No. 652,714. Patented June 26, 1900.

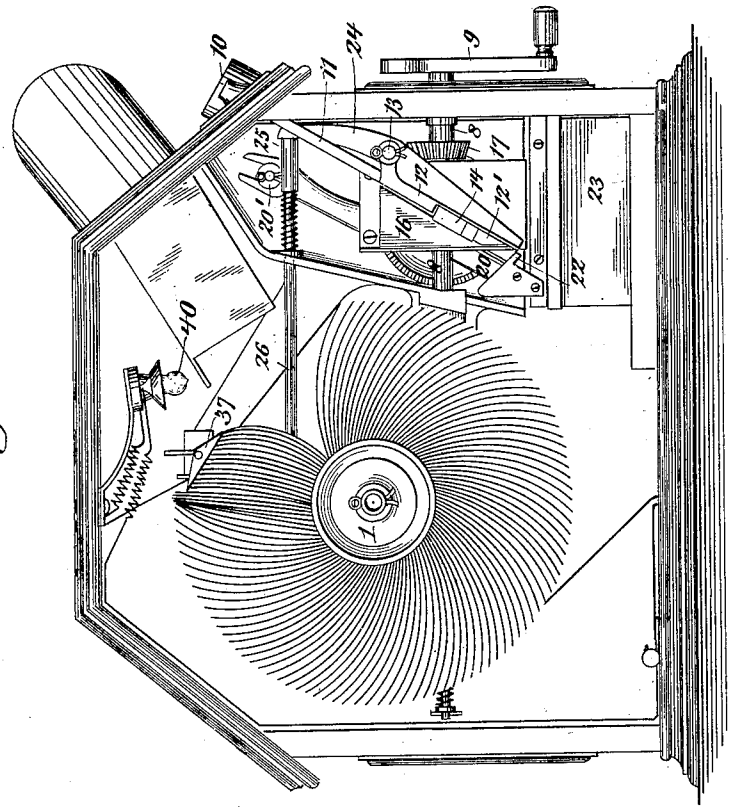
H. CASLER.

CONSECUTIVE VIEW APPARATUS.

(Application filed Mar. 1, 1899.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



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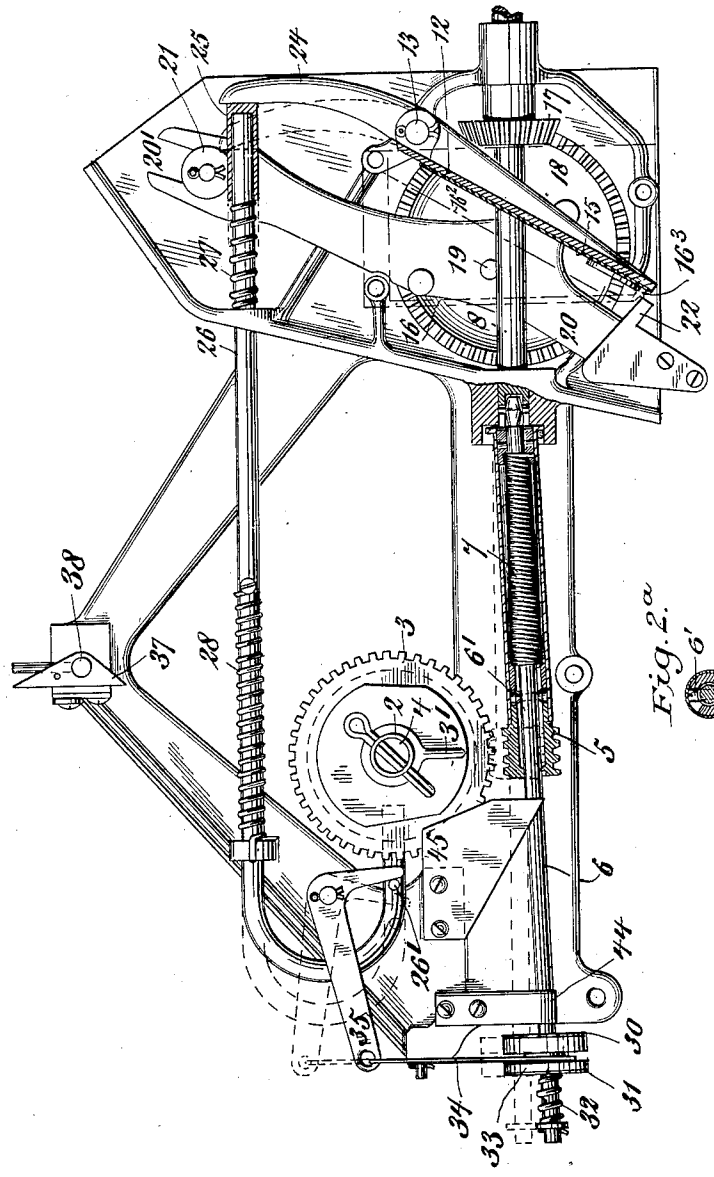


Fig. 2.

