

J. I. GEMMILL.
 AUTOMATIC MULTIPLE RECORD PHONOGRAPH.
 APPLICATION FILED SEPT. 22, 1905.

925,430.

Patented June 15, 1909.

4 SHEETS—SHEET 1.

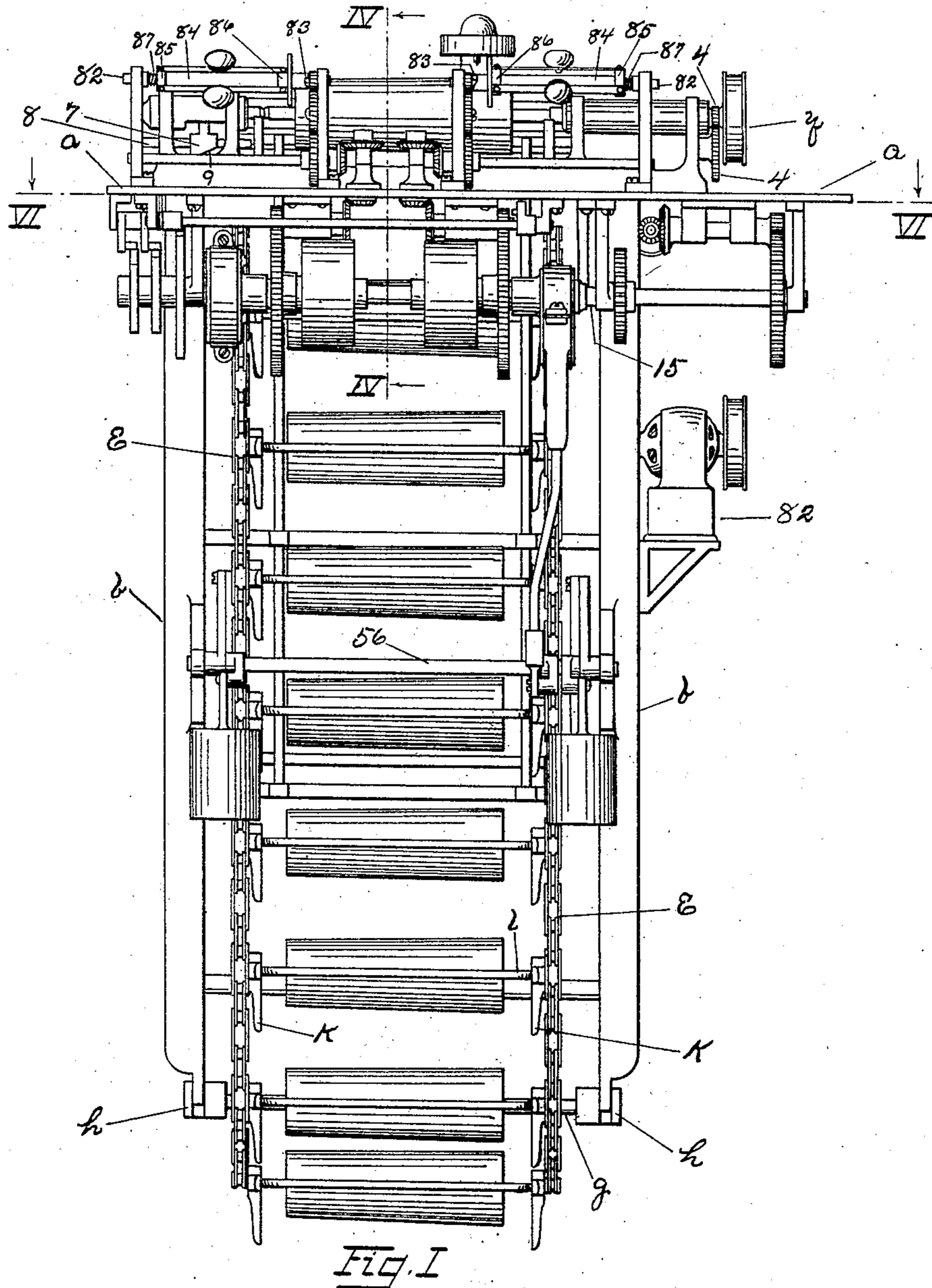


Fig. I

Witnesses:
 F. C. Valentini
 Leta M. Gemmill.

