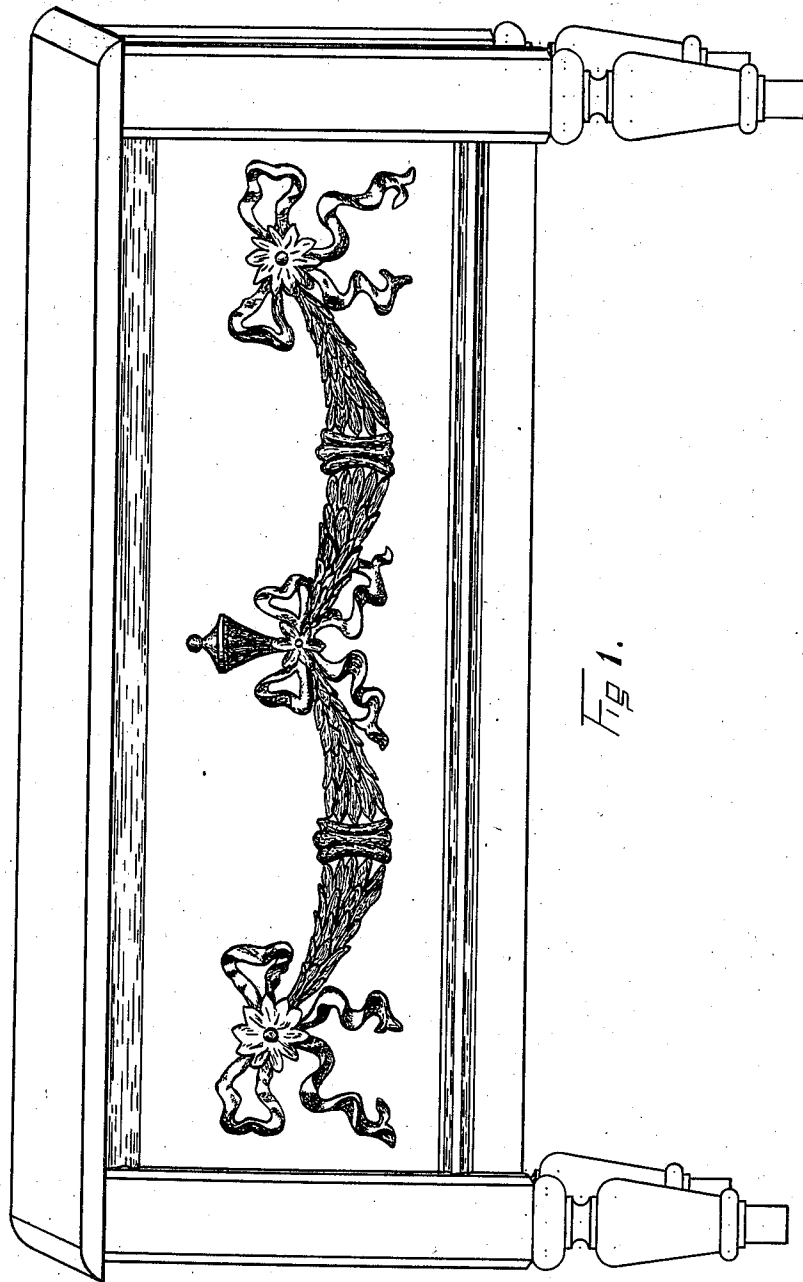


J. I. GEMMILL.
AUTOMATIC GRAPHOPHONE OF THE DISK RECORD TYPE.
APPLICATION FILED MAR. 1, 1911.

1,028,707.

Patented June 4, 1912.