Fig. 2a.

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(No Model.) 4 Sheets—Sheet 3.

Fig. 3,

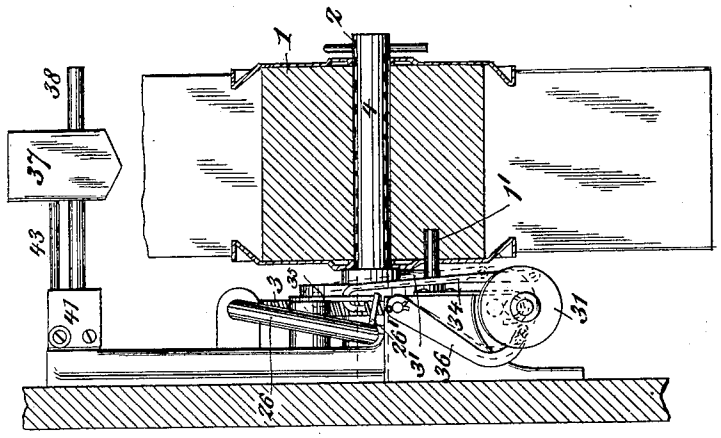


Fig. 5,

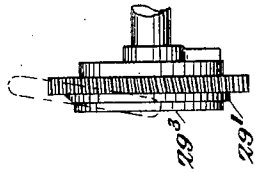


Fig. 7,

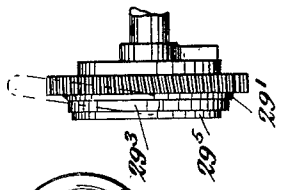


Fig. 4,

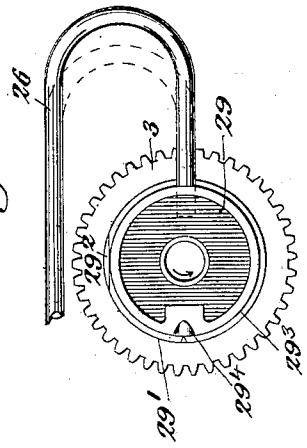
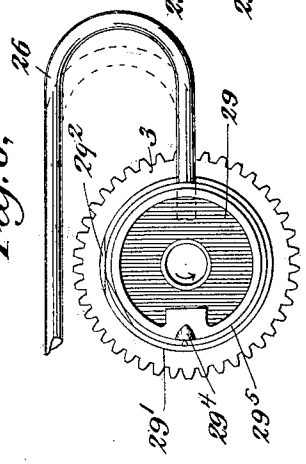


Fig. 6,



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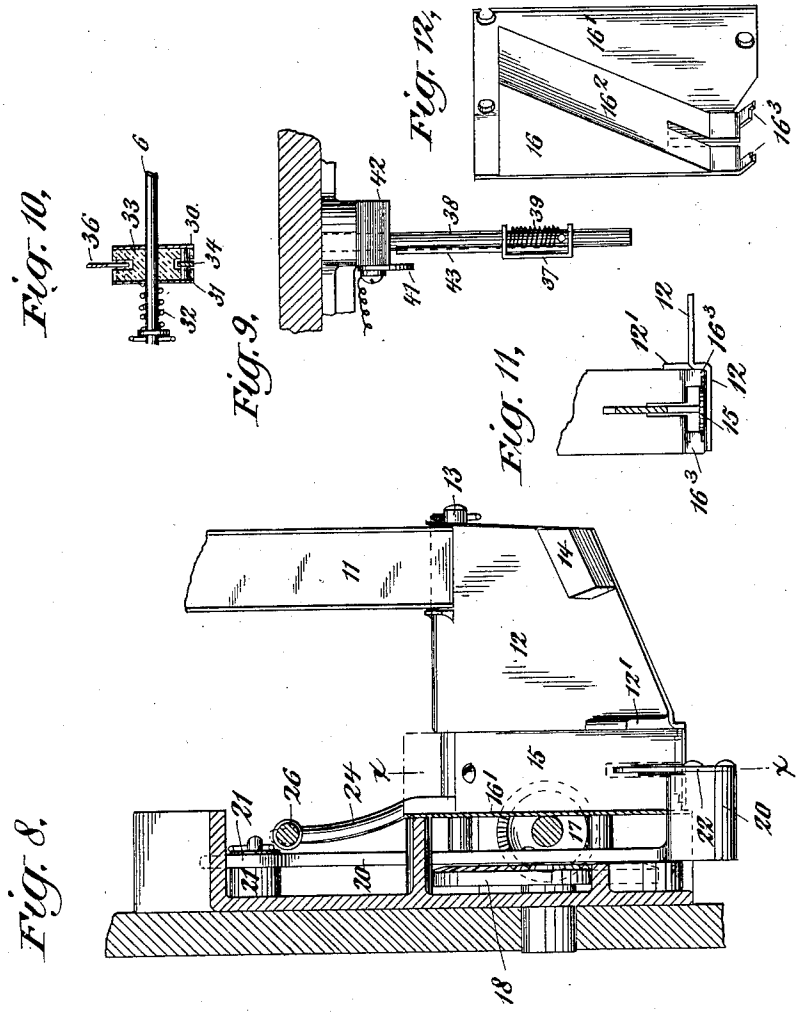
No. 652,714. Patented June 26, 1900.

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CONSECUTIVE VIEW APPARATUS.

(Application filed Mar. 1, 1899.)

(No Model.) 4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

HERMAN CASLER, OF CANASTOTA, NEW YORK, ASSIGNOR TO THE AMERICAN MUTOSCOPE COMPANY, OF NEW JERSEY.

CONSECUTIVE-VIEW APPARATUS.

SPECIFICATION forming part of Letters Patent No. 652,714, dated June 26, 1900.

Original application filed February 2, 1898, Serial No. 668,796. Divided and this application filed March 1, 1899. Serial No. 707,295. (No model.)

To all whom it may concern:

Be it known that I, HERMAN CASLER, a citizen of the United States, residing at Canastota, in the county of Madison and State of New York, have invented certain new and useful Improvements in Consecutive-View Apparatus; 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.

My invention relates to a consecutive-view apparatus, and particularly to mutoscopes such as are covered by Patent No. 549,309, granted to me and dated November 5, 1895, in which the appearance of motion is produced by passing rapidly before the eye a series of picture-cards mounted upon and projecting outwardly from a movable reel or carrier.

My invention consists in the novel releasing device employed for throwing the operating-handle out of connection with the reel when a revolution of said reel has been completed or when the operating-handle is released by a person who has been turning it and for relieving the cards of strain when the operation of the apparatus ceases and in an automatic device for controlling the illumination of the pictures as they are successively presented in the line of vision which turns on the light as soon as the operation of the apparatus commences and turns off the light as soon as the operation of the apparatus ceases, so economizing battery-power.

The automatic device for controlling the illumination of the apparatus is an improvement upon and substitute for the device for the same purpose illustrated and described in the patent of H. N. Marvin for improvements in consecutive-view apparatus, dated November 22, 1898, No. 614,738.

This application is a division of my application filed February 2, 1898, Serial No. 668,796.

The objects of my invention are to improve and simplify consecutive-view-exhibiting apparatus, such as mutoscopes, and particularly to improve and simplify the mechanism employed for stopping the motion of the reel when a revolution thereof is completed, for relieving the cards of strain when the operation of the apparatus ceases, for preventing injury to the cards through the turning of the operating-handle in the wrong direction, and for turning on the light when the operation of the apparatus commences and for turning off the light when the operation of the apparatus ceases. These objects are attained in the invention herein described, and illustrated in the drawings which accompany and form a part of this specification, in which the same reference-numerals indicate the same or corresponding parts, and in which—

Figure 1 is a general front elevation of a mutoscope containing the invention herein described, the door which forms the front of the case of the mutoscope having been removed. Fig. 2 is a detail front elevation of the mechanism of the mutoscope, the picture-reel and the front of the coin-chute and the operating-crank having been removed and the inclined coin-table being sectioned through the line xx of Fig. 8—that is, through the coin-chute. Fig. 2^a is a detail transverse section of the shaft 6 and worm 5, through the slot in which the pin 6′ works. Fig. 3 is a detail end elevation of the mechanism, taken from the left of Fig. 2, the reel being shown in section. Fig. 4 is a detail rear elevation of the tripping-cam and tripper. Fig. 5 is a detail side elevation of the tripping-cam and tripper. Figs. 6 and 7 are views similar to Figs. 4 and 5, respectively, but show the construction of the tripping-cam when modified to permit two complete revolutions of the picture-reel for each coin deposited. Fig. 8 is a detail elevation, looking from the left of Fig. 2, of those portions of the mechanism which have to do directly with the passage of the coin through the apparatus, these parts being at the right of Fig. 2. Fig. 9 is a detail plan view of the automatic switch which turns on and off the electric light by which the picture-cards are illuminated. Fig. 10 is a sectional detail view of the friction-disks by which the worm is moved up into engagement with the worm-wheel. Fig. 11 is a detail view of the end of the cam-chute looking directly at said end and in line with the chute; and Fig. 12 is a

detail view of the piece 16, which forms the top and one side of the coin-chute, detached from the rest of the mechanism.

In the drawings, 1 is a reel carrying a series of resilient picture-cards which project outwardly from the reel and at their inner ends are rigidly secured to the reel, as described in Patent No. 549,309. This reel is mounted upon a bushing 2, which itself carries and has secured to it a worm-wheel 3. The bushing 2 is revolubly mounted upon a stationary spindle 4. (Indicated in dotted lines in Fig. 3.) A pin 1′ upon the rear of the picture-reel is adapted to engage with a shoulder 3′ upon the worm-wheel 3, so as to drive the reel.

The worm-wheel 3 is arranged to be rotated by a worm 5, mounted upon a shaft 6 and not keyed to said shaft, but arranged to be driven by the shaft through a pin or key 6′, working in a slot in the worm 5. A coiled spring 7 also connects the shaft 6 and worm 5. This worm is normally out of engagement with the worm-wheel 3, but moves up into engagement with said worm-wheel when the tripper 26, hereinafter mentioned, is pushed inward and the shaft 6 rotated. The shaft 6 is connected through a universal joint with a crank-shaft 8, having upon it a crank 9, (shown in Fig. 1,) which forms the operating-handle.

26 is a sliding tripper mounted in guides in the frame of the mechanism, which guides are arranged to permit the tripper to reciprocate to the right and left of Fig. 2. A spring 28 surrounds the tripper and is secured thereto at one end and at the other end is secured to the frame of the mechanism and is arranged to act both as a compression and as a torsion spring.

The end of the tripper 26 is bent downward, as shown in Fig. 2, so as to be adapted to ride upon the face of a tripping-cam 29, upon the rear side of the worm-wheel 3. (Shown in Figs. 3 to 7, inclusive.) The spring 28 by its torsional action tends to swing the tripper 26 to the right of Fig. 3, and when the tripper has been pushed to the left of Fig. 2 by any device employed for that purpose—as, for instance, by the arm 24 of the coin-operated controlling mechanism hereinafter described—the spring 28 is enabled to oscillate the tripper, so that its end rests upon the outer face 29′ of the cam 29.

Upon the left-hand end of the shaft 6 are two friction-disks 30 and 31, Figs. 2 and 10, both arranged to revolve with the shaft. A spring 32 upon said shaft presses the disk 31 toward the disk 30. Between the disks 30 and 31 is a disk 33, loose upon the shaft. A link 34 is pivoted at one end to this disk 33 at a point to one side of the center thereof and is connected at the other end to a pivoted bell-crank lever 35. Another link 36 (see Figs. 3 and 10) is pivoted to the disk 33 upon the other side of its center and is connected to the frame of the machine. A pin 26′ upon the tripper 26 rests against the bell-crank 35. When the tripper 26 is in its normal position—that is, in the position shown in full lines in Fig. 2—the disk 33 is caused to slip between disks 30 and 31, the friction being insufficient to overcome the pressure of the spring 28 upon the tripper 26; but when the tripper has been moved to the left into the position shown in dotted lines in Fig. 2 the bell-crank is free to move and the friction of the disks 30 and 31 overcomes the weight of the shaft 6 and causes the disk 33 to rotate about its point of connection, with link 36 as a pivot, thus rolling upward upon said link and lifting the shaft 6, thus moving the worm 5 into engagement with the worm-wheel 3. As soon as the worm is in engagement with the worm-wheel the worm-wheel and reel 1 begin to revolve.

When the rotation of the worm-wheel 3 commences, the tripping-cam 29 (shown in Figs. 4 and 5) is in a position about diametrically opposite to that position in which it is shown in Figs. 4 and 5, and the end of the tripper rides upon the top ridge 29′ of the cam. The rotation of the cam is in the direction indicated by the arrow. In the outer face 29′ of this cam is a beveled, inclined, or wedge-shaped portion 29^2, which when it reaches the end of the tripper causes said tripper to slip down, under the action of the spring 28, upon the second face 29^3 of the cam. In this second face 29^3 and at a point close to the point on the face 29′ where the tripper rested upon the cam when the revolution began is another beveled, inclined, or wedge-shaped portion 29^4. The pressure of the spring 28 causes the tripper to slide down this incline 29^4 as soon as said incline reaches it, thus causing the tripper to slip entirely off the edge of the cam and leaving it free to return to its original position. (Shown in full lines in Fig. 2.) When the tripper is released in this manner, the pin 26′ strikes the bell-crank 35 and forces the friction-disk 33 downward, thus moving the worm 5 out of gear with the worm-wheel 3 and stopping the revolution of the apparatus.

As explained in the above-mentioned Patent No. 549,309, in mutoscopes a detent is employed which engages the ends of the cards at a point just back of the field of view, putting the cards under tension as the reel revolves, and each card when it has passed said detent springs forward with considerable velocity across the field of view. In this way each card remains for an instant substantially stationary and with its face clearly visible in the field of view and then springs forward with great rapidity across the field of view, thus exposing to view the next succeeding card. 37 is this detent. It is pivotally mounted upon a shaft 38. The detent normally occupies the position shown in Figs. 2 and 3, in which position it lies between the cards, with the cards relieved from tension; but when the reel begins to rotate the cards

move the detent into the position shown in Fig. 1, in which position the cards are free to slip under it after they have been put under a sufficient amount of tension. When the reel is released by the action of the tripper 26, the tension of the cards forces the detent back into the position shown in Figs. 2 and 3 and moves the reel backward sufficiently to relieve the tension on the cards. It is advisable to relieve the tension on the cards in order that they may not acquire a permanent set. One important function of my invention consists in employing this detent 37 to actuate an electric switch, by which the current of the lamp which illuminates the pictures is turned on when the operation of the apparatus begins and is turned off when the operation of the apparatus ceases. 40, Fig. 1, is this lamp. One terminal of its circuit is connected to a flexible contact-piece 41, secured to a block 42 of insulating material. The other terminal of the circuit is connected to the metallic framework of the apparatus, and therefore is connected to the shaft 38 and the detent 37 thereon. This detent 37 carries a pin 43, which when the detent rotates into the position shown in Fig. 1 makes contact with the flexible contact-piece 41, so completing the circuit of the lamp 40 and turning on the light. When the reel turns backward, however, so that the detent returns to its normal position, the pin 43 breaks contact with the piece 41, and the light is turned off. In the drawings a spring 39 is shown mounted upon the shaft 38 and tending to hold the detent in the position shown in Figs. 2 and 3. This spring is not a necessary feature of the apparatus, but may be employed, if desired, its function being to hold the detent in such a position that the electric switch is open at times when no reel is in the apparatus.

The shaft 6 is supported in its lower or normal position by a loop 44, of sheet metal, which also serves as a guide to the shaft when it moves up and down. A plate 45, which serves to hold the gear-wheel 3 in place, may also serve as an additional guide for the shaft.

The purpose of the spring 7, which serves as a connecting medium between the shaft 6 and worm 5, is to automatically disconnect the worm 5 and worm-wheel 3 in case the operating-crank 9 should be released before the cam 29 has been rotated far enough to operate the tripper 26 and throw the worm out of gear. The spring 7 is of course under tension while the shaft 6 is revolving, and if the crank 9 be released the spring causes a backward rotation of the shaft 6, which necessarily moves the shaft downward.

The operation of the apparatus is as follows: When the tripper 26 is pushed to the left of Fig. 2 by any convenient device—as, for instance, by the coin-operated controlling mechanism hereinafter described—the spring 28 swings it to the right of Figs. 3 and 5, so that its end rests upon the upper shoulder 29′ of the cam 29. Before the tripper has been moved to the left in this manner rotation of the shaft 6 has no effect upon the reel, since the worm 5 is out of gear with the worm-wheel 3, and the pin 26′, bell-crank 35, and link 34 together form a locking device, which prevents the shaft 6 from rising, the disk 33 slipping between the disks 30 and 31; but after the tripper has been moved to the left in the manner above described rotation of the operating-crank 9 and shaft 6 in a forward direction causes the shaft, with the worm 5 thereon, to rise, the disk 33 rolling upward upon the link 36. The worm is thus brought into mesh with its worm-wheel. Some further rotation of the crank 9 and shaft 6 is absorbed by the spring 7 until the pin 6′ upon the shaft 6, which pin works in a slot in the worm 5, as already stated, and acts as a key to transmit motion from the shaft 6 to the worm 5, reaches the end of its slot. The reel then begins to rotate, the detent is moved into the position shown in Fig. 1, thus turning on the light, and the cards begin to pass under the detent and across the field of view. After the reel has rotated a short distance the first beveled portion 29^2 of the tripping-cam 29 reaches the tripper 26 and forces the tripper down upon the second face 29^3 of said cam. The purpose of this will be hereinafter explained. After the reel has rotated until it is opposite the position where the cards first began to slip under the detent the tripper encounters the second beveled portion 29^4 of the cam 29 and is forced over the edge of said cam and to the right of Fig. 2 by its spring 28, the pin 26′ striking the bell-crank 35 and moving the friction-disk 33 and shaft 6 downward, thus throwing the worm 5 out of mesh with the worm-wheel 3. As soon as the worm is out of mesh with the worm-wheel the detent 37 returns to its normal position, rotating the reel backward, so as to relieve the tension on the cards and turning off the light. If the crank 9 should be released at some intermediate point, the shaft 6 will be rotated backward by the spring 7 because of the tension of said spring produced by the motion of the shaft 6 after the worm 5 engaged the worm-wheel 3, but before the pin 6′ reached the end of its slot in said worm, and the worm 5 is disengaged from the worm-wheel 3, thus permitting the reel to turn backward, relieving the cards of tension and turning off the light. If after being so released the crank 9 is again rotated in a forward direction, the worm 5 will be moved up into engagement with the worm-wheel 3, and the reel will rotate again until rotation is stopped by the action of the tripper.

The purpose of employing two faces upon the tripping-cam 29 may now be seen. If after the reel has been rotated through, say, half a revolution the crank 9 should be released and the person who has been operating the machine should leave it and then another person ignorant of the fact that the first person has left the machine in an inter-

mediate position should begin to operate the machine, then if the cam 29 were not provided with two faces the second person would see but half of the pictures. This is obviated by the employment of the two faces, for even though the machine be left at an intermediate point, with the tripper 26 resting upon the lower face of the cam 29, when said tripper is again pressed to the left (as, for instance, when another coin is deposited in the coin-operated controlling mechanism hereinafter described and the crank 9 again rotated) the tripper is raised to the first face of the cam 29. If the third face or shoulder be added to the cam, the reel will make two revolutions before the cam releases the tripper.

In the drawings I have shown the driving mechanism of the mutoscope as controlled by a coin-operated controlling mechanism which when a coin of proper denomination is deposited in it and the crank 9 is turned pushes the tripper 26 to the left of Fig. 2. I do not limit myself, however, to the use of a coin-operated controlling mechanism in connection with the apparatus, but may operate the tripper by other means. The coin-operated controlling mechanism forms the subject-matter of an application for Letters Patent filed February 2, 1898, Serial No. 668,796. Its construction is as follows: In the inclined end of the case of the mutoscope is a slot-piece 10, containing a slot, (not shown,) into which a coin may be deposited when the apparatus is to be operated. The slot is of such size as not to admit a coin of greater dimensions than the coin for which the apparatus is intended. A coin so deposited passes through a slide 11, Figs. 1 and 8, upon an inclined coin-table 12, pivoted upon a shaft 13 and provided with a deflecting-piece 14 in the path of the coin and beveled so as to deflect the coin to the left of Fig. 8. Coins are usually composed of hard and resilient metals or alloys, and when such a coin strikes the deflecting-piece 14 it is not only deflected to the left of Fig. 8, sliding over the surface of the table 12, but rebounds, so as to clear the upper edge of a guard 12′, and slides upon a leaf-spring 15, which is secured to the table 12, but is located in a slight recess in said table, so that the spring is slightly below the face of the plate 12. Further sidewise motion of the coin is prevented by the side plate 16′ of an angular piece 16, secured to the frame of the mechanism, which has an oblique face 16^2, as indicated in dotted lines in Fig. 2, forming the front of the coin-chute and serving to confine the coin in said chute. The edge of the recess in table 12 and the guard 12′ prevent the coin from escaping from the chute by rebounding to the right, so that the coin slides down by gravity to the lower end of the chute, where, if it be of the proper denomination and size, it is held between two stops 16^3 of the piece 16, as indicated in dotted lines in Fig. 2 and as shown in Figs. 11 and 12. These stops are placed at such distance apart that if the coin be of smaller diameter than coins of the denomination which it is intended shall cause the operation of the apparatus it will pass between the stops and will not cause the operation of the apparatus. The stops are cut away, as shown, so that a disk of less thickness than the proper coin will not be held. The coin is released from the stops 16^3 by the action of a rotating releasing-finger 22, operated as follows: Upon the shaft 8 is a bevel-pinion 17, Figs. 1 and 2. Engaging with this pinion is a bevel gear-wheel 18, revolubly mounted and having a crank-pin 19, upon which the arm 20, carrying the releasing-finger, is mounted. This arm 20 has an upper forked end 20′ working upon a guide 21. Upon the lower end of the arm is the releasing-finger 22, which works through slots in the parts of the coin-chute. When the gear-wheel 18 revolves, this finger has imparted to it a nearly-circular motion, which carries it against any coin which may be held in the chute. It strikes the coin at or close to its center and pushes the coin backward, together with the inclined coin-table 12, until the coin is freed from the stops 16^3, and then drags the coin down and releases it, causing it to drop down into a suitable receptacle 23. The inclined table 12 has an upwardly-projecting arm 24, which abuts against a sleeve 25 upon the end of the tripper 26, already mentioned. A spring 27, surrounding the tripper, presses the sleeve 25 to the right of Fig. 2, thus normally holding the table 12 in the position shown in the drawings. This coin-operated controlling mechanism is so constructed as to detect leaden disks, washers, and the like of about the size of the coin by which it is intended that the operation of the mechanism shall be controlled. For the detection of leaden disks advantage is taken of the fact that lead is less resilient than the harder metals of which coins are made. A leaden disk passing down the slide 11 and encountering the deflecting-piece 14 will not rebound sufficiently to clear the upper edge of the guard 12′, but will pass downward through the open space between the guard 12′ and the deflecting-piece 14. (Shown in Fig. 8.) A washer which, because composed of some hard metal, may clear the upper edge of the guard 12′ will be detected by the releasing-finger 22, which will pass through the central hole of the washer without moving the table 12 about its pivot to a sufficient extent to move the tripper opposite one of the ridges in the cam 29, but will nevertheless drag the washer out of the coin-chute, and a disk which is thinner than the coin will not be held by the stops 16^3, because of the way in which these stops are cut away.

The function of the spring 15 is simply to compensate for possible warping of the coin-table 12. This table is a casting and is liable to be warped to some extent, and the effect of this warping might be to cause it to droop at the end of the coin-chute. To avoid the

necessity of machining the table, the spring 15 is employed, which, since it presses up against the end of the piece 16, as shown in Figs. 2 and 11, compensates for any possible drooping of the corner of the table 12.

By stating in certain of the following claims that the driving device—that is to say, the crank 9 and associated parts—is thrown into driving connection with the picture-carrier when said driving device is moved in a forward direction I mean by the term "forward direction" that direction of motion of the driving device which causes the picture-carrier to rotate in a forward direction and exhibits the pictures successively.

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

1. In a consecutive-view apparatus, the combination, with a movable picture-carrier, of supporting and driving mechanism therefor containing a driving device for the mechanism, and means for interrupting the transmission of motion from such driving device to the carrier and for releasing the carrier when the transmission of motion is so interrupted, leaving the carrier free to move.

2. In a consecutive-view apparatus, the combination, with a movable picture-carrier having a series of picture-cards mounted upon and projecting from it, and means for momentarily arresting the movement of the several cards successively, of supporting and driving mechanism for the carrier, containing a driving device for the mechanism, means for transmitting the motion of such driving device to the carrier, and mechanism which throws said driving device into driving connection with the picture-carrier when said driving device is moved in a forward direction, and automatically throws said driving device out of driving connection with said carrier and releases the carrier when said driving device is released, thereby relieving the cards of strain.

3. In a consecutive-view apparatus, the combination, with a movable picture-carrier having a series of picture-cards mounted upon and projecting from it, and means for momentarily arresting the movement of the several cards successively, of supporting and driving mechanism for the carrier, containing a driving device for the mechanism, gearing for transmitting the motion of such driving device to the carrier, and mechanism which throws said gearing into gear when the driving device is moved in a forward direction, and automatically throws said gearing out of gear and releases the carrier when said driving device is released or moved in a backward direction, thereby relieving the cards of strain.

4. In a consecutive-view apparatus, the combination, with a movable picture-carrier having a series of picture-cards mounted upon and projecting from it, and means for momentarily arresting the movement of the several cards successively, of supporting and driving mechanism for the carrier, containing a driving device for the mechanism, worm-gearing for connecting said driving device to the carrier and driving the same, the worm of said gearing being movably mounted and arranged to be moved out of gear with the worm-wheel, and worm-shifting mechanism which moves the worm into gear with its worm-wheel when the driving device is moved in a forward direction, and automatically moves the worm out of gear with its worm-wheel when said driving device is released or moved in a backward direction, thereby relieving the cards of strain.

5. The combination, with a shaft revolubly and laterally movable, and gearing which is operated by the rotation of said shaft, and is moved into and out of gear by the lateral movement of said shaft, of friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, and a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in one direction it throws the gearing into gear and when rotated in the other direction it throws the gearing out of gear, substantially as described.

6. The combination, with a worm-wheel, a worm, and a shaft upon which said worm is mounted, movable toward and from the worm-wheel, of friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, and a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in a forward direction the worm is moved into engagement with the worm-wheel, and when said shaft is rotated in a reverse direction the worm is moved out of engagement with the worm-wheel, substantially as described.

7. The combination, with a shaft revolubly and laterally movable and gearing which is operated by the rotation of said shaft, and is moved into and out of gear by the lateral movement of said shaft, of friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in a forward direction said gearing is thrown into gear, and a tripping device arranged to move said intermediate disk backward with respect to the other disks, thereby moving said shaft laterally and throwing the gearing out of gear, substantially as described.

8. The combination, with a shaft revolubly and laterally movable and gearing which is operated by the rotation of said shaft, and is moved into and out of gear by the lateral movement of said shaft, of friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, a link connected to said intermediate disk and to a support, whereby when said

shaft is rotated in a forward direction said gearing is thrown into gear, a tripper, a tripping-cam actuated by said gearing, and connection between said tripper and intermediate disk by which said disk is moved backward with respect to the other disks when the tripper operates, thereby moving the shaft laterally and throwing the gearing out of gear, substantially as described.

9. The combination, with a worm-wheel, a worm, a shaft upon which said worm is mounted movable toward and from the worm-wheel, friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, and a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in a forward direction said worm is moved into engagement with the worm-wheel, of a tripper, a tripping-cam upon said worm-wheel, and connection between said tripper and intermediate disk by which said disk is moved backward with respect to the other disks when the tripper operates, thereby moving the worm out of engagement with the worm-wheel, substantially as described.

10. The combination, with a worm-wheel, a worm, a shaft upon which said worm is mounted movable toward and from the worm-wheel, friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, and a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in a forward direction said worm is moved into engagement with the worm-wheel, of a tripping-cam revolving with said worm-wheel and provided with a plurality of adjacent faces of progressively-smaller diameter and cut away to cause a spring-pressed tripper to pass from one face to a lower face as the cam revolves, a spring-pressed tripper arranged to bear against the face of said cam, means for moving said tripper into engagement with the highest face of the cam, when the operation commences, and connection between said tripper and intermediate disk, whereby when the tripper is released by the cam said disk is moved downward with respect to the other disks, thereby moving the worm out of engagement with the worm-wheel, substantially as described.

11. The combination, with a shaft revolubly and laterally movable, gearing which is moved into and out of gear by the lateral movement of said shaft, and a spring interposed between said gearing and shaft, of friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, and a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in one direction it throws the gearing into gear, and when said shaft is released it is rotated in a backward direction by the spring, thereby throwing the gearing out of gear, substantially as described.

12. The combination, with a worm-wheel, a worm, a shaft upon which said worm is loosely mounted, movable toward and from the worm-wheel, and a spring connecting said worm and shaft, of friction-disks mounted upon and revolving with said shaft, an intermediate friction-disk loose upon said shaft, and a link connected to said intermediate disk and to a support, whereby when said shaft is rotated in a forward direction, the worm is moved into engagement with the worm-wheel, and when said shaft is released it is rotated in a reverse direction by the spring, thereby throwing the worm out of engagement with the worm-wheel, substantially as described.

13. In a consecutive-view exhibition apparatus, the combination, with a movable picture-carrier, resilient picture-cards secured thereto and projecting therefrom, and means for driving the carrier, of a movably-mounted detent for engaging the ends of the cards successively so as to expose them to view, arranged to be moved by the cards from its normal position when the carrier first begins to move and to be returned by the cards to its normal position when the operation of the apparatus ceases, thereby relieving the cards of strain, a lamp for illuminating the cards, and a switch controlling the circuit of said lamp and operated by said detent, substantially as described.

14. In a consecutive-view exhibition apparatus, the combination, with a movable picture-carrier, resilient picture-cards secured thereto and projecting therefrom, and means for driving the carrier, of a pivotally-mounted detent normally lying between the cards but arranged to be turned into a tangential position by the cards when the reel begins to rotate, and to be returned by the cards to its normal position when the rotation ceases, thereby relieving the cards of strain, a lamp for illuminating the cards, and a switch controlling the circuit of said lamp and operated by said detent, substantially as described.

15. In a consecutive-view exhibition apparatus, the combination, with a movable picture-carrier, resilient picture-cards secured thereto and projecting therefrom, and means for driving the carrier, of a pivotally-mounted detent normally lying between the cards but arranged to be turned into a tangential position by the cards when the reel begins to rotate, and to be returned by the cards to its normal position when the rotation ceases, thereby relieving the cards of strain, a lamp for illuminating the cards, a contact-piece with which the contact-piece of the detent makes contact as the detent turns into its tangential position, substantially as described.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

HERMAN CASLER.

Witnesses:
S. M. WING,
J. H. POOL.