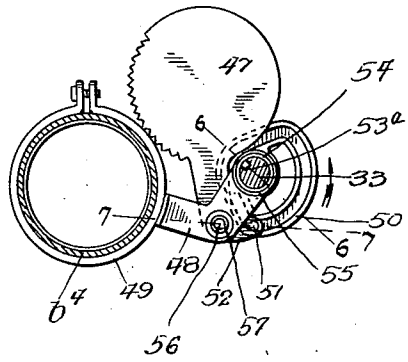


Fig. 6.

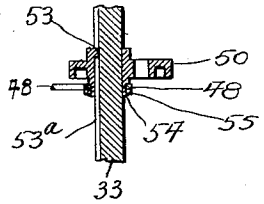


Fig. 7.

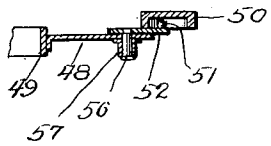
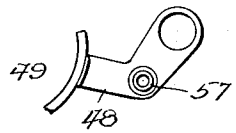


Fig. 8.

Fig. 9.



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APPLICATION FILED APR. 1, 1914.

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Patented Aug. 19, 1919.

4 SHEETS—SHEET 4.

Fig. 10.

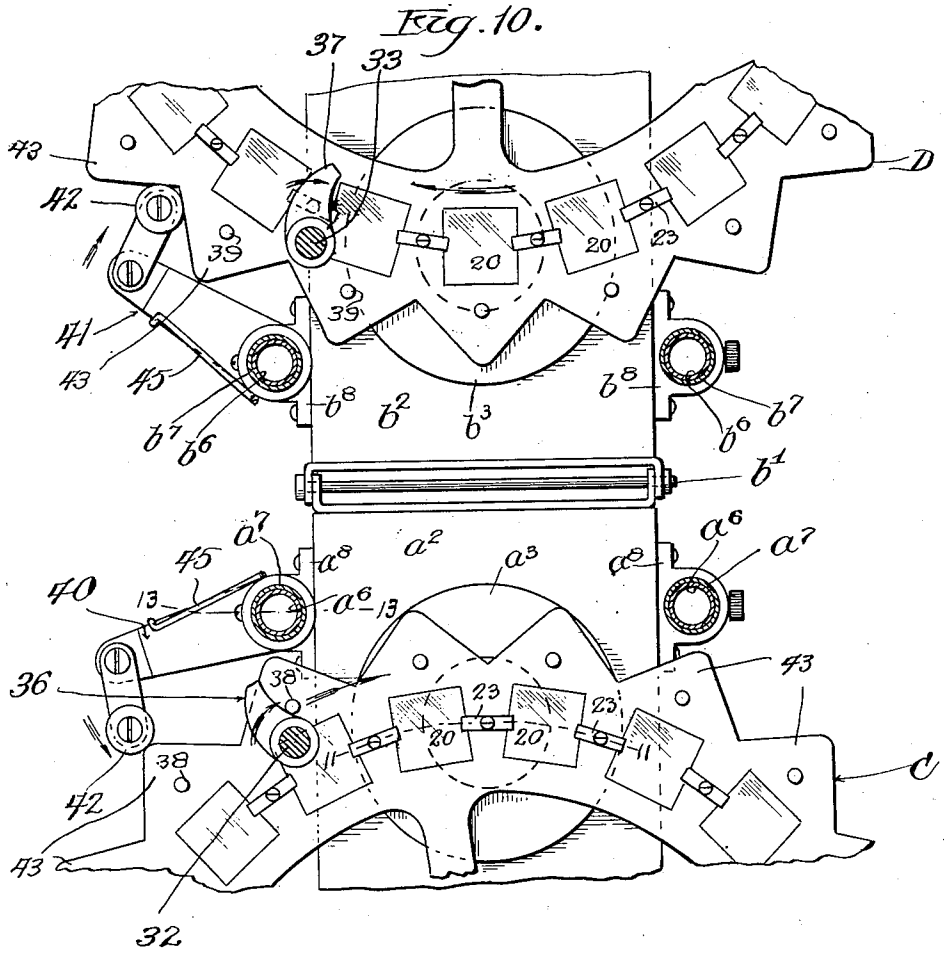


Fig. 11.

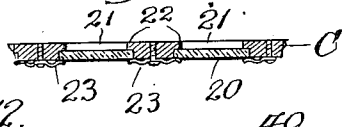


Fig. 12.