12 SHEETS—SHEET 1.



Witnesses:
A. J. Fuller
Warren Ramsey

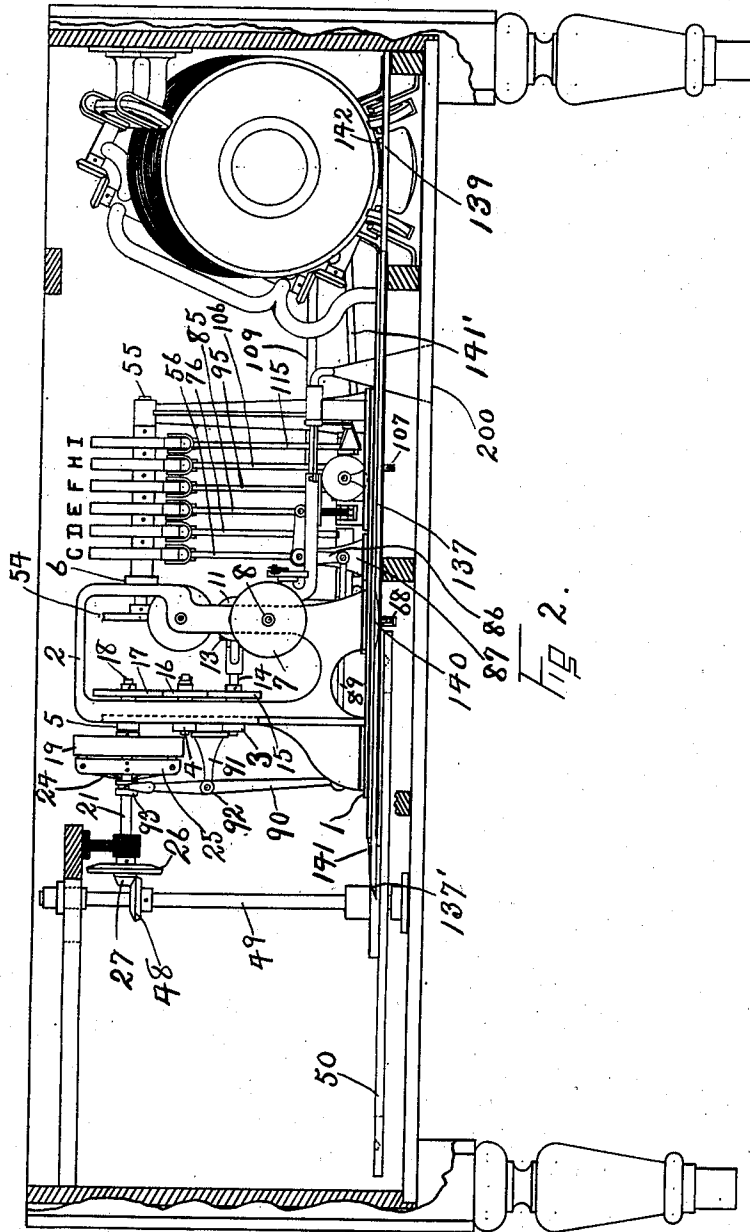
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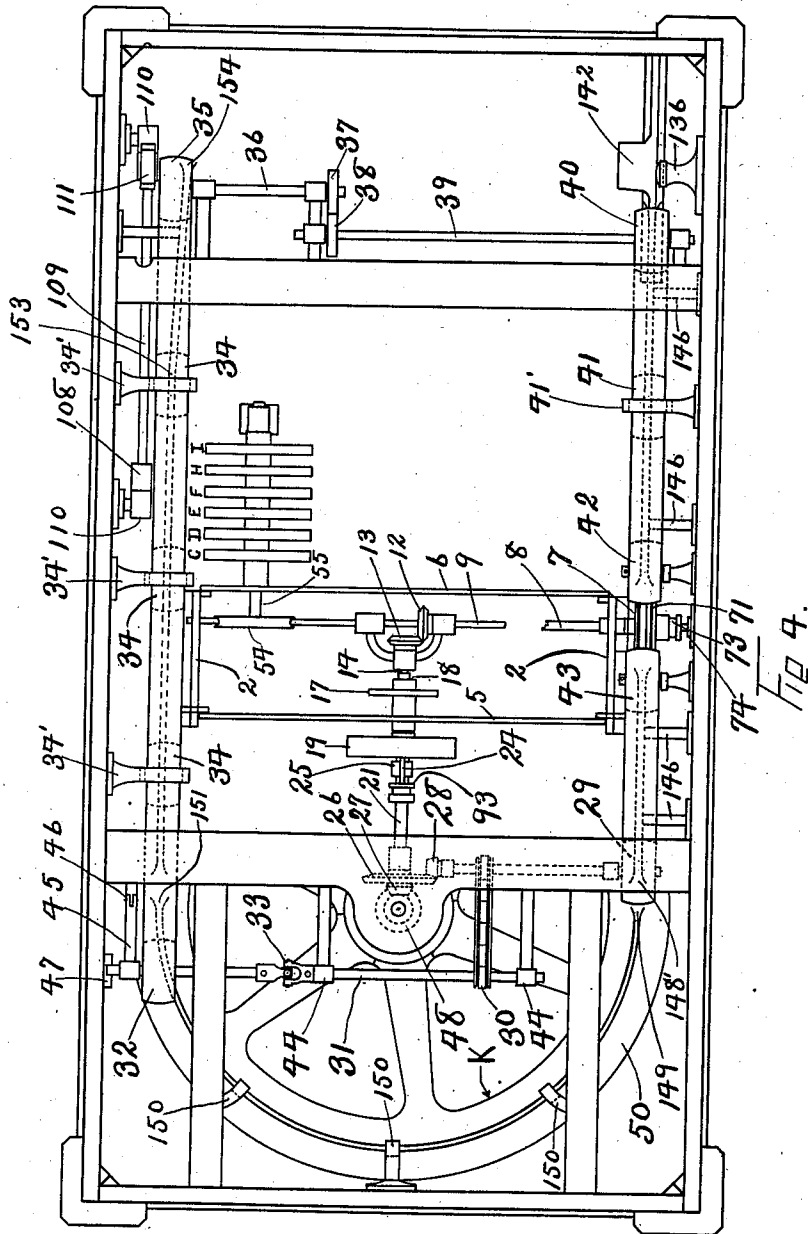
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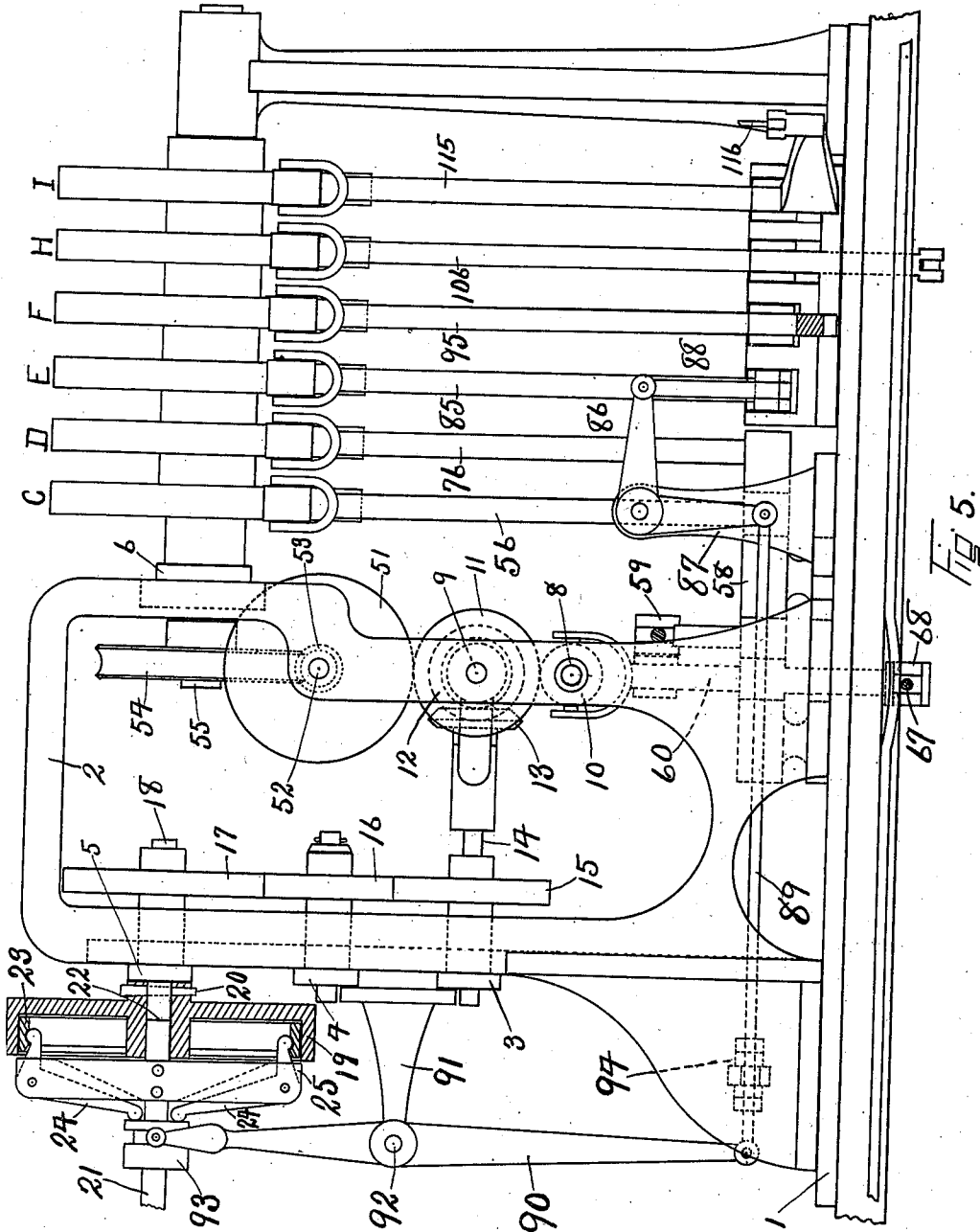
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12 SHEETS—SHEET 5.



Witnesses:
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 Warren Ramsey

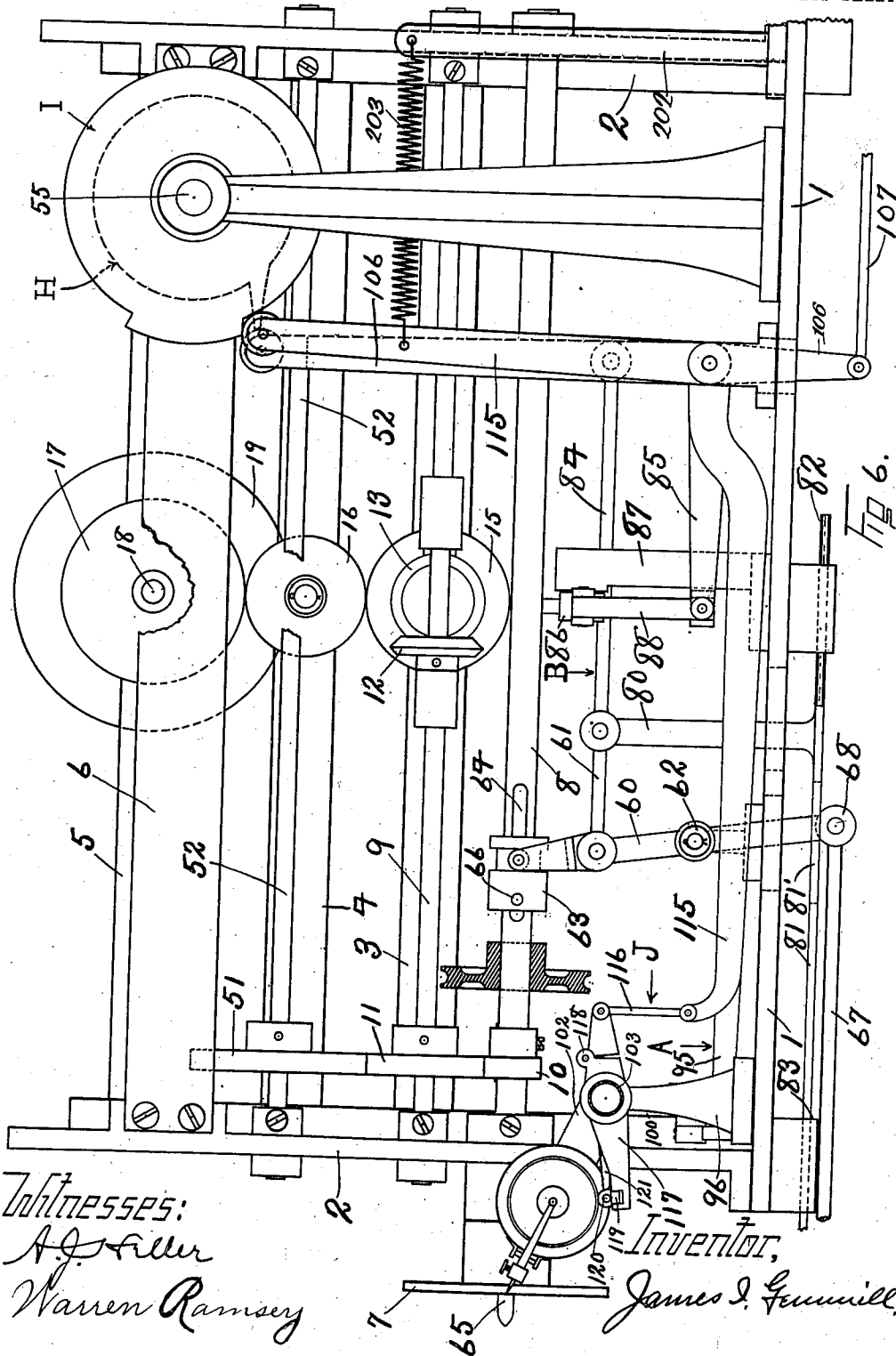
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12 SHEETS—SHEET 6.



Witnesses:
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Inventor,
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12 SHEETS—SHEET 7.

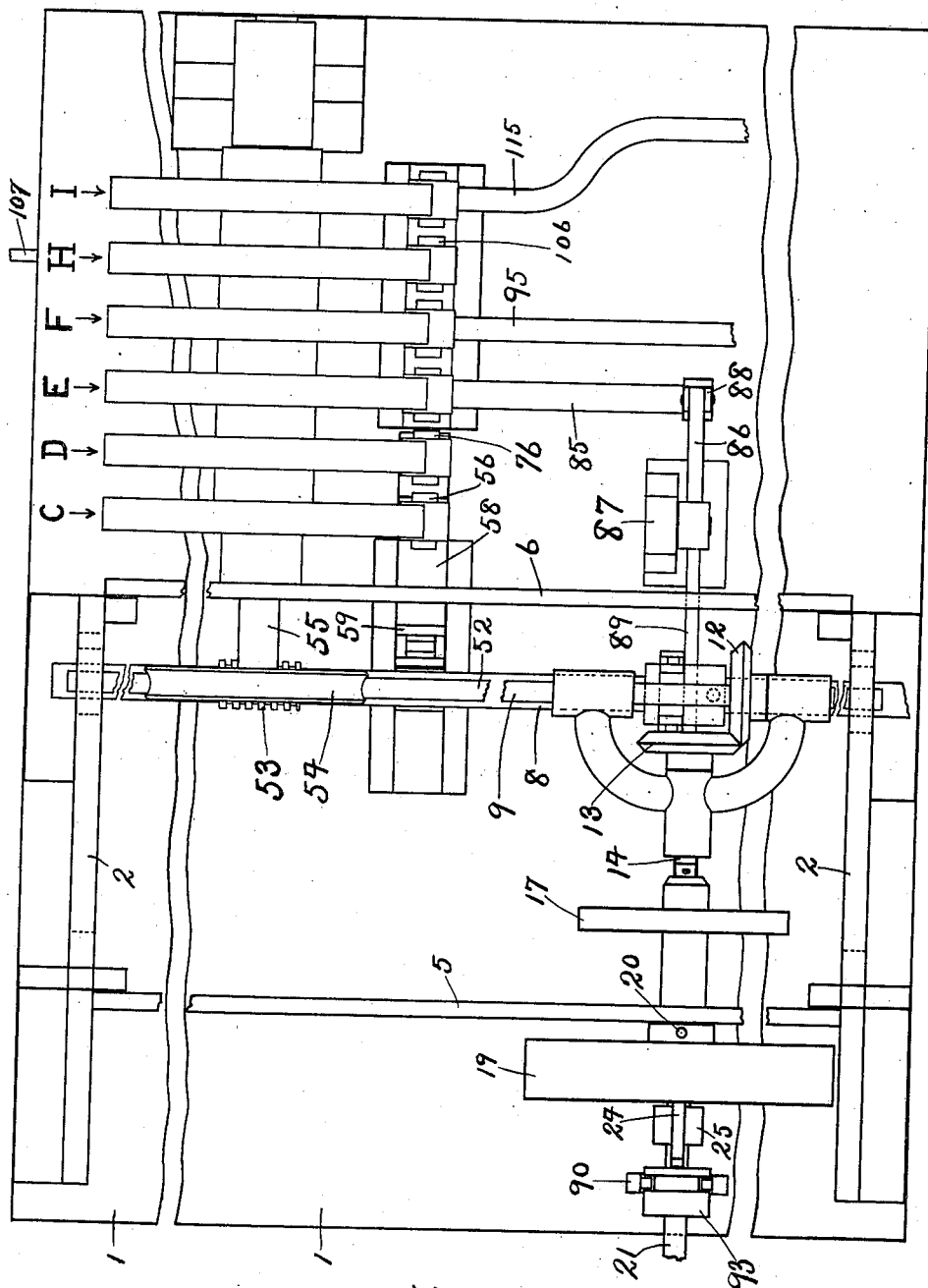


Fig. 7.

Witnesses:
 A. J. Heller
 Warren Ramsey

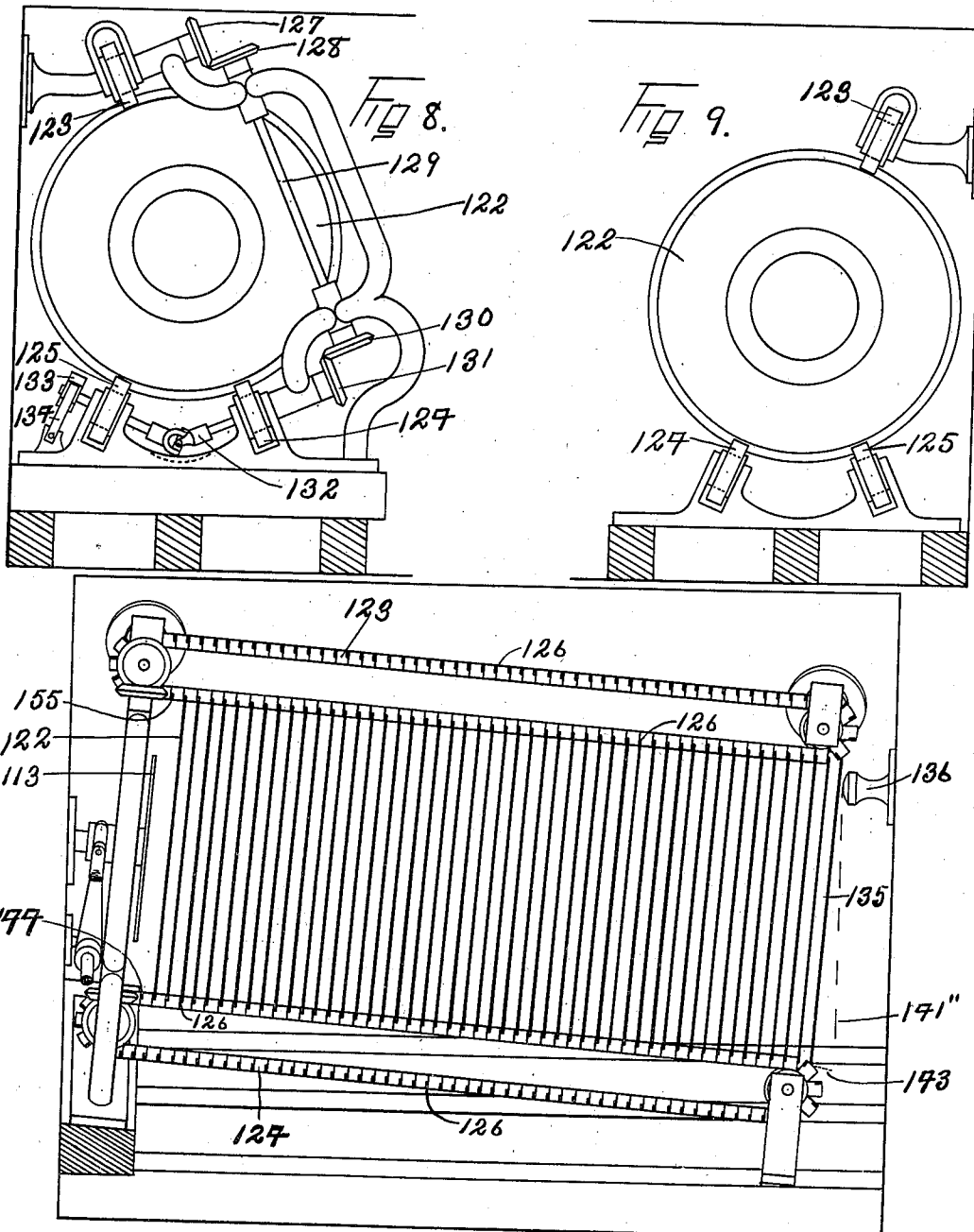
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12 SHEETS—SHEET 8.



Witnesses:
 A. J. Keller
 Warren Ramsey

Fig 10.

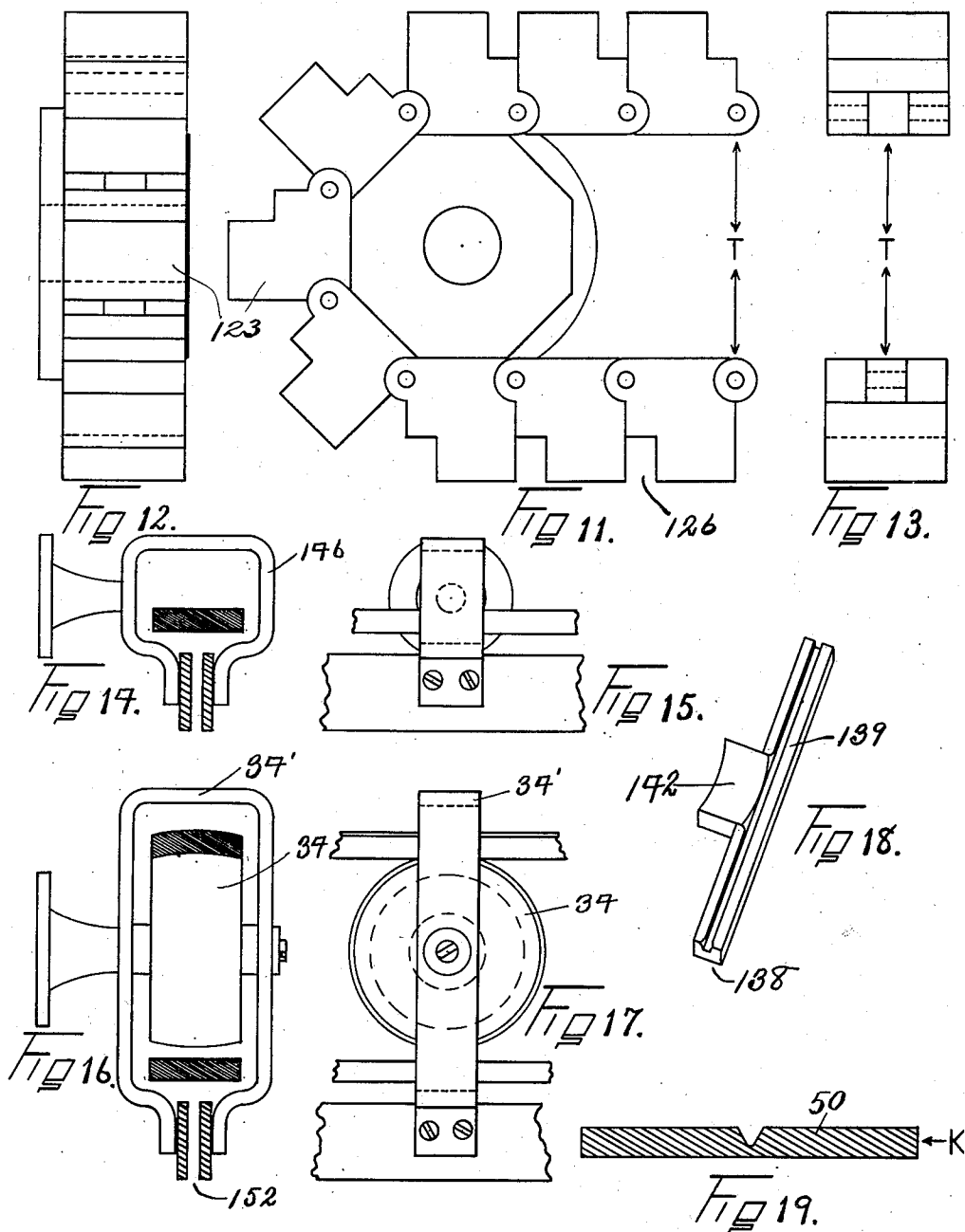
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12 SHEETS—SHEET 9.



Witnesses:
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 Warren Ramsey

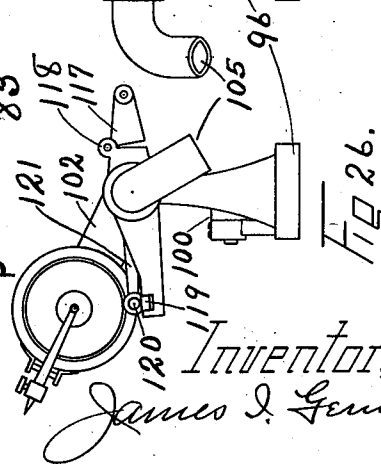
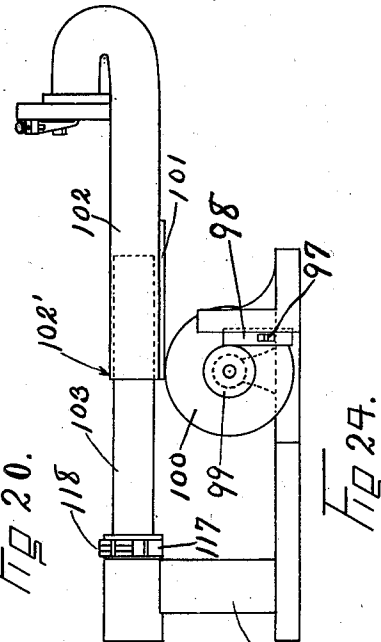
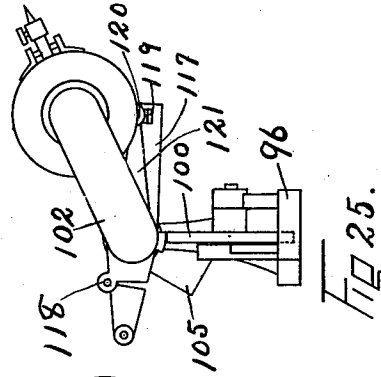
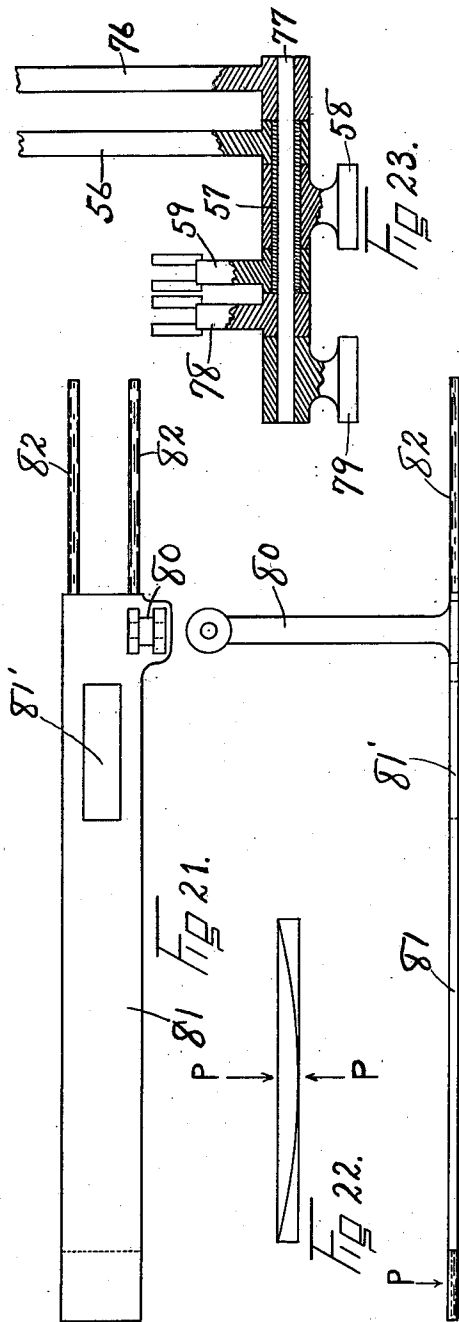
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12 SHEETS—SHEET 10.



Witnesses:
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 Warren Ramsey