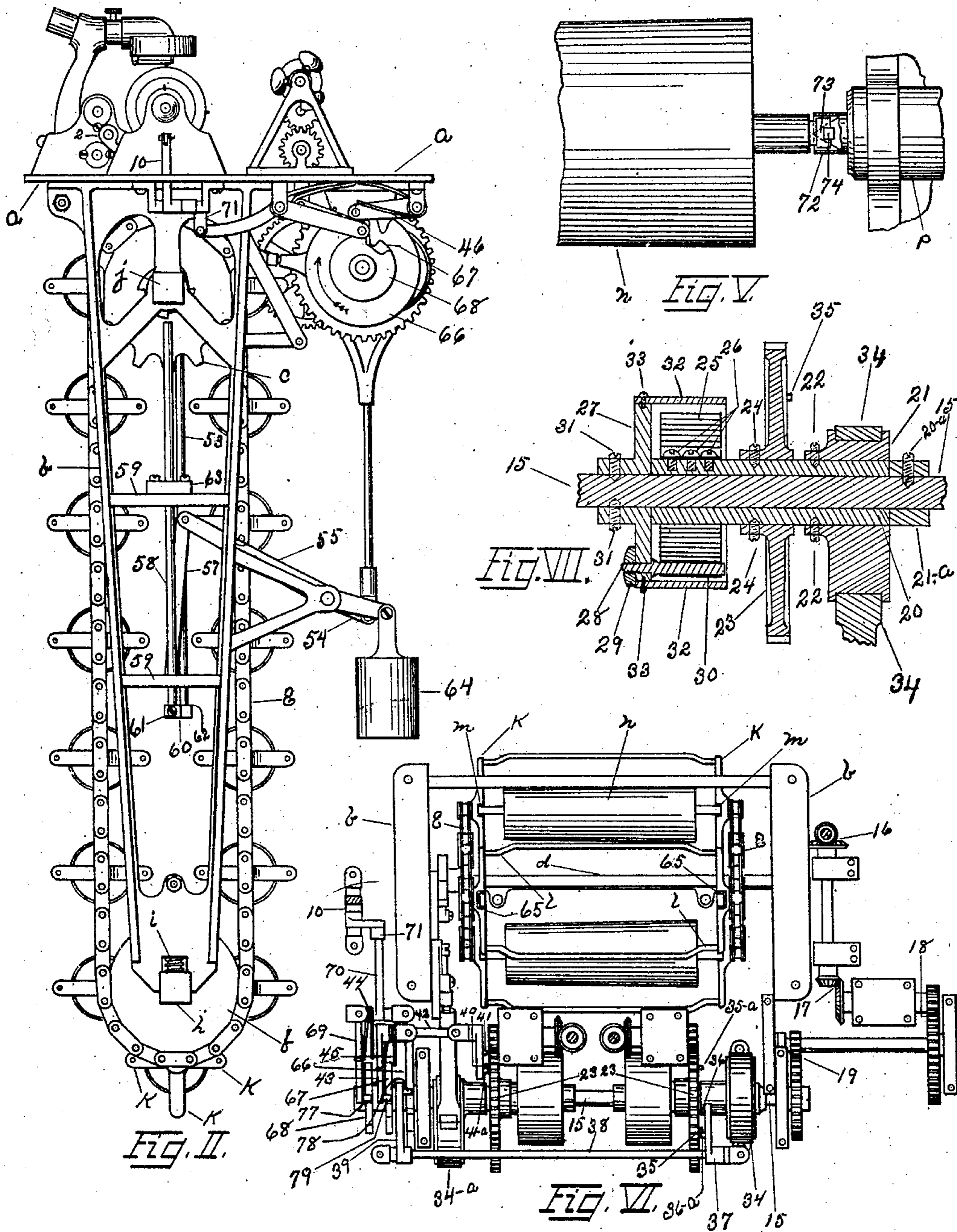
Inventor,
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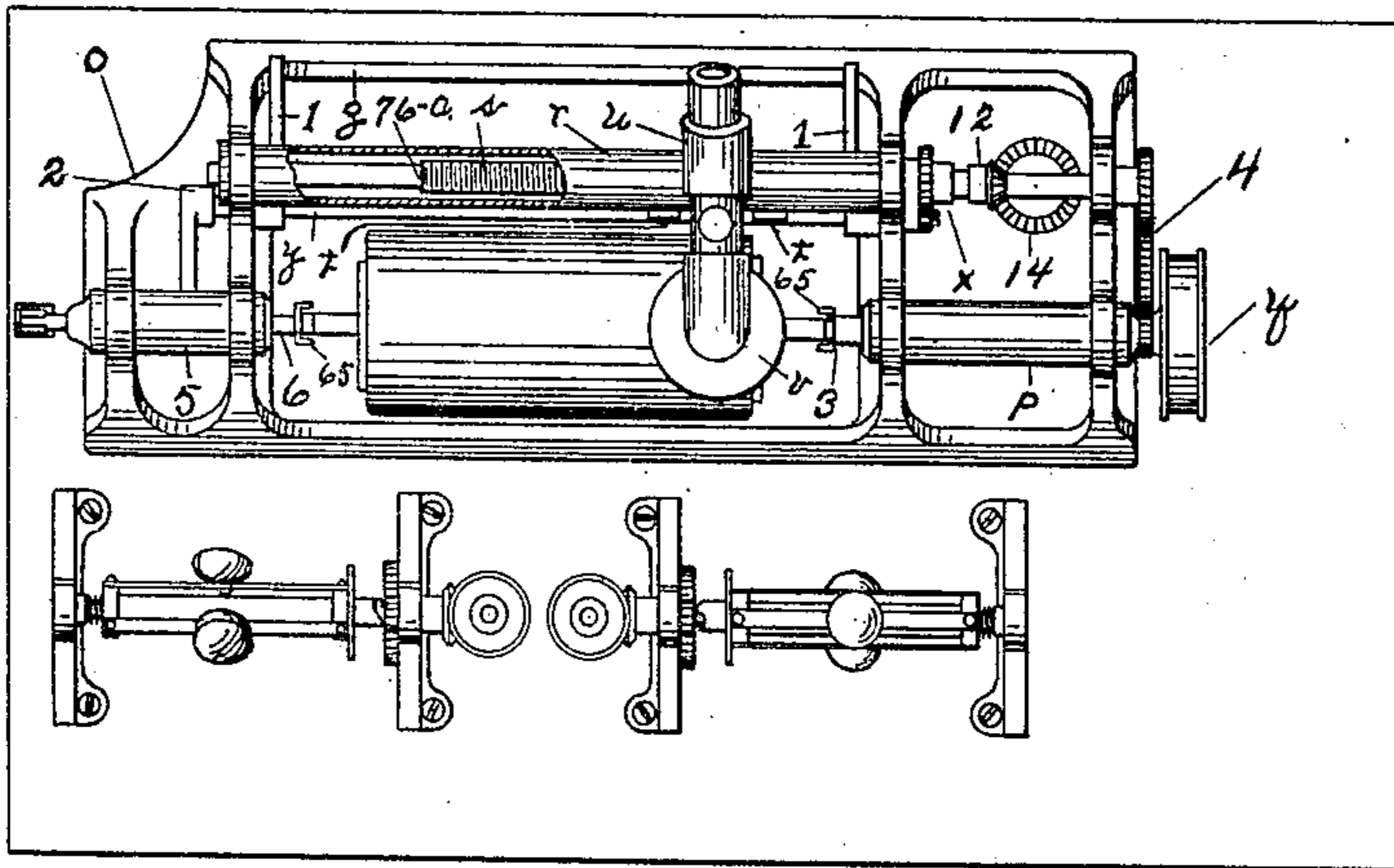


FIG. III.

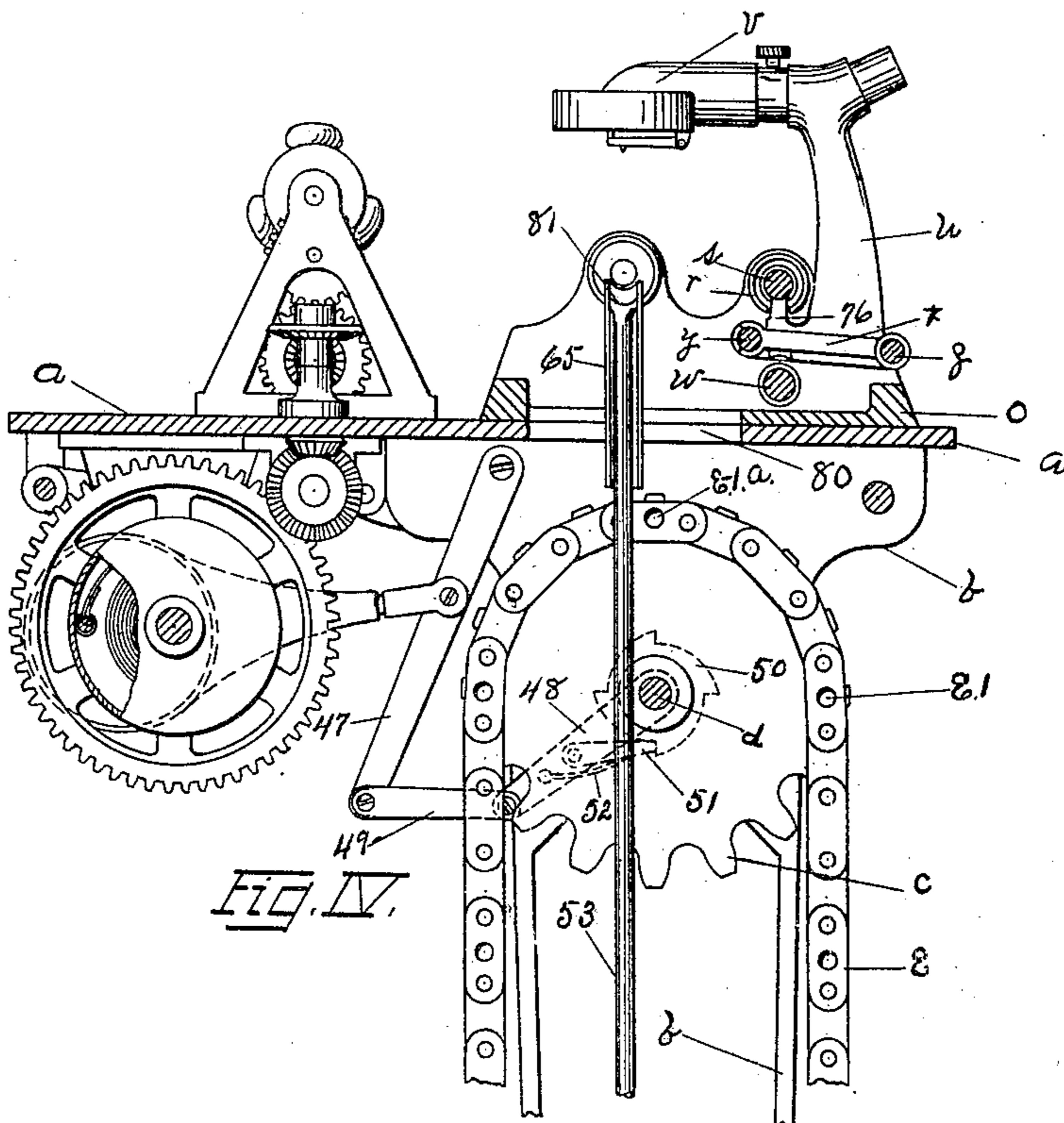


FIG. IV.

Witnesses:
 F. C. Valentin
 Leota M. Gemmill.

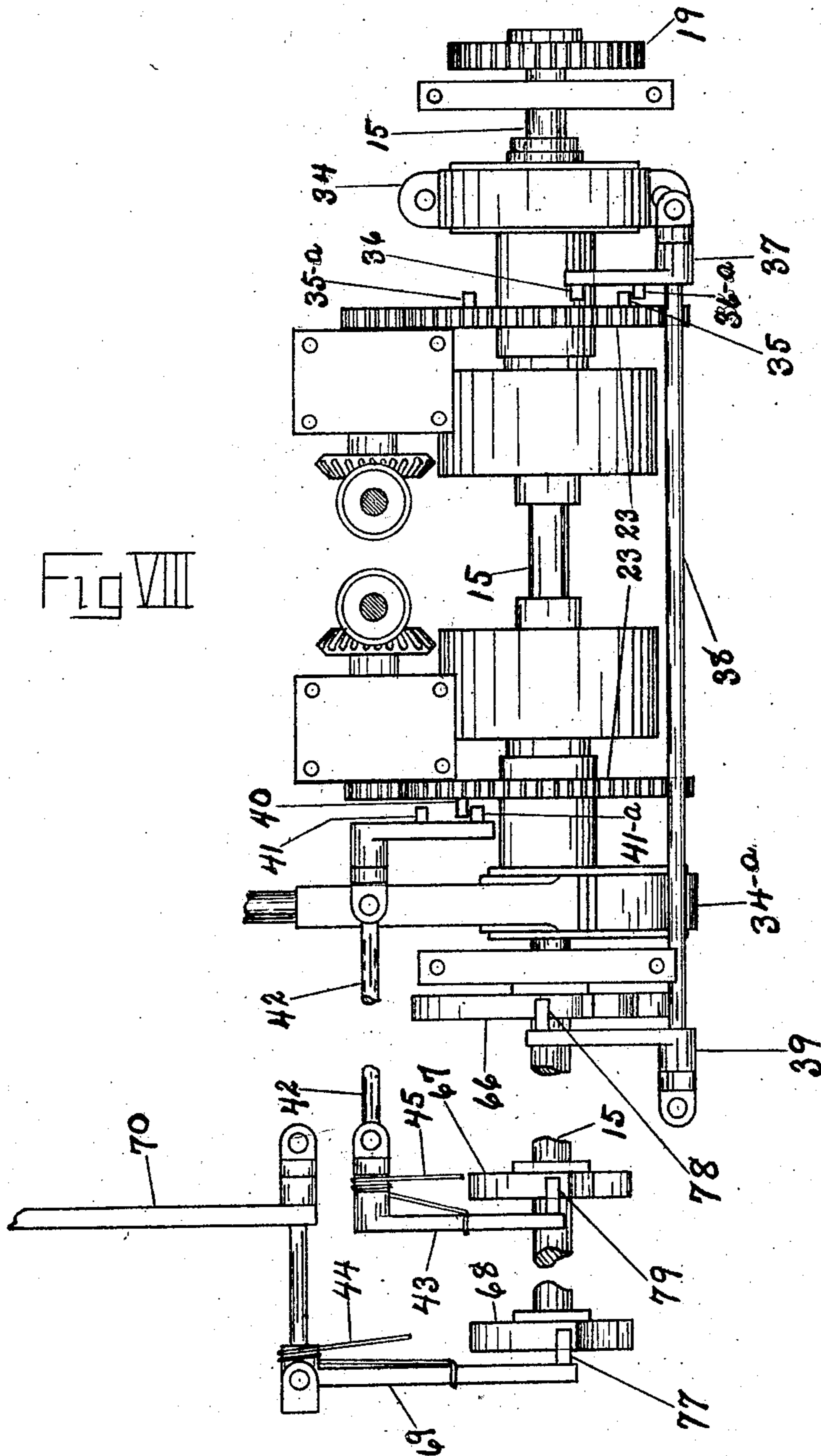
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 4 SHEETS—SHEET 4.

FIG VII



WITNESSES:
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UNITED STATES PATENT OFFICE.

JAMES I. GEMMILL, OF CLEVELAND, OHIO.

AUTOMATIC MULTIPLE-RECORD PHONOGRAPH.

No. 925,430.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed September 22, 1905. Serial No. 279,647.

To all whom it may concern:

Be it known that I, JAMES I. GEMMILL, a citizen of the United States, resident of Cleveland, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Automatic Multiple-Record Phonographs, of which the following is a specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

My invention relates to automatically-operated mechanisms and particularly to an automatic multiple-record phonograph.

The object of said invention is to produce a talking machine of the character described which shall be continuous in its action and shall operate for the purpose of repeating a complete discourse or speech of an indefinite length and impressed on a series of tablets or phonographic records manipulated automatically by the machine without any attention or attendance in any way by the operator. In carrying out this, my object, I have introduced novel mechanical features in the preferred forms of the different mechanisms comprising the machine, which will be hereinafter fully illustrated and described, and completely set forth in the appended claims. These results are obtained by the mechanism illustrated in the accompanying drawings, which form a part of these specifications.

Referring to the drawings: Figure I is a vertical view of the machine as seen from the rear. Fig. II is a vertical side view of the machine looking at the left-hand side, as in Fig. I. Fig. III is a top view of the machine above lines VI VI, Fig. I, showing the governor and a common form of a phonograph partly in section. Fig. IV is a sectional side view of a portion of the machine viewed through lines IV IV in Fig. I, looking at the left side. This figure shows the mechanism for rotating the sprocket wheels operating the chains on which are suspended the cradles supporting the record arbors; also shows the connecting of the governor to said mechanism and disclosing in section a portion of the clock-spring which operates same, together with a view of one of the rods which carry the record and its arbor from the cradle to a point between centers above the plate in which position the record is played. Fig. V is a

view of an arbor and a portion of the head or bearing containing the principal driving spindle and showing the chuck piece and its relation to the shaft bearing the arbor. Fig. VI is a view from the top with all of the mechanisms removed above lines VI VI, Fig. I, together with one of the arbors. Fig. VII is a section of one of the spring-driven eccentrics, together with one of the main escapement wheels, showing the construction of same and its relation to the shaft which is adapted to support and drive it; Fig. VIII is an enlarged view of the shaft 15 disclosing the relative positions of the levers and cams, also the detents used for intermittently starting and stopping the gearing operating the eccentrics to produce the several motions of the mechanism.

Similar characters refer to similar parts throughout the several drawings.

In a more particular reference to the drawings, in Fig. I, *a a* is a plate on which is placed the phonograph, together with the governors which govern the speed of the mechanism below the plate. Hereafter all of that mechanism which is sustained by and above the plate will be known as the upper part, and below it as the lower part. In Fig. I, which is the most complete disclosure of my device, *b b* shows the framework for the record elevating means. Fig. II serves to show how this frame is adapted to sustain the sprocket-wheels *c c*, one of which is shown and both being completely covered up by the proximity of the drawings in Figs. I and VI. These sprockets *c c* are mounted on a shaft *d*, Fig. VI, in such a manner as to make their teeth co-incident with each other while passing a given line parallel with the axes on which they rotate. On either of these two wheels is placed a chain, *e e*, the links of which are perforated on one side of the chain only, as at *e-1*, Fig. IV, and the chains are positioned on their respective wheels in such a manner as to bring the perforations on the inner sides of the chains and opposite each other. These chains, *e e*, are adapted to run over a pair of plain wheels, one of which is shown at *f*, Fig. II, said wheels being mounted on a shaft *g*, Fig. I, and adapted to a bearing *h h* at either end. Said bearings are grooved on either side and fitted to the slots in the bottoms of the frames *b b* and are slidable therein. Short spiral springs *i i*, one of which is shown in Fig. II, serve to keep a tension

on the chains and take care of all the slack in same, also any undue strain due to any slight eccentricity of the sprocket-wheels *c c* or the wheels *j f*. The sprocket-wheels and shafts are mounted in a pair of bearings, one of which is shown at *j*, Fig. II. These shafts are not shown as extending clear through their respective bearings, but are mounted therein in such a manner as to bring the sprockets and their respective idlers below into a perfect alignment, one with the other. The aforementioned perforations or holes *e—1* in the chains *e e* are uniformly spaced apart and in each of them is mounted the trunnion ends of a cradle, which is made up of small castings, one of which is shown at *k k k*, Fig. II, and which are held together by the two bent or formed wires *l, l*, Fig. VI. The inner sides of these two castings or ends, *k k k*, are slotted as at *m m*, Fig. VI, said slots being positioned in the castings so as to be equidistant from the two side wires *l l*, and extending downward below the pins serving as trunnions on which the cradle is hung; these pins being positioned centrally with regard to the horizontal position of said ends *k k k* as shown at the bottom of Fig. II and are riveted therein flush with the bottom of said slot. The function of this cradle is to hold a metal arbor end, Fig. VI, on which may be placed a standard cylinder record. The ends of the shaft on which the arbor is mounted are adapted to enter the slots *m m* in the cradle and rest therein at the bottom, below the level of the aforementioned trunnion pins, on which the cradle is supported on the chain by means of holes in the links of same. It is obvious that, owing to the center of gravity being below the trunnions, the cradle with its arbor therein will always retain its relative position or equilibrium through all of the phases of its progress in its orbit around the periphery of the sprockets and idlers.

The phonograph shown in Fig. III is of a common form but special design to conform to the requirements of the machine as a whole. In Fig. III, *o* shows a base, *p* is a long bearing through which is placed the principal driving shaft, adapted to rotate therein and which is driven by a belt wheel *q*. The innermost end of this shaft is equipped with a chuck 3, adapted to engage with the end of a record arbor and drive same. A dust-proof covering *r* is provided for a transverse screw *s*, which operates the carriage, a suggestion of which is shown at *t, t*, and which is further shown at *t* in Fig. IV. This carriage *t* serves to sustain the arm *u* with the reproducer *v*. A second screw, not shown in Fig. III, but sectionally shown in Fig. IV at *w*, is placed directly below the screw *s*, and is adapted to exert pressure and cause motion in an opposite

direction from that caused by the screw *s*. The two screws are connected by a gearing at *x*, Fig. III. The carriage *t* is adapted to slide on the two rods *y* and *z*, which are held in parallel relation to each other by the levers 1—1. The whole combination is adapted to move through a short arc, using the operating shaft *y* as a radius point. A lever 2 serves to impart motion to the shaft *y*. The shaft within the bearing *p* is connected to the screw *s* by means of the gears at 4, Fig. III. Another bearing at 5 contains a slidable center 6, which is connected to a block 7, Fig. I, through a slot in said bearing. The block 7 is attached to a slidable shaft 8, Fig. I, and is cut away at 9 so as to present an incline plane or surface, which is adapted to engage the end of the lever 2, Fig. III. The shaft 8, Fig. I, is attached to the bell-crank 10, Fig. II, and the whole is operated thereby in such a manner that when the center 6 is withdrawn the lever 2 operates the rod of shaft *y* and the levers 1—1, together with the rod *z* and the carriage *t* to disengage the nut 76, Fig. IV, from the screw *s* and engage the same with the screw *w*, immediately after said disengagement. The bevel gears at 12 and 14, Fig. III, serve to transmit motion to the shaft 15, Fig. I, by means of the intermediate gears and respective shafts shown at 16, 17, 18, and 19, in Fig. VI. This shaft 15, Figs. I, VII and VIII, serves to carry the power-springs and driving eccentrics for the actuating mechanism essential to the operation of the sprocket-wheels and chains, also the elevator to elevate a record arbor from the said chains to a point between centers.

In Fig. VII, the shaft 15 serves to sustain a loosely fitting sleeve 20, on which is placed an eccentric 21, which is attached to said sleeve by set screws 22 22, the main escapement wheel 23 being attached to the sleeve also by means of set screws 24 24. A clock-spring 25 is shown attached by means of screws to the same sleeve at 26, a plate 27 carrying a stud 28 attached to said plate and held in position by the nut 29, serving to engage the outermost end of the clock-spring 25 as shown at 30. The plate 27 is attached permanently to the shaft 15 by set screws 31 31 and a barrel 32 32 is attached to said plate on its periphery by means of screws 33 33 and serves as a protection of the aforementioned clock-spring. It is obvious that the shaft 15 being always in motion it will have a tendency to wind up the springs and when released, the wheel 23 and eccentric 21 will move forward performing their work. The eccentric bands are shown at 34 34. The lug 35 on the wheel 23 serves to operate as a detent for the mechanism and is adapted to act against a similar lug 36 on the lever 37, Figs. VI and VIII. This lever is operated by a shaft 38 and accompanying lever 13

39. The lug on wheel 23 shown at 35^a is identical with the lug 35, but diametrically opposite; so that this wheel is stopped twice in one revolution and in consequence will make only half of a revolution at a time. Lugs 40 and 41 are identical with lugs 35 and 36 and the lever to which lug 40 is attached is operated by the shaft 42 and lever 43. Springs 44 and 45, Figs. VI and VIII, and spring 46, Fig. II, serve to maintain a pressure on levers and shafts and keep them at their normal positions at all times, while in motion. The eccentric 34^a serves to operate the levers 47 and 48, Fig. IV, by means of a link 49. The lever 48 is attached to and moves freely on the shaft *d*, operating a ratchet-wheel 50 by means of a pawl 51, said pawl being held in place by a spring 52. The ratchet-wheel 50 is secured to the shaft *d* and when operated by the spring-actuated eccentric and levers is adapted to move forward, carrying the shaft *d* but one-fourth of a revolution. This motion disposes of one record and brings up a new one as will be readily understood and made obvious by the spacing of the holes of the aforementioned chains as at *e*^a and *e*^{1a} in Fig. IV. The chain *e* and the sprocket *c* have been set back on the shaft *d* in Fig. IV in order to show the quartering of the circumference of the wheel *c* by the aforementioned perforations in the chains. The hole *e*^{1a} would more properly be just back of the rod 53. The eccentric 34 serves to operate the levers 54 and 55, Fig. II, which are sustained by the shaft 56 in Fig. I. The said levers serve to operate the elevator by means of links 57, Fig. II. The elevator is made up of rods 58, which serve as guides for the whole, and rods 53 which are the elevators in fact. The rods 58 are adapted to slide through pieces 59 59 and are attached at the bottom to a cross piece 60 being held therein by screws 61. The rods or elevator shafts 53 are attached to this cross-piece permanently at 62, and are adapted to slide through a cross-piece guide at 63. Counterbalancing weights 64, Fig. II, serve to give this system an equipoise when an arbor and record is on the elevator. In Fig. IV, a channel 65 is shown which is again shown in Figs. III and VI and which serves to guide the ends of the arbor shafts from the points *m m* in Fig. VI to and between point 6 and the chuck 3, Fig. III.

The shaft 15, Figs. VI and VIII has three circular plates permanently attached to it at its outermost end, said plates constituting cams and disclosed as 66, 67, and 68. These plates have irregular indentations in their respective edges of such a nature and shape as to give (while in motion) a performance of motion to the levers 39, 43, and 69, peculiarly adaptable to the performance of their several functions. The lever 69 operates

the lever 70, Fig. VI and by means of the link 71, Figs. II and VI, and the bell-crank 10, Fig. VI, serves to operate the shaft 8, carrying the block 7, Fig. I. The chuck piece on the shaft within the bearing *p*, Fig. III, is shown in detail in Fig. V, in connection with a broken elevation of a record and its arbor and shaft, the end of which, together with the chuck 3, is cut away showing sectionally the cup-shell 72 and its center 73. A square pin 74 is shown as passing clear through the cup 72, together with the center 73. The center is an ordinary 60 gedree one and is adapted to take the end of the arbor shaft by reason of it having its center reamed for that purpose. Across one end of the arbor shaft a square slot is cut which adapts it to engage with the square pin when the arbor shaft has been pushed well up on to the center, thereby engaging the arbor and rotating it. The speed of the shaft 15 compared with the speed of the main shaft is in the ratio of; as one is to a sufficient number of revolutions of said main shaft operated by the wheel *q* to successfully operate and play the longest possible record. The motor 82, Fig. I, is shown in place and is intended to be belted direct to the wheel *q*. The coin-slot and the conveyer, together with the switching device, are not shown, as they are common, and are well understood. It will appear obvious that this machine is intended to be inclosed in a cabinet as it is adapted to be suspended therein by means of the edges of the plate *aa*, although said arrangement, including the escapement wheels 23 23, Fig. VI, is supplied with a governor. Said governors are of a simple form and are connected with said escapement wheels 23—23 by gears as shown in Figs. I, IV, and VI. In Fig. I the governors shown on the plate *a* are identical and shaft 82 is supplied with a pin 83 which serves to engage with a ratchet tooth in the end of the sleeve 84, which is mounted loosely on the shaft so that it may rotate. The portion 85 is permanent to the sleeve and the portion 86 is slidable thereon, the springs and weights being attached thereto. A spiral spring 87 serves to hold the ratchet sleeve against the pin 83, so that when the gears come to a stop suddenly the governor will continue to revolve and thereby be spared the sudden jar due to an instant cessation of motion. It finally comes to a stop of its own accord.

The action of the machine is as follows: An arbor with its record being placed within centers, as in Figs. I and III, the motor being started, the reproducer being down so that the jeweled contact pin is in actual contact with the record, the reproducer starts over the record to play same. The cams are in position as in Fig. II and will rotate as

indicated by the arrow on cam 66. Upon the record having been played, the screw *s* Fig. III, will drop the nut 76, Fig. IV, at 76^a, Fig. III, and immediately after the cam 78, Fig. VI, will have advanced sufficiently to allow the pin 77 to drop into the indentation in said cam and allow the lever 69 to operate and withdraw the center 6, Fig. III, also operating the carriage *t*, Fig. IV, thereby disengaging the nut 76 from the smooth portion of the screw *s* at 76^a Fig. III, and engaging the same to the screw *w*, Fig. IV. This screw returns the carriage to the starting point and drops the nut in the same manner as at 76^a. When the center 6 was withdrawn the arbor and shaft fell into the channel guides 65 and rested on the elevator rods 53, Fig. IV. At this time the cams have advanced so that the cam 66, Figs. VI and VIII, allows the pin 78 to fall into the first of two notches in its edge, thereby operating the levers 39 and 37 to disengage the lugs 36^a and 35 and allowing the wheel 23 controlling the eccentric 34 to revolve, whence said wheel proceeds to make one-half revolution and to operate the elevator levers 54, 55, and 57, together with the elevator shafts 53 of Fig. II and thereby lower the record just played into its cradle ends. *k k k*, Fig. VI, the record and its arbor passing down through holes in the plate *a a* and base *o* at 80, Fig. IV. The lug 35^a comes around and engages the lug 36 on lever 37, thereby bringing the wheel 23 and the eccentric 34 to a stop. The pin 78 and the lever 39 are at this time being recovered from the bottom of the notch in the cam 66, Figs. VI and VIII, and when recovered fully they have operated on the lever 37 so as to disengage the lug 35^a from the lug 36 and allow it to advance to contact with lug 36^a from which position it is released to perform the latter half of this revolution at the proper time. Immediately with the lugs 35^a and 36^a coming into contact, the pin 79 on lever 43 drops into the notch on cam 67 and thereby releases the mechanism governing the eccentric 34^a. This eccentric makes one full revolution with the exception of the space between the lugs 41 and 41^a. The eccentric 34^a is set on dead-center when the lug 40 is midway between the lugs 41 and 41^a, and the resultant travel of the eccentric between the points or lugs 41 and 41^a is so slight as not to be noticed on the levers 47 and 48 or sprocket-wheels *c*. In making this revolution the eccentric 34^a operates the levers 47 and 48, Fig. IV, and thereby advances the series of records, thus displacing the record just played, and replacing it with a fresh one in position to be elevated. The pin 79, Fig. VI, is now being recovered from the bottom of the notch in cam 67 and the same results are obtained by lugs 40, 41, and 41^a as were shown by the action of the lugs 35,

35^a, 36, and 36^a. At this time the pin 78 in lever 39 falls into the second notch of the cam 66 and allows the wheel 23 and the eccentric 34 to complete their revolution, thereby elevating a new record to a point between center 6 and chuck 3, Fig. III. At this point the pin 77 in lever 69, Figs. VI and VIII, has commenced to advance out of the notch in cam 68 and thereby operates the levers connecting the bell-crank 10 through the intermediate shaft 8 and block 7, Fig. I, to the center 6, Fig. III, at once pushing the arbor and its shaft into the chuck 3 to operate same and releasing the reproducer so that it comes down and bears on the record,—the nut 76 engaging the screw *s* at the same time. At this instant the pin 78 on lever 39 has advanced and allowed the lug 35 to pass lug 36 and engage with the lug 36^a. The eccentric 34 is set so that this slight motion will advance it sufficiently to operate the elevator shafts slightly, thus withdrawing them downward from the arbor shaft as at 81, Fig. IV, thereby allowing the arbor shaft to rotate freely. It will be noted that the whole cycle of operations has thus been described, and that the displacing of each individual record from its position in the series and the carrying of the same into playing position upon the phonograph, the playing of the record, the replacing of the same in its position in the series, and the advancement of the series so as to bring another record into position to be displaced, involves the repetition of this cycle of operations.

This machine is essentially a coin-operated machine, but may be adapted to be operated by the usual motor and lever for starting and stopping same for home use.

I wish to particularly point out that some of the more important features involved in the operation of my invention and differentiating the same from the prior art as known to me, are as follows: (1) The series of records carried upon the chains *e*, or in the magazine, is advanced through a complete circuit and each record brought back to its original position in said series, during the operation of playing the whole series, each record, however, accordingly as it is played, being entirely displaced from the circular or elliptical path in which the series as a whole moves. (2) The series of records, between the playing of each two contiguous records, is positively advanced a uniform distance by means of the ratchet 50 the levers 47 and 48 and the mechanisms actuating the same and cooperating therewith. (3) The records of the series are uniformly spaced apart in the magazine and fill every position in the complete circuit through which the series moves. (4) The records successively are displaced from the series, carried into playing position upon

the phonograph, and then replaced in the series in the same position from which they were displaced. (5) Cylindrical records, together with their arbors and shafts, are
 5 bodily displaced from the series, brought into playing position upon the phonograph, and then replaced in the series.

Having thus described my invention in detail, that which I particularly point out
 10 and distinctly claim is:

1. In mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of records; means adapted to ad-
 15 vance the latter around a complete circuit; and means adapted to displace said records from said circuit into playing position upon said phonograph, and automatically operating mechanism for operating all of said
 20 means during a complete circuit of operation.

2. In mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor;
 25 of a series of records; means adapted to intermittently advance the latter around a complete circuit; and means adapted to successively displace said records from said circuit into playing position upon said phono-
 30 graph, and automatically operating mechanism for operating all of said means during a complete circuit of operation.

3. In mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor;
 35 of a series of records forming a complete circuit; means adapted to advance said series so that said records occupy successively each position in said circuit; and means
 40 adapted to displace said records from said circuit into playing position upon said phonograph, and automatically operating mechanism for operating all of said means during a complete circuit of operation.

4. In mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor;
 45 of a series of records forming a complete circuit; means adapted to intermittently advance said series so that said records occupy successively each position in said circuit; and means adapted to displace at a fixed po-
 50 sition said records from said circuit into playing position upon said phonograph, and
 55 automatically operating mechanism for operating all of said means during a complete circuit of operation.

5. In mechanism of the character described, the combination with a phonograph
 60 and suitable actuating mechanisms therefor; of a series of records, the latter positioned so as to fill every position in a complete circuit; means adapted to advance said series as a whole; and means adapted to bring said
 65 records into playing position upon said

phonograph, and automatically operating mechanism for operating all of said means during a complete circuit of operation.

6. In mechanism of the character described, the combination with a phonograph
 70 and suitable actuating mechanisms therefor; of a series of records so disposed that each two adjacent records are spaced apart uniformly, the whole forming a complete circuit; means adapted to advance said series;
 75 and means adapted to bring said records into playing position upon said phonograph, and automatically operating mechanism for operating all of said means during a complete circuit of operation.

7. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of records
 80 so disposed that each two adjacent records are spaced apart uniformly, the whole forming a complete circuit; means adapted to intermittently advance said series as a whole; and means adapted to bring said records into
 85 playing position upon said phonograph, and automatically operating mechanism for operating all of said means during a complete circuit of operation.

8. In mechanism of the character described, the combination with a phonograph
 90 and suitable actuating mechanisms therefor; of a series of records so disposed that each two adjacent records are spaced apart uniformly, the whole forming a complete circuit; means adapted to advance said series;
 95 and means adapted to displace said records from said circuit into playing position upon said phonograph, and automatically operating mechanism for operating all of said means during a complete circuit of opera-
 100 tion.

9. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of record
 110 arbors; positive means adapted to advance said series as a whole; and means adapted to bring said record arbors into playing position upon said phonograph.

10. In automatically-operating mechanism
 115 of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of record arbors; means for moving said phonograph and said series relatively to each other,
 120 whereby, during a complete relative movement, each record arbor lies adjacent to the said phonograph; and means adapted to displace said record arbors from the path traveled during such relative movement, into
 125 playing position upon said phonograph.

11. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of record
 130

arbors; means for intermittently moving said phonograph and said series relatively to each other, whereby, during a complete relative movement, each record arbor lies adjacent to said phonograph; and means adapted to successively displace said record arbors from the path traveled during such relative movement into playing position upon said phonograph.

12. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of record arbors; means for moving said phonograph and said record arbors relatively to each other, whereby, during a complete relative movement, each record arbor lies adjacent to said phonograph; and means for producing a relative movement of said phonograph and each record arbor, accordingly as the former and each successive record arbor, lie adjacent to each other, whereby the record arbor is brought into playing position upon said phonograph, said last-named movement being independent of the path traveled during the relative of said phonograph and said series.

13. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of record arbors; and means adapted to displace each record arbor from said series into playing position upon said phonograph, and to replace the same into position in the said series.

14. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanism therefor; of a series of record arbors; means intermediate, adapted to intermittently advance said series; and means adapted to displace at a fixed position each record arbor from said series into playing position upon said phonograph, and to replace the same in the same place in said series.

15. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of record arbors; means adapted to place said record arbors into a playing position upon said phonograph and to displace the same therefrom; and means adapted to advance said series, whereby each record arbor, during one complete movement of the series, occupies every position in the series, the movement of the record arbors onto and from the phonograph not forming a part of said complete movement.

16. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanism therefor; of a series of cylindrical records provided with suitable arbors

and shafts; means for moving said series; and means adapted to bodily displace said records and their arbors and shafts from their positions in said series into playing position upon said phonograph.

17. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of cylindrical records provided with suitable arbors and shafts; positive means for moving said series as a whole; and means adapted to bodily displace said records and their arbors and shafts from their positions in said series into playing position upon said phonograph.

18. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of cylindrical records provided with suitable arbors and shafts; positive means for moving said series as a whole; and means adapted to bodily displace said records and their arbors and shafts from their positions in said series into playing position upon said phonograph, said moving means and said displacing means performing their functions alternately.

19. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of cylindrical records provided with suitable arbors and shafts; positive means for moving said series intermittently; and means adapted to bodily displace said records and their arbors and shafts from their positions in said series into playing position upon said phonograph, and to replace the same in said series, one record being displaced and one record replaced between each two movements of said series.

20. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of cylindrical records provided with suitable arbors and shafts; positive means for moving said series intermittently; and means adapted to bodily displace said records and their arbors and shafts from their positions in said series into playing position upon said phonograph, and to replace the same in said series, one and the same record being displaced and replaced between each two movements of said series.

21. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of cylindrical records provided with suitable arbors and shafts; means for moving said series around a complete circuit; and means adapted to bodily displace said records and

their arbors and shafts from said circuit into playing position upon said phonograph.

22. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of cylindrical records provided with suitable arbors and shafts; means for intermittently moving said series; and means adapted to bodily displace said records and their arbors and shafts from a fixed position in said series into playing position upon said phonograph, and to replace the same in said series in the same position.

23. In mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of records; means adapted to intermittently advance the same by uniform distances around a complete circuit; and means adapted to move said records into playing position upon said phonograph and automatically operating mechanism for operating all of said means during a complete circuit of operation.

24. In mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of records; means adapted to intermittently advance the same by uniform distances around a complete circuit; and means adapted to move said records into playing position upon said phonograph, such last-named movement being independent of said circuit and automatically operating mechanism for operating all of said means during a complete circuit of operation.

25. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a base for said phonograph; a series of record arbors; means supported by said base and adapted to carry said record arbors; means adapted to intermittently advance said carrying means; an elevator having an operative movement between said carrying means and the playing position of the record arbors upon the phonograph and adapted to contact with said record arbors; and means for actuating said elevator.

26. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a base for said phonograph; a frame supported by said base; a series of record arbors; carrying means for the latter supported by the said frame; means adapted to intermittently advance said carrying means; an elevator having an operative movement between said carrying means and the playing position of the record arbors upon the phonograph, and adapted to contact with said record arbors to elevate the same to and lower the same

from said playing position between each two movements of said carrying means; and means for actuating said elevator.

27. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a base for said phonograph; a frame supported by said base; a series of record arbors; carrying means for the latter comprising a pair of shafts journaled in said frame, suitable sprocket-wheels supported upon said shafts, and chains engaging said sprocket-wheels and having record arbor-supporting means; means adapted to intermittently rotate said sprocket-wheels; an elevator having an operative movement between the playing position of the record arbors upon said phonograph and said carrying means, and adapted to contact with said record arbors to elevate the same to and lower the same from said playing position between each two movements of said sprocket-wheels; and means for actuating said elevator.

28. In automatically-operating mechanism of the character described, the combination with a phonograph; of means for driving same; a base for said phonograph; a frame supported on said base; a series of record arbors; means supported by said frame and adapted to carry said series of record arbors; means adapted to intermittently advance said carrying means; an elevator having an operative movement between said phonograph and said series of record arbors and adapted to contact with the latter successively; means adapted to actuate said elevator intermittently; and gearing connecting said latter means and said phonograph driving means.

29. In automatically-operating mechanism of the character described, the combination with a phonograph; of means for driving the same; a base for said phonograph; a frame supported by said base; a series of record arbors; means supported by said frame and adapted to carry said series of record arbors; means adapted to intermittently advance said carrying means; an elevator having an operative movement between the playing position of the record arbors upon said phonograph and a fixed position upon said frame, and adapted to successively contact with said record arbors at said fixed position; a shaft supported by said base; means operatively connecting said shaft and said phonograph driving means; a clock-spring-actuated mechanism carried by said shaft; an eccentric operated by said mechanism; and levers and links connected to said eccentric and said elevator to actuate the latter between each two movements of said carrying means.

30. In automatically-operating mechanism of the character described, the combination

with a phonograph; of a driving shaft therefor; a series of records; means adapted to automatically bring said records successively into position between centers upon said phonograph; and means adapted to move a record so positioned into rotative engagement with said driving shaft.

31. In automatically-operating mechanism of the character described, the combination with a phonograph; of a driving shaft therefor; a chuck operatively connected to said driving shaft; a series of records; means adapted to elevate said records successively into position between centers upon said phonograph; and means adapted to move a record so positioned into rotative engagement with said chuck.

32. In automatically-operating mechanism of the character described, the combination with a phonograph; of a driving shaft therefor; an extended bearing; a chuck operatively connected to said driving shaft in said bearing; a series of records having suitable arbors and shafts; means adapted to elevate said records successively into position between centers upon said phonograph; and means adapted to move the arbor and shaft of a record so positioned into rotative engagement with said chuck.

33. In automatically-operating mechanism of the character described, the combination with a phonograph; of a driving shaft therefor; a series of records; means adapted to automatically bring said records successively into position between centers upon said phonograph and to displace the same therefrom; and means adapted to move a record so positioned between centers into rotative engagement with said driving shaft and to release the same therefrom.

34. In automatically-operating mechanism of the character described, the combination with a phonograph; of a driving shaft therefor; an extended bearing; a chuck operatively connected to said driving shaft within said bearing; a series of records having suitable arbors and shafts; means adapted to automatically bring said records successively into position between centers upon said phonograph and to displace the same therefrom; and means adapted to move the arbor and shaft of a record so positioned between centers into rotative engagement with said chuck and to release the same therefrom.

35. In automatically-operating mechanism of the character described, the combination with a phonograph; of a driving shaft therefor; a chuck operatively connected to said driving shaft; a series of records; means adapted to elevate said records successively into position between centers upon said phonograph; means adapted to move a record so positioned into rotative engagement with said chuck; and means adapted

to withdraw said elevating means from contact with the record after said engagement, so that said shaft may freely rotate.

36. In automatically-operating mechanism of the character described, the combination with a phonograph; of means for actuating the latter; a base for said phonograph; a frame supported by said base; a series of records; means supported by said frame and adapted to carry said series of records; an elevator adapted to contact with said records and having an operative movement between said carrying means and the playing position of the records upon the phonograph; means for intermittently actuating said elevator; a shaft supported by said base; gearing operatively relating said shaft to the phonograph; a clock-spring-actuated mechanism adapted to rotate upon said shaft; an eccentric operatively related to said mechanism; and levers and links operatively related to said eccentric and the aforementioned record-carrying means, and adapted to cause said record-carrying means to be actuated intermittently between each two movements of said elevator mechanism.

37. In automatically-operating mechanism of the character described the combination with a phonograph; of a main driving shaft therefor; a base for said phonograph; a frame supported by said base; a series of records; carrying means for the latter supported by said frame; means adapted to intermittently advance said carrying means; an elevator adapted to contact with said records and having an operative movement between said carrying means and the playing position of the records upon the phonograph; a second shaft; gearing connecting said latter shaft to said main shaft; a clock-spring-actuated mechanism operatively connected to said elevator and adapted to rotate on said second shaft, said clock-spring being adapted as an intermediate connection between said rotative mechanism and said shaft and serving to accumulate power caused by the rotation of said shaft; a smaller semi-rotative shaft and levers thereon; a cam adapted to said clock-spring shaft and rotated thereby; means intermediate of and adapted to cause said levers and smaller shaft to act against said cam and thus cooperate with said clock-spring mechanism to cause said rotative mechanism to be released and thereby rotate intermittently as controlled by said cam.

38. In automatically-operating mechanism of the character described, the combination with a phonograph; of a base therefor; a frame supported by said base; a series of records; means supported by said frame and adapted to carry said series of records; means adapted to intermittently advance said carrying means; a shaft supported by

said base; means operatively relating said phonograph and said shaft and adapted to drive the latter; a clock-spring-actuated mechanism carried by said shaft; means operated by said mechanism and adapted to bring said records successively into position upon said phonograph; a governor mounted upon said base; and a train of gearing attached to said mechanism, driven thereby, and operative to actuate said governor, the latter serving to impede the motion of said clock-spring mechanism.

39. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable actuating mechanisms therefor; of a series of records; a pair of channel guides; and means cooperating with the said actuating mechanisms and adapted to displace each record in the series, guide the same into position on the said phonograph by said channel guides, and to replace the same in said series.

40. In automatically-operating mechanism of the character described, the combination with a phonograph; and suitable actuating mechanisms therefor; of centers for said phonograph; a base for the latter; a frame supported by said base; a series of records provided with suitable arbors and shafts; carrying means for the latter; supported by said frame; means adapted to intermittently advance said carrying means; an elevator adapted to bring a record from said series in position between centers upon said phonograph; means adapted to intermit-

tently operate said elevator; a shaft; gearing operatively connecting said phonograph and said shaft and adapted to drive the latter; a cam attached to said shaft; and levers and intermediates operatively related to said cam and to one of the phonograph centers, the construction being such as to cause said center to move forward at the proper time and thus engage the record arbor and force it into position to be rotated.

41. In automatically-operating mechanism of the character described, the combination with a phonograph and suitable cooperating mechanisms; of a supporting frame; a main driving-shaft; a series of records; means adapted to carry the latter; an elevator having a path of movement between said carrying means and the playing position of said records upon said phonograph and adapted to contact with a record and remove the same from said carrying means; a second shaft operatively connected with said main shaft; three cams actuated by said second shaft; and actuating mechanisms connected intermediately of said cams, respectively, and said carrying means, said elevator, and the cooperating mechanisms of said phonograph, respectively.

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

J. I. GEMMILL.

Witnesses:

LECTA M. GEMMILL,
MARY DRISCOLL.