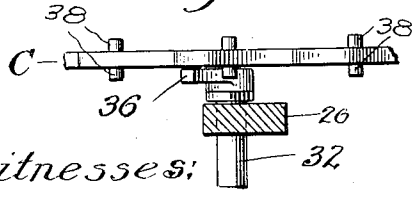
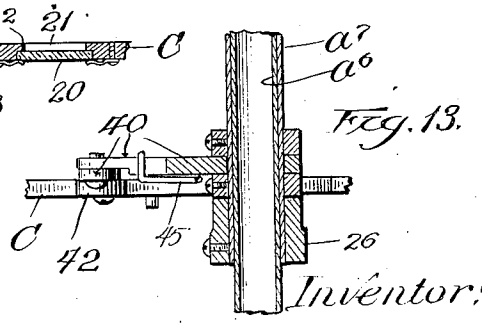


Fig. 13.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC UNIVERSAL STEREOPTICON.

1,313,241. Specification of Letters Patent. **Patented Aug. 19, 1919.**

Application filed April 1, 1914. Serial No. 828,652.

To all whom it may concern:

Be it known that I, WALTER J. ASHLEY, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Automatic Universal Stereopticons, of which the following is declared to be a full, clear, and exact description.

This invention relates to stereopticons and has for its primary object to provide a projecting apparatus adapted to be driven by a motor and arranged to project upon a screen, the subjects appearing on the slides which are held by intermittently actuated slide carrying members, and simultaneously to dissolve one picture into the other so as to avoid abrupt changes between the successive exposures. Another object is to provide a stereopticon, capable of universal usage, that is to say, one which may be employed by lecturers for projecting pictures upon a screen or curtain, or which may be used to display advertisements or other subjects upon a screen, the changes of pictures or advertisements being made automatically and at regular intervals and without any attention on the part of the user of the machine. Other objects and advantages will appear in the course of this specification and with all of these objects and advantages in view, this invention consists in the several novel features hereinafter fully set forth and more definitely pointed out in the claims.

The invention is clearly illustrated in the drawings furnished herewith in which:—

Figure 1 is a side elevation of a stereopticon embodying the preferred form of the present invention; Fig. 2 is a front view thereof, with the motor omitted from the view; Fig. 3 is a vertical cross section taken on line 3—3 of Fig. 1, with the slide carrying members removed from the view; Fig. 4 is a vertical section taken on line 4—4 of Fig. 2; Fig. 5 is a detail face view of the shutter mechanism of the upper apparatus, the lens tube and a certain shaft being shown in cross section, the line of section being taken at 5—5 in Fig. 1; Fig. 6 is a detail section taken on line 6—6 of Fig. 5; Fig. 7 is a detail section taken on the line 7—7 of Fig. 5; Fig. 8 is a fragmental face view of the shutter seen in Fig. 5; Fig. 9 is the face view of the shutter supporting arm seen in Fig. 5; Fig. 10 is a detail front view of fragments of the two slide carrying members, certain mechanism for actuating them and a fragment of the two lamps of the apparatus, certain shafts and lens supporting members being shown in cross section and the line of section being taken at 10—10 in Fig. 1; Fig. 11 is a detail cross section taken on the line 11—11 of Fig. 10; Fig. 12 is a plan of a fragment of the lower slide carrying member and a certain crank arm which actuates the same, and Fig. 13 is a detail section taken on the line 13—13 of Fig. 10.

Referring to said drawings, which illustrate a simple embodiment of the invention, two substantially similar projecting apparatuses will be seen, the one being mounted upon the other and both arranged to throw or project the objects or views on the slide upon a screen or curtain supported in front of the stereopticon at a suitable distance therefrom. Each projecting apparatus is complete by itself, but both are connected together in such manner that while one is projecting a picture upon the screen the other one is bringing into active position a different slide and vice versa. The lower projecting apparatus A, is supported upon legs a, secured upon a base a^1, and the upper projecting apparatus B, is adjustably supported upon the lower apparatus. Each projecting apparatus has a lamp, one lettered a^2, and one b^2, the two being hinged together at b^1, and provided with a screw adjustment mechanism b, at the rear, whereby the rear end of the upper apparatus B, may be tilted more or less for the purpose of focusing the pictures upon the screen.

Both projecting apparatuses have condenser lenses a^3, b^3, supported on the front walls, and objective lenses a^4, b^4, carried by frames a^5, b^5, which are supported by the lamp casings of the apparatuses. The lenses may be of the ordinary and well known type of lenses used in stereopticons and need no particular description so far as this specification is concerned. The lens supporting frames a^5, b^5, have rods a^6, b^6, which are slidably mounted in tubular supports a^7, b^7, secured to the lamp casings, as for instance by means of brackets a^8, b^8, fastened to the sides thereof. Electric, calcium or any other suitable source of light, well known to those skilled in the art, may be employed in the lamps for projecting the images upon the screen.

The slides are usually in the form of glass plates 20, which bear the views or adver-

tisements that are to be projected upon the screen, and said slides are arranged in two series, one series for each apparatus, carried by slide carrying members C, D, here shown in the form of disks, rotatably carried by the lamp casings and having actuating mechanism for intermittently and alternatively rotating them in step by step manner, whereby one series of slides may remain stationary during the exposure period, while the other series is being moved to bring a subsequent slide into active position. When disks are employed as the means for carrying the slides, a series of exposure openings 21, are provided in each slide carrying member C, D, said openings being circumferentially around the disks, the axes of rotation of said disks being so arranged with respect to the lenses that the openings in the disks may be brought successively into register with the associated lenses. Conveniently, the slides 20, rest against shoulders or flanges 22, formed at the openings 21, and they may be held in place by spring buttons 23, pivotally secured to the disks and arranged to bear against the slides near their side edges, as clearly indicated in Figs. 10 and 11. The disks C, D, are rotatably mounted upon shafts 24, 25, carried by brackets 26, 27, at one end, and by brackets 28, 29, at the other end, the last named brackets being secured to the front walls of the lamp casings a^2, b^2; the brackets 26, 27, are secured to the forward ends of the tubular supporting members a^7, b^7 (see Figs. 1 and 3). To permit of the removal of the disks C, D, or to permit said disks to be turned around upon their supporting shafts, the latter are shiftably mounted in their supports, and coiled compression springs 30, are interposed between the front walls of the lamp casings and collars 31, which collars are fast on the shafts and bear against the hubs of the disks, the tension of the springs being exerted to hold the shafts in the bearings in the brackets 26, 27. To remove a disk, its collar 31 is pressed back toward the lamp, carrying with it the shaft, until the latter has been withdrawn from the hub of the disk.

The mechanism illustrated for advancing the disks in a step by step manner, consists of shafts 32, 33, journaled in bearings formed in the shutter supporting frames a^5, b^5, and the brackets 26, 27, said shafts being geared together so as to rotate in unison, and the gearing being here shown as comprising sprocket wheels 34, fastened on the shafts 32, 33, and a sprocket chain 35, trained over said sprocket wheels. Take-up mechanism is provided for the sprocket chain, 35, so that the upper lamphouse and parts carried thereby may be tilted to focus the upper instrument upon the screen, and said take-up mechanism 35^a is here shown as comprising an arm, 35^a, pivotally supported on the bracket, 27, and carrying a roller which bears against the sprocket chain, 35, the arm being spring pressed toward the chain so as to take up any slack therein when the lamphouse is tilted thereby bringing the sprocket wheels 34, closer together. Crank arms 36, 37, are secured to the ends of the shafts 32, 33, adjacent to the disks, and said crank arms are arranged to engage with pins 38, 39, secured to the disks C, D, there being one pin for each slide, (see Fig. 10) to move said disks in their step by step movement. In the form of mechanism here shown, the crank arms move said disks only through a part of the distance traveled by them and additional means are provided for completing the movement; this comprises arms 40, 41, pivotally mounted upon the tubular supports a^7, b^7, and having rollers 42, that ride upon the edge portions of the disks, which are notched to provide V shaped portions 43, one for each slide.

Collars are secured to the tubular members a^7, b^7, on each side of the arms 40, 41, to hold them against lateral movement, and springs 45, secured to the brackets 26, 27, bear against said arms in such manner as to press the rollers 42, against the V shaped edge portions on the peripheries of the disks. The result is that each crank arm moves its disk from a position in which the roller presses against the base of the notch between the V shaped portions, to a position where it reaches the point or just beyond the point thereof, whereupon the spring 45 acts to force the roller down the inclined portion, causing the disk to complete its movement, and bringing the next slide into locked position in register with the lens. The two crank arms are so timed with respect to each other that either disk may remain stationary throughout its exposure periods, during a portion of which periods the other disk is being moved to change the position of its slides.

The shutter mechanisms for the lenses may conveniently comprise disk like shutters 46, 47, (see Figs. 2 and 5) each pivotally supported upon an arm or bracket 48, secured to the lens tube, associated therewith, by a clamp 49, fastened upon the tube. A cam block 50, is non-rotatively mounted upon each shaft 32, 33, which block has a cam groove, in which travels a pin 51, upon the arm 52, of the shutter disk 46—47, and said groove is shaped and arranged to move said pin through an arch of such extent as to swing the shutter disk from a position covering the lens to one entirely beyond the same, and vice versa. To permit of longitudinal adjustment of each entire objective lens and its frame, each cam block is slidably mounted on its shaft and has a key 53, seated in a keyway 53^a, in the shaft. For

convenience each cam block has a hub 54, extending on one side thereof, which projects through one end of the arm or bracket 48, and a ring 55, is secured thereon to hold the cam and arm together. Conveniently the arm 52, of the shutter disk is pivotally connected to the arm or bracket 48, by means of a headed pin 56, seated in a sleeve 57, secured to the arm or bracket 48. The shutter mechanisms are so timed with respect to the mechanisms which actuate the slide carrying disks, that during the movement of each disk, its associated shutter remains closed and the opposite shutter remains open. The two shutters are so timed with respect to each other as to have one pass across its lens, in coming to its closed position, while the other one passes across the lens toward its open position, the result being that the image projected from the slide of one disk gradually dissolves into the image projected from the slide of the other disk.

The slide carrying disks and shutter actuating mechanism may be driven by a motor E, speed reducing gearing being interposed between it and one of the shafts which drive the said mechanisms. Conveniently a worm pinion 60, upon the motor shaft and meshing with a worm gear 61, on a shaft 62, seated in the bracket 26 and a bracket 63, a small sprocket wheel 64, carried by the worm gear 61, a large sprocket wheel 65, fast on the shaft 32, and a sprocket chain 66, trained over said sprocket wheels may comprise a simple form of speed reducing gearing between the motor and driven mechanism.

In the use of the apparatus it is placed in front of the screen or curtain, or behind the same if a transparent one is used—for instance, where it is desired to project the images on a transparent screen to be viewed from the outside of a building. For this reason the pins 38, 39, project from both sides of the disks, so that the latter may be reversed in the apparatus, thereby avoiding the necessity of reversing the individual slides in the disks.

The motor having been set in motion the operation of the apparatus is as follows:—Both shafts 32, 33, are slowly rotated in the direction of the arrows (see Figs. 2 and 10) and therewith the crank arms and cam blocks. While one shutter is open, for instance the upper one, the lower one is closed, the upper disk is stationary and the view on the slide in register with the lenses is being projected upon the screen. The upper crank arm has already passed a pin on its associated disk, and the lower crank arm is approaching or has engaged a pin on its associated disk (see Fig. 10) and moves said disk in the direction of the arrow until the roller 42, reaches the point of the adjacent portion of the rim, whereupon the spring pressed arm 40, forces the roller down into the notch between two V portions completing the movement of the disk to bring the succeeding slide into register, with the lower lenses, and locking it in such position, thereby holding it perfectly stationary during its exposure period. The continued rotation of the shafts 32, 33, and cam blocks simultaneously close the upper shutter and open the lower one, thereby causing the image from the upper slide to dissolve or merge into the image from the lower slide, after which the upper crank arm acts on the upper disk and so on.

The adjustment screw at the rear of the apparatus, and slidable connection between the objective lenses with the lamps afford means for properly focusing the apparatus.

More or less variation of the exact details of construction is possible without departing from this invention. Other equivalent forms of slide carrying members may be employed, as, for instance, endless chains may be substituted for the disks for carrying the slides and many other modifications are possible. I desire, therefore, not to limit myself to the particular form of mechanism illustrated and described, but intend in the following claims to point out all of the invention disclosed herein.

I claim as new and desire to secure by Letters Patent:—

1. In a stereopticon, two units comprising two lamps, lenses therefor, two rotatory slide carrying disks, one for each lamp, said disks having circumferentially arranged exposure openings, arranged to be brought successively into register with said lenses and having pins, one for each opening, supports for said disks, two shafts, one for each disk, a crank arm carried by each shaft and arranged to engage said pins, and therewith partially rotate the disks, each crank arm being timed to act on its disk while the other disk is at rest, one of said units being pivotally connected to the other, means for varying the angular relation between said units and means for slowly rotating said shafts in unison, including gearing between said shafts having take-up means therein.

2. In a stereopticon, the combination of two units, each comprising a lamp casing, lens supporting means carried thereby, a disk supporting bracket carried by said lens supporting means, a slide carrying disk journaled on said bracket, a disk actuating shaft journaled in said lens supporting means and bracket, a disk actuating arm mounted on said shaft, and shutter mechanism operatively connected to said shaft; sprocket wheels on said shafts, a sprocket chain trained over said sprocket wheels, and motor driven gearing for one of said shafts; said units being timed to display views alternately.

3. In a stereopticon, the combination of

two units, each comprising a lamp casing, tubular lens supports secured to the lamp casing, lens supporting rods slidably secured in said tubular lens supports, a lens supporting frame carried by said rods, a lens carried by said frame, a disk supporting bracket secured to said tubular lens support, a slide carrying disk journaled on said bracket, a disk actuating shaft journaled in said bracket and lens carrying frame, a disk actuating arm on said shaft, and shutter mechanism operatively connected with said shaft, and adjustable with respect thereto; both disk actuating shafts being geared together to rotate in the same direction, and motor driven gearing for one of said shafts, the arms on said shafts acting to move the disks alternately to bring the slides thereof alternately into register with the lenses.

In witness whereof I have executed the above at Chicago, Illinois, this 28 day of March, 1914.

WALTER J. ASHLEY.

Witnesses:
A. C. FISCHER,
CHARLES O. SHERVEY.