No. 678,890. Patented July 23, 1901.

H. C. MATTHEWS.

COMBINED TALKING AND PICTURE EXHIBITING MACHINE.

(Application filed June 27, 1900.)

(No Model.) 5 Sheets—Sheet 1.

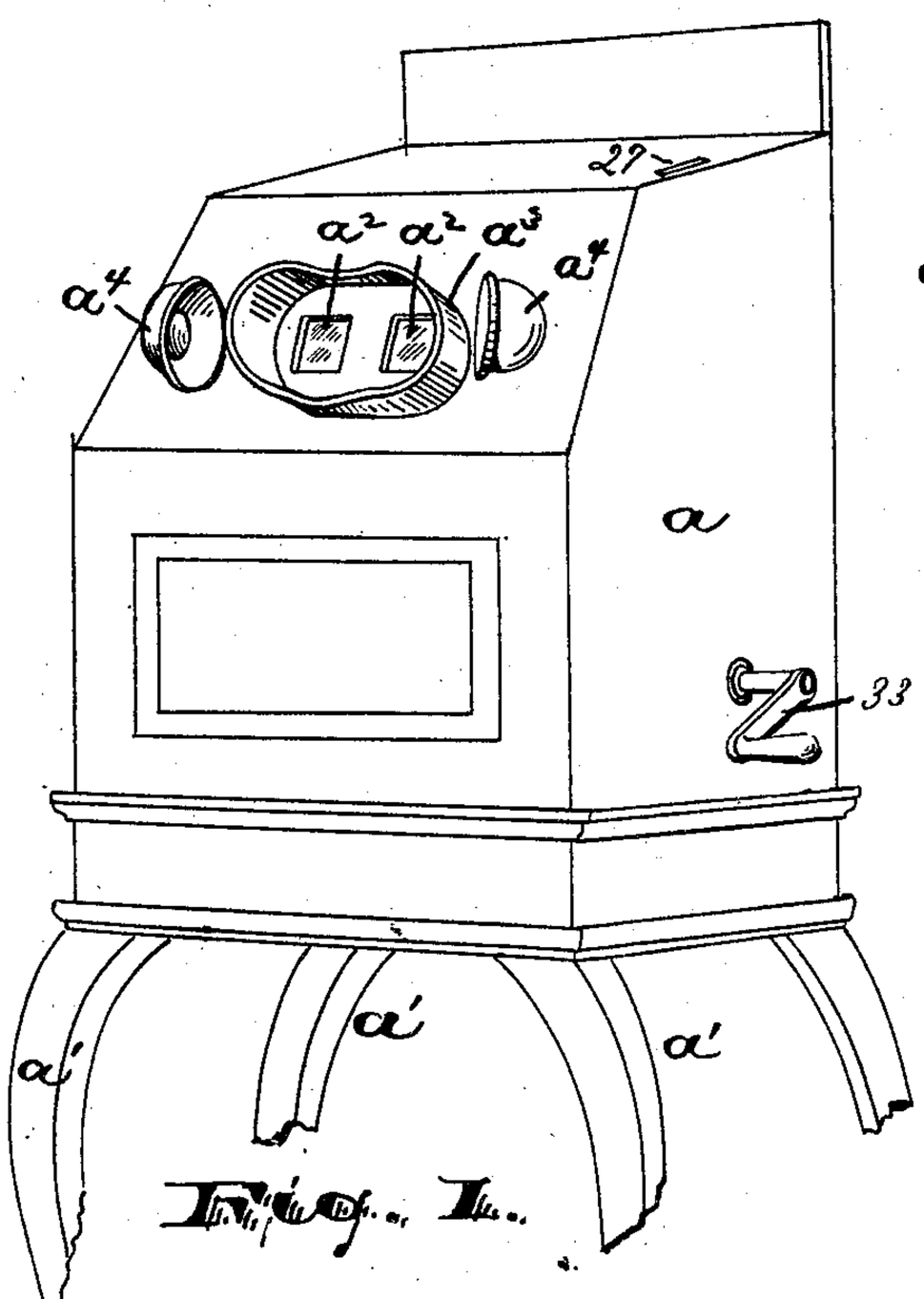

Fig. 1.

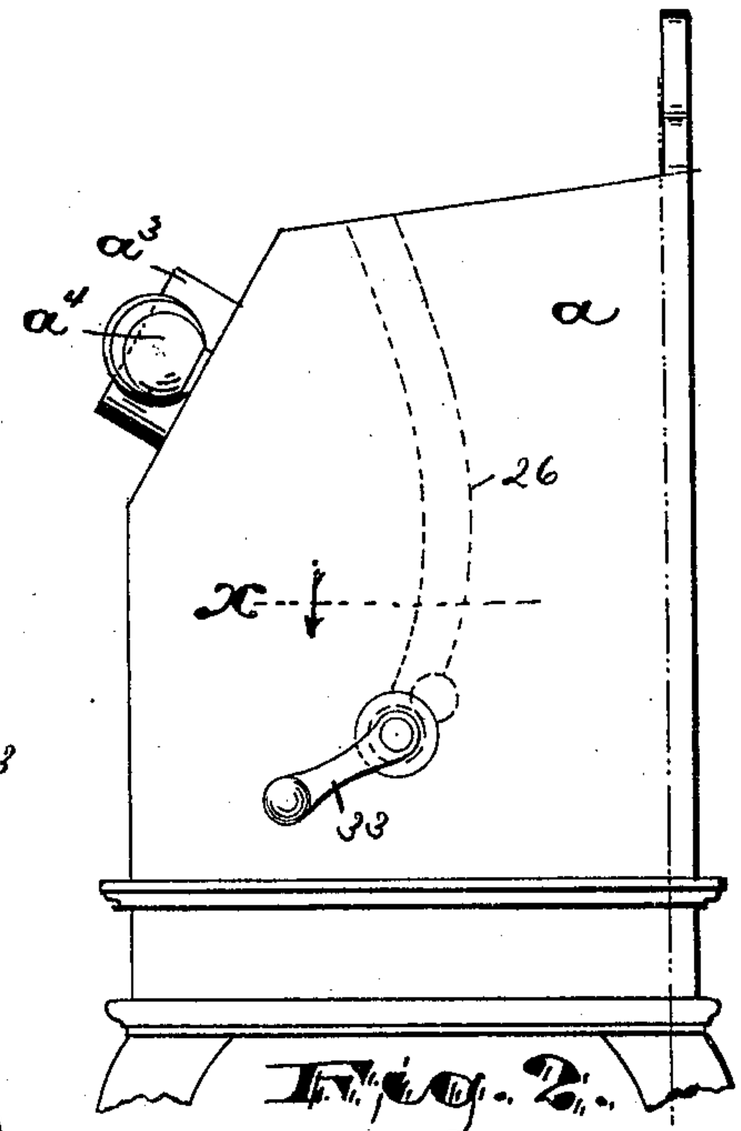

Fig. 2.

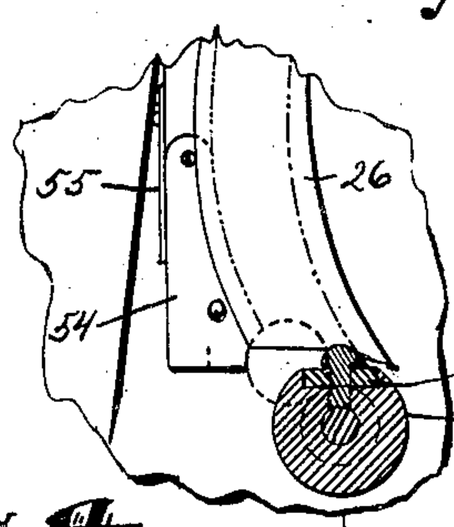

Fig. 4.

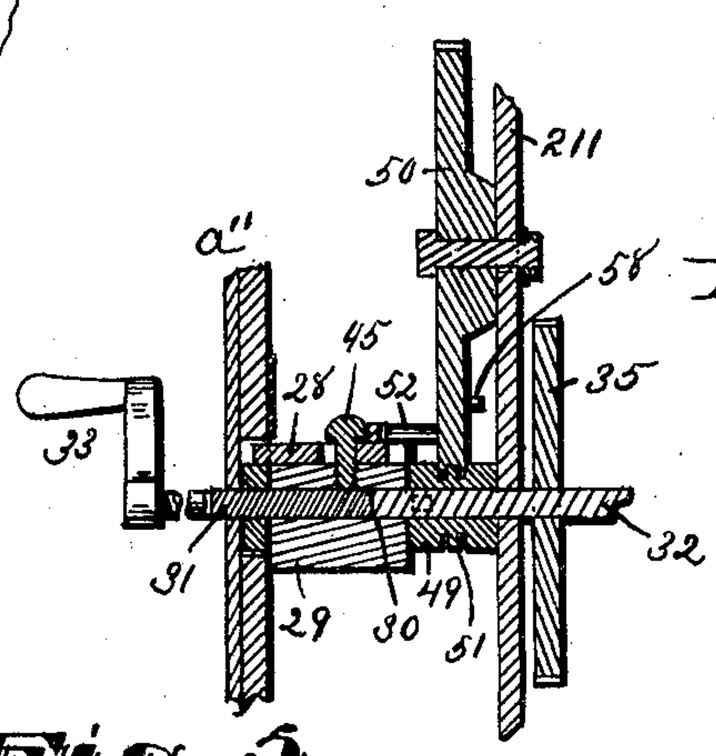

Fig. 5.

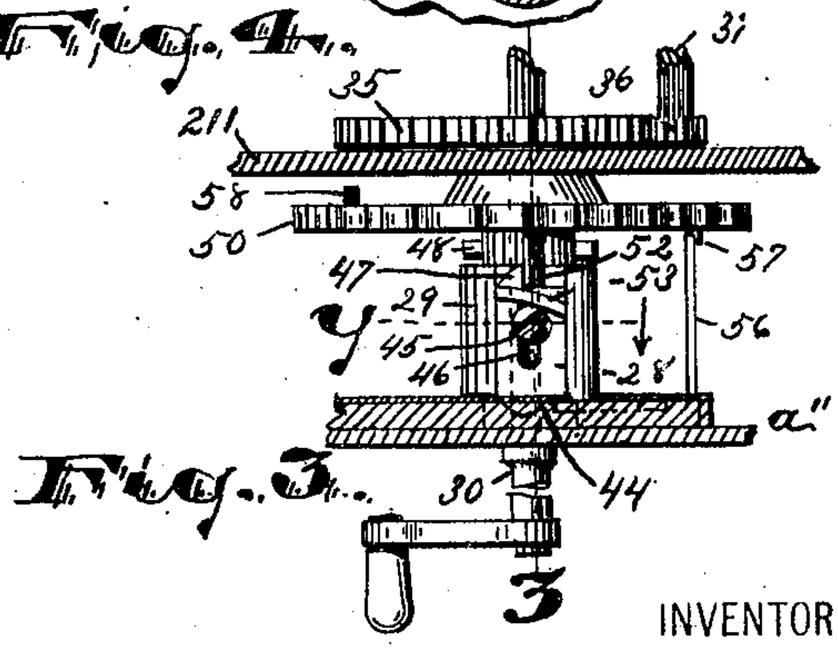

Fig. 3.

WITNESSES:

Henry Strong

Russell M. Everett.

INVENTOR:

Harold C. Matthews,

BY

Drake & Co.

ATTORNEYS

No. 678,890. Patented July 23, 1901.

H. C. MATTHEWS.

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(No Model.) 5 Sheets—Sheet 2.

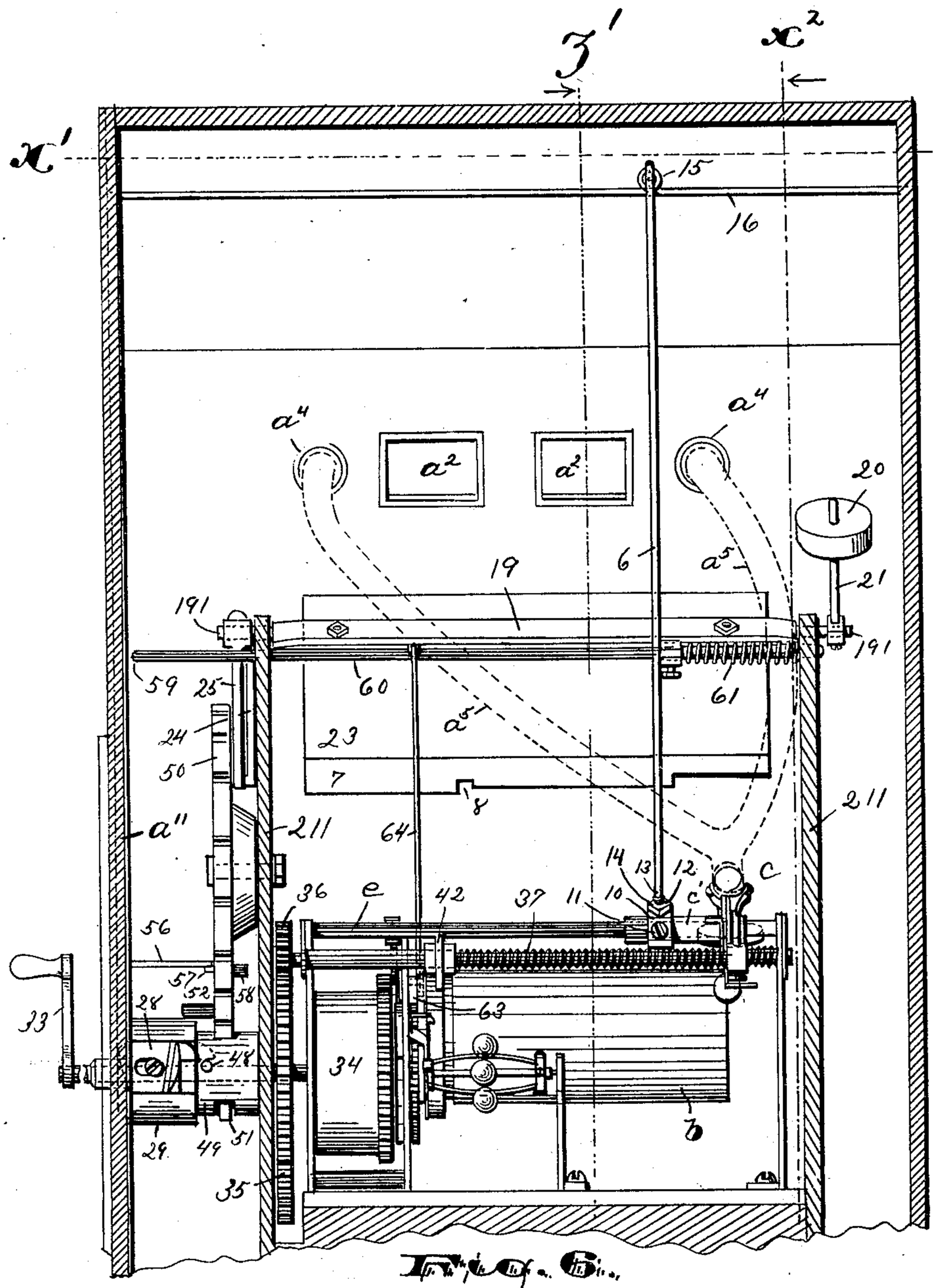

Fig. 6.

WITNESSES:

Harry A. Krug

Russell M. Everett.

INVENTOR:

Harold C. Matthews.,

BY

Drake & Co.

ATTORNEYS

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H. C. MATTHEWS.

COMBINED TALKING AND PICTURE EXHIBITING MACHINE.

(Application filed June 27, 1900.)

(No Model.) 5 Sheets Sheet 3.

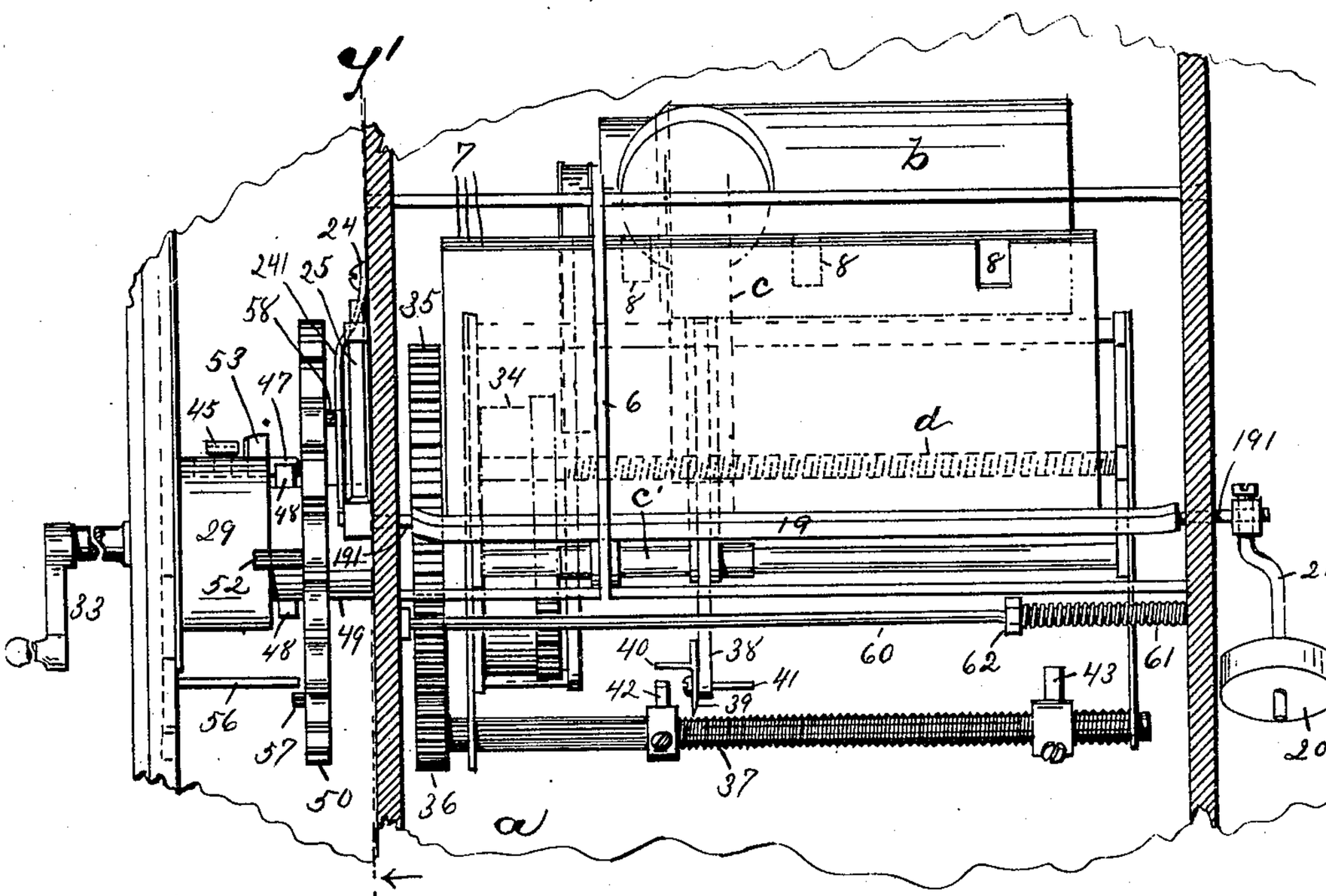

Fig. 7.

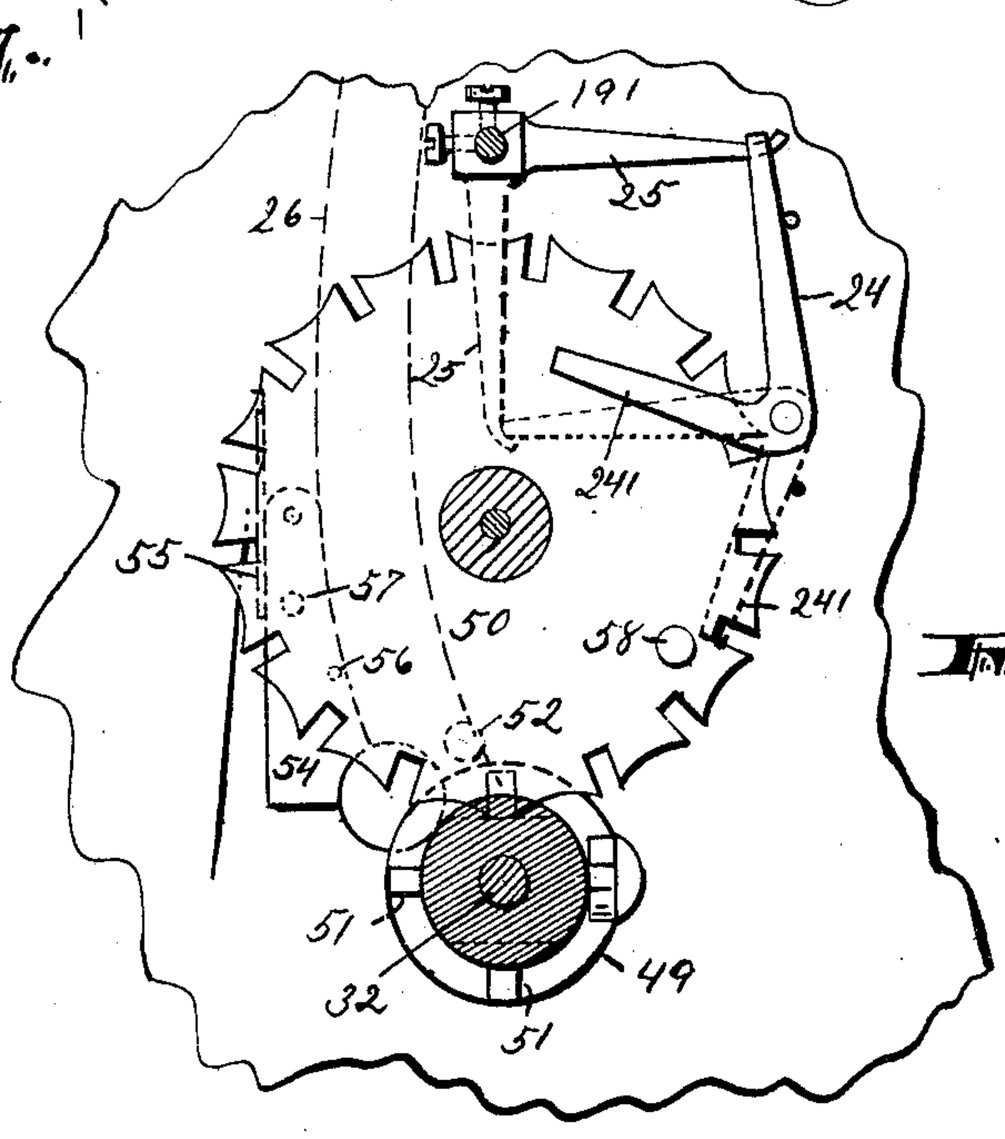

Fig. 8.

WITNESSES:

Henry Orrig

Russell M. Everett.

INVENTOR:

Harold Clark Matthews.

BY

Drake & Co.

ATTORNEYS.

No. 678,890. Patented July 23, 1901.

H. C. MATTHEWS.

COMBINED TALKING AND PICTURE EXHIBITING MACHINE.

(Application filed June 27, 1900.)

(No Model.) 5 Sheets—Sheet 4.

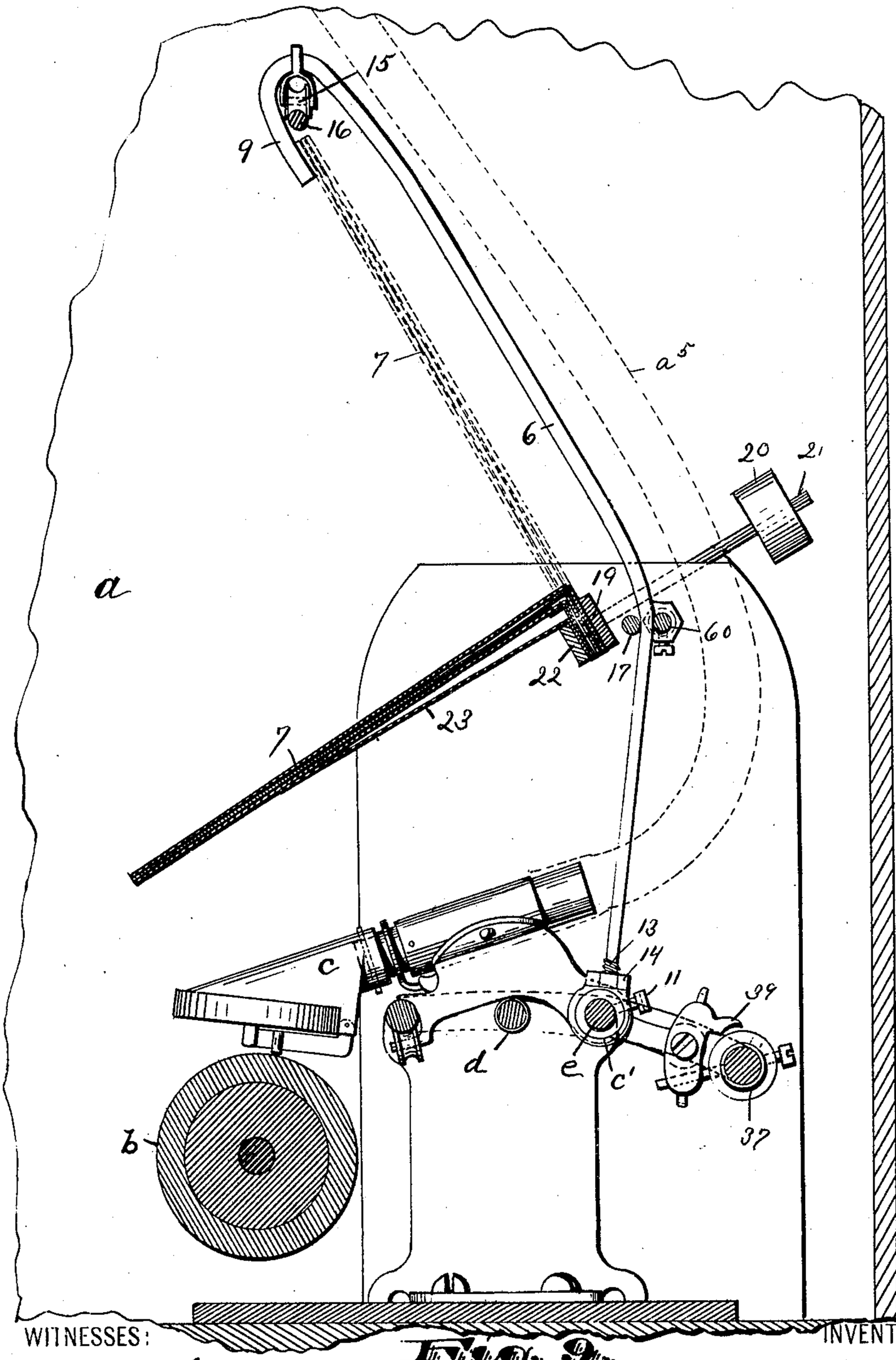

Fig. 9.

WITNESSES:

Henry Krug

Russell M. Everett.

INVENTOR:

Harold C. Matthews.

BY Drake & Co.

ATTORNEYS

No. 678,890. Patented July 23, 1901.

H. C. MATTHEWS.

COMBINED TALKING AND PICTURE EXHIBITING MACHINE.

(Application filed June 27, 1900.)

(No Model.) 5 Sheets—Sheet 5.

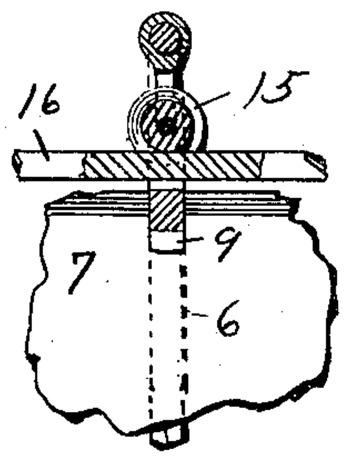

Fig. 11.

Fig. 10.

WITNESSES:

Henry Orth

Russell M. Everett

INVENTOR:

Harold C. Matthews,

BY Drake & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

HAROLD C. MATTHEWS, OF POTTERSVILLE, NEW JERSEY.

COMBINED TALKING AND PICTURE-EXHIBITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,890, dated July 23, 1901.

Application filed June 27, 1900. Serial No. 21,704. (No model.)

To all whom it may concern:

Be it known that I, HAROLD C. MATTHEWS, a citizen of the United States, residing at Pottersville, in the county of Hunterdon and State of New Jersey, have invented certain new and useful Improvements in a Combined Talking and Picture-Exhibiting Machine; 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 characters of reference marked thereon, which form a part of this specification.

The objects of this invention are to enable the songs or speeches of graphophones or other talking-machines to be illustrated by visible pictures successively brought into view as the song or speech progresses, the said pictures being brought into view automatically one after another by the same source of motive power as that which operates the sound-producing devices; to secure such a result by the employment of simple and inexpensive operating means; to secure a prompt timing of the pictures so that the said pictures will appear to view while the subject illustrated by said pictures is being expressed by the speaking devices, and to secure other advantages and results, some of which may be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved machine for simultaneously producing linguistic sound and visible illustrative pictures and in the arrangements and combinations of parts of the same, all substantially as will be hereinafter set forth, and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like characters of reference indicate corresponding parts in each of the several views, Figure 1 is a perspective view of my improved device. Fig. 2 is a side elevation of the same. Fig. 3 is a sectional detail taken at line x, Fig. 2. Fig. 4 is a sectional detail taken on line y of Fig. 3 looking in the direction of the arrow on said line. Fig. 5 is a section taken on line z of said Fig. 3. Fig. 6 is a rear elevation of the device, the rear part of the case being removed to show the working mechanism more clearly. Fig. 7 is a section of the same, taken on line x' of Fig. 6; and Fig. 8 is a view taken through line y', Fig. 7, on an enlarged scale and looking in the direction indicated by the arrow. Fig. 9 is a view taken on line z' of Fig. 6, and Fig. 10 is a section on line x^2 of Fig. 6. Fig. 11 is a detail sectional view on line y^2, Fig. 10.

In said drawings, a indicates a suitable case, box, or inclosure, preferably elevated on legs a' and provided at the front with stereoscopic lenses a^2 and an eye guard or shade a^3, adapted to prevent the light-rays entering the eyes from the sides, whereby a more perfect view of the pictures through the lenses a^2 may be obtained. At the sides of the said lenses and guard are phonographic ear trumpets or tubes a^4, all of which may be of any suitable construction convenient to permit the eyes and ears to simultaneously receive the light and sound waves to the best advantage. Within said case is arranged a graphophone or other machine for producing such sounds as are produced in talking, singing, or the like, and also a series of pictures and means for presenting the said pictures one after another to the eyes, said pictures being either photographs, lithographs, or pictures produced by any of the known methods of picture-making. The graphophone is preferably provided with the usual cylinder or record-carrier b and speaker or sound-reproducer c, which last is caused to travel upon a rod e in a direction parallel with the axis of the said cylinder or record-carrier by means of a screw d in any usual manner. With the said speaker or reproducer c the trumpets or ear-pieces a^4 are connected in any suitable manner, as by tubes a^5. In connection with the said speaker is arranged a traveling stay 6, adapted to hold the pictures 7 away from the line of vision until brought into coincidence with certain slots or passages 8 in or of said pictures, the said stay being arranged in the preferred construction as shown in Fig. 10, where the said stay is shown to be hook-shaped at its upper end, the hook 9 being turned forwardly, so as to lie in front of the said pictures 7. To hold the said stay in place, the speaker c is provided on its usual tubular extension c' with a collar 10, which is set at any desirable ad-

justment by means of a set-screw 11, the said collar being preferably provided with a threaded socket 12 at its upper side, into which the correspondingly-threaded lower extremity 13 of the stay is inserted. To prevent the stay from turning in said socket 12, and thus being thrown out of the proper adjustment at its hooked end, I have provided a lock-nut 14, although any other suitable means of accomplishing the same result may be employed. To secure greater positiveness of movement at the upper extremity of the stay, whereby the hooked end 9 will be to a greater extent prevented from vibrating because of the elasticity or flexibility of the wire-like stay, I may employ in connection with the hooked end a trolley-wheel 15, which runs upon a wire or rod 16, arranged horizontally at the upper part of the case or chamber. The stay-rod 6 may further, for greater security, slide between a horizontal guide-rod 17 and a rod 60, hereinafter described, for closing the slot against the entrance of coins during the operation of the machine.

Upon a horizontal carrier or rod extending across from side to side of the case in front of the stay 6 is hinged or pivoted a series of pictures 7, arranged after the fashion of the leaves of a book, the free ends of the pictures extending upward at a forward incline, as shown in Fig. 10, and at their edges lying within the hook 9 and being held in their forwardly-inclined positions thereby. The said leaves are provided with a series of notches 8, which are adapted to be brought one after another into coincidence with the depending finger 9 of the hook as the latter travels laterally with the speaker. The said notches do not coincide with one another, but are located in the free edges of the leaves, one a little away from the next in order, so that the hooked stay will be compelled to travel a greater or less distance from one slot before being brought into coincidence with the second slot in order. This allows the sound-producing device to make progress in rendering the story or song before the second picture will be brought into sight, thus giving full opportunity to the observer and listener to examine a first picture in the series and recognize or understand its relation to the subject of the song or story before it is covered up and a second picture displayed. The series of pictures are arranged on a carrier comprising a flat rod or bar 19, having journals 191 at opposite ends, which rest in suitable bearings in walls 211 of the case or framework of the machine.

Under some conditions the middle portion of the carrier to which the pictures are attached may be bent out of the axial line of the journals to secure an eccentric action, as shown, and in any event at one end of the carrier and preferably outside its bearing is arranged an arm 21, having an adjustable counterbalance-weight 20, adapted to raise the pictures to their normal elevated or inclined positions by rotating the carrier. The said pictures each comprise the body portion and a backing, the two being united by a flexible muslin, so as to secure the desired hinge action referred to, although the connection of the backing and body may be otherwise secured. The series of backings are clamped against one side of the carrier-bar 19 by a clamping-strip 22, and at the forward or lower side of the series is arranged a bent plate 23, which is also clamped in position by the strip 22 and lies against the forward or lower sides of the series of pictures, so as to support the said series while the same are being exposed to view and to raise said series to their normally-elevated position under the power of the weight 20 after all the pictures have been exposed. The first card of the series next the said plate 23 is a master-card and serves to cover the notches in the other cards while the stay is being returned to its initial position, said master-card being itself notched near its end to permit it to escape from the hooked stay after all the notches in the picture-cards have been passed by the returning stay. The stay then moves forward again and releases the pictures one by one as their notches are reached.

Preliminary to operating the machine the cards lie in a lowered position supported by the plate 23, and the plate and carrying-bar are held in their normal positions with the weight 20 elevated by the arm of a bell-crank 24, arranged upon the frame, and which engages an arm 25 on the picture-carrier secured at the end thereof opposite that carrying the weight. When the said arm 25 of the carrier is released from the said bell-crank 24 by the insertion of a coin and the turning of a crank and connection hereinafter described, the weight 20 is allowed to gravitate to raise the series of pictures to their elevated and inclined positions, as shown in Fig. 10. At this point of time the cards are so disposed with relation to the hook that the hook clears the side edges of the cards; but upon the turning of the crank above referred to the said hook travels backward into holding relation with the master-card, so that later when the holding-plate is lowered the leaves will retain their elevated positions, with their free edges above the lower extremity of the depending finger of the hook. To raise the said cards to their elevated positions and bring the parts into position to be presented to view upon the insertion of the coin in the slot, I have provided mechanisms (shown in Figs. 3, 4, 5, and 6) comprising a coin-guide 26, adapted to receive the coin as it is passed through the slot 27 and guide the same to a key 28, arranged upon a barrel 29 on a crank-shaft 30. The said crank-shaft is journaled in suitable bearings formed in the walls a^{11} and 211 of the frame or casing and consists of two independent sections 31 32. One end of the crank-shaft projects from the case and receives a crank 33, while at the other end is

the usual power-spring in a drum 34 and serving to actuate the graphophone in any usual manner. Back from said drum 34 is a gear-wheel 35, fast on the shaft and meshing into smaller gear-wheel 36 on a screw-shaft 37, which upon turning the crank 33 to wind up the machine preliminary to its operation automatically returns the speaker *c* to its initial position. To effect this return of the speaker, the usual trigger 38 for throwing the speaker into contact with the cylinder is provided at its rear end with a knife-edge 39, adapted to set into the thread of the screw-shaft 37 when the speaker is tipped up away from the cylinder. Said knife-edge is provided at opposite lateral sides with projecting arms 40 41, adapted to be engaged by coöperating rotary arms 42 43, fast on the screw-shaft at suitable points to automatically cause the knife-edge to engage and disengage the screw-shaft. At the same time said knife-edge is engaged with or disengaged from the screw-shaft the speaker is raised or lowered with respect to the cylinder. The outer section 31 of the crank-shaft carries the barrel 29, keyed thereto, and at one side of said barrel is a longitudinal slot or recess in which works the sliding key 28. Said key at one end lies partially in or across the coin-guide 26 and is provided with a beveled or oblique end bearing 44, Fig. 3, which is adapted to impinge upon the coin as turning of the crank is commenced, so that the key is slid longitudinally upon its guide-screw 45, working in a slot 46. This movement of the key 28 causes a tooth 47 on the inner end of the key to engage a spoke 48 on a roller or gear-wheel 49, so that as the turning of the crank continues the roller turns therewith. Said roller 49, moreover, transmits motion to a large wheel 50 by means of teeth or pins 51 on the roller engaging peripheral notches or teeth on the wheel 50. The said roller 49 and large gear-wheel 50 are so proportioned in size and number of teeth that one revolution of the large wheel 50 winds up the instrument ready for a performance, and therefore a pin or finger 52 is disposed upon the side of said large wheel, which at the completion of a revolution engages an incline 53 on the inner end of the key 28 and forces said key outwardly away from engagement with the spokes of the roller 49. This disconnects the two sections of the crank-shaft, and the crank now turns idly and may be freely rotated in either direction without effect. The coin lies in the lower end of the guideway 26 during the winding operations, so as to guard against any inadvertent escape of the key from engagement with the spokes of the roller 49, the edge of the coin resting at the lower side against a hinged portion 54 of the wall of the guideway. This hinged portion is normally held in line with the other walls of the slot by a spring 55, but is provided with an arm 56, which just before the revolution of the large wheel 50 is completed is engaged by a stud 57 on said large wheel, whereby the hinged portion 54 is swung outward against the power of the spring 55. This allows the coin to drop into a suitable receptacle, so that it is out of the way of the returning key. Another pin or stud 58, projecting at the opposite side of the large wheel 50, serves to operate the bell-crank 24, before referred to, which restores the pictures or cards to elevated positions. This stud 58 releases the lower arm 241 of the bell-crank as soon as the large wheel starts to turn and permits the weight 20 to at once restore the pictures to elevated position while the hooked stay is at the limit of its movement. As the toothed wheel completes its rotation the pin 58 again draws down the arm 241 of the bell-crank lever against the power of the weight and tips the plate 23 into its downward position, the hooked stay now preventing the cards from falling. The coin slot or guideway 26 is after the entrance of a coin closed against other coins by the end 59 of a sliding rod 60, said rod having bearings in the walls 211 211 of the supporting-frame and being normally held in locking position by a spiral spring 61. To provide for a releasing of this stop at the proper time for inserting a coin, the stay 6 as it nears the end of its range of movement engages a shoulder 62 on the rod and forces it away from the slot against the spring. This permits a coin to be put in; but as soon as winding begins the stay releases the rod and the guideway is closed.

To prevent operative movement of the graphophone parts before winding is completed, a stop-pawl 63 is provided for one of the main gear-wheels of the graphophone, and said pawl is connected by a rod 64 to a portion of the picture-carrier bar 19 which is out of the axial line of the journals 191 191, and therefore has an eccentric motion. Thus when the pictures are tipped up after the song is ended and just as winding commences the rod 64 is slackened and the pawl 63 applied either by gravity or suitable springs. The graphophone parts are therefore locked against operation while winding progresses, and at the end of winding when the picture-plate 23 is tipped down again, as hereinbefore described, the rod 64 is drawn upward and the pawl 63 released, allowing the action of the phonograph to begin.

The operation and sequence of movement of the machine is as follows: As the machine stands idle at the end of a performance the stay 6 is at its limit of movement farthest from the crank 33 and is holding the stop-rod 60 away from the coin-guideway 26. The picture-cards have all fallen down, and the weight 20 is held elevated by the engagement of the pin 58 with the arm 241 of the bell-crank 24. The pawl 63 is raised; but as the machine is run down there is no action. The speaker remains in contact with the cylinder, and the rear knife-edge 39 is above the screw-shaft 37; but the lateral arm 41 lies in the path of the rotary arm 43. The key 28 is slid out of

contact with the spokes 48, and the two sections of the shaft are thus disconnected, and the crank-handle 33 may be turned idly in either direction without effect. Upon inserting a coin in the slot 27 it drops to the bottom of the guideway 26 and upon turning the crank 33 forces the key 28 inwardly into engagement with the spokes of the roller 49, so that the inner shaft-section 32 begins to turn with the outer and wind up the spring within the drum 34. At the same time the large wheel 50 starts and the pin 58 releases the bell-crank 24, permitting the weight 20 to elevate the picture-cards. This also drops the pawl 63 to lock the phonograph parts against action. Also as soon as winding begins the screw-shaft 37 turns, and its arm 43 strikes the lateral arm 41 of the speaker-trigger and raises said speaker away from the wax cylinder *b* and feeding-screw *d*, at the same time bringing the knife-edge 39 into the screw-thread of the shaft 37. The speaker now travels backward and at its starting releases the rod 60, which immediately closes the coin-guideway. As the winding approaches completion the pin 58 on the large wheel 50 again engages the bell-crank 24 and gradually raises the weight 20 and lowers the plate 23. The completion of this action marks the completion of winding, and the machine is automatically started by the raising of the pawl 63 and the engagement of the rotary arm 42 on the screw-shaft 37 with the lateral arm 40 of the speaker-trigger, whereby the knife-edge 39 is raised from the screw-shaft 37 and the speaker dropped onto the wax cylinder and feed-screw. Immediately upon these actions the pin 52 on the large wheel 50 disconnects the key 28, the coin having previously been released by engagement of the stud 57 on the said wheel and the arm 56 of the hinged portion 54 of the guideway. The speaker then travels along the cylinder, and the stay 6 releases the pictures as desired, and when the performance is nearly ended the stay engages the stop-rod 60 and carries it out of the coin-guideway to admit another coin.

Various modifications of detail construction may be made without departing from the spirit and scope of the invention, and I do not wish to be limited by the positive descriptive terms employed, except as the state of the art may require.

Having thus described the invention, what I claim as new is—

1. The combination with a graphophone having the speaker *c*, of a stay carried by said speaker and comprising an upwardly-extending rod turned or hooked at its end, and a series of picture-cards pivoted at one edge and adapted to be held at the other edge in elevated position by said stay, substantially as set forth.

2. The combination of a graphophone or other talking-machine, a series of picture-cards hinged at one edge, a support on which said picture-cards may lie across the line of vision, means for tipping said cards up out of the line of vision, and a stay carried by the speaker of the graphophone and adapted at its upper end to engage the free edges of the cards and hold them in elevated position, substantially as set forth.

3. The combination of a graphophone or other talking-machine, having a traveling speaker, a series of picture-cards secured at one edge to a pivoted support, a weight normally holding said support elevated, a shaft with a spring thereon for actuating the graphophone and means for turning said shaft to wind up the spring, tripping means connecting said shaft and pivoted picture-support, and a stay carried by the graphophone-speaker and adapted to retain the picture-cards in elevated position independent of their support, substantially as set forth.

4. In a combined talking and picture-exhibiting machine, the combination of the pivoted picture-support having a projecting arm, a bell-crank lever engaging at one arm said projecting arm of the picture-support, an actuating-spring and winding-shaft for the machine, and a disk or wheel geared to said shaft and adapted to trip the second arm of the bell-crank lever to operate the picture-support as the spring is wound up, substantially as set forth.

5. The combination with the weighted picture-support 19, having pivotal ends 191,191, and the main shaft 30, of a rigid arm on one of said pivoted ends 191, a bell-crank lever 24, one arm of which engages with the said rigid arm, and a disk or wheel 50, geared to the main shaft and having a pin adapted to engage the second arm of the bell-crank lever for a portion of its revolution, and move the same, substantially as set forth.

6. In a combined picture-exhibiting and talking machine, the combination of a graphophone receiving power through suitable gear-wheels, a series of picture-cards arranged upon a pivoted support, means for giving said support an angular movement, a rod eccentrically connected to said support, and a pawl at the other end of said rod adapted to engage the gear-wheels of the graphophone, substantially as set forth.

7. In a combined picture-exhibiting and talking machine, the combination of a graphophone or the like, a series of picture-cards pivotally supported and adapted to swing like the leaves of a book, a holder for the free edges of said picture traveling with the speaker of the graphophone, a rotating screw-shaft for automatically returning said speaker to initial position, a brake or detent for the graphophone and connected to the series of picture-cards, and means for swinging said pictures through their angular range of movement, substantially as set forth.

8. In a combined talking and picture-exhibiting machine, the combination of a speaker or sound-producer adapted to travel

longitudinally of a record-cylinder, a series of superposed picture-cards hinged at their edges, and a stay carried by the said speaker or sound-producer and grasping the free edges of the picture-cards and normally holding them out of the line of vision, said free edges of the picture-cards being stepped or recessed at suitable points whereby they will be released when the stay moves to coincide with said points, and allowed to fall into view, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 2d day of May, 1900.

HAROLD C. MATTHEWS.

Witnesses:

CHARLES H. PELL,

C. B. PITNEY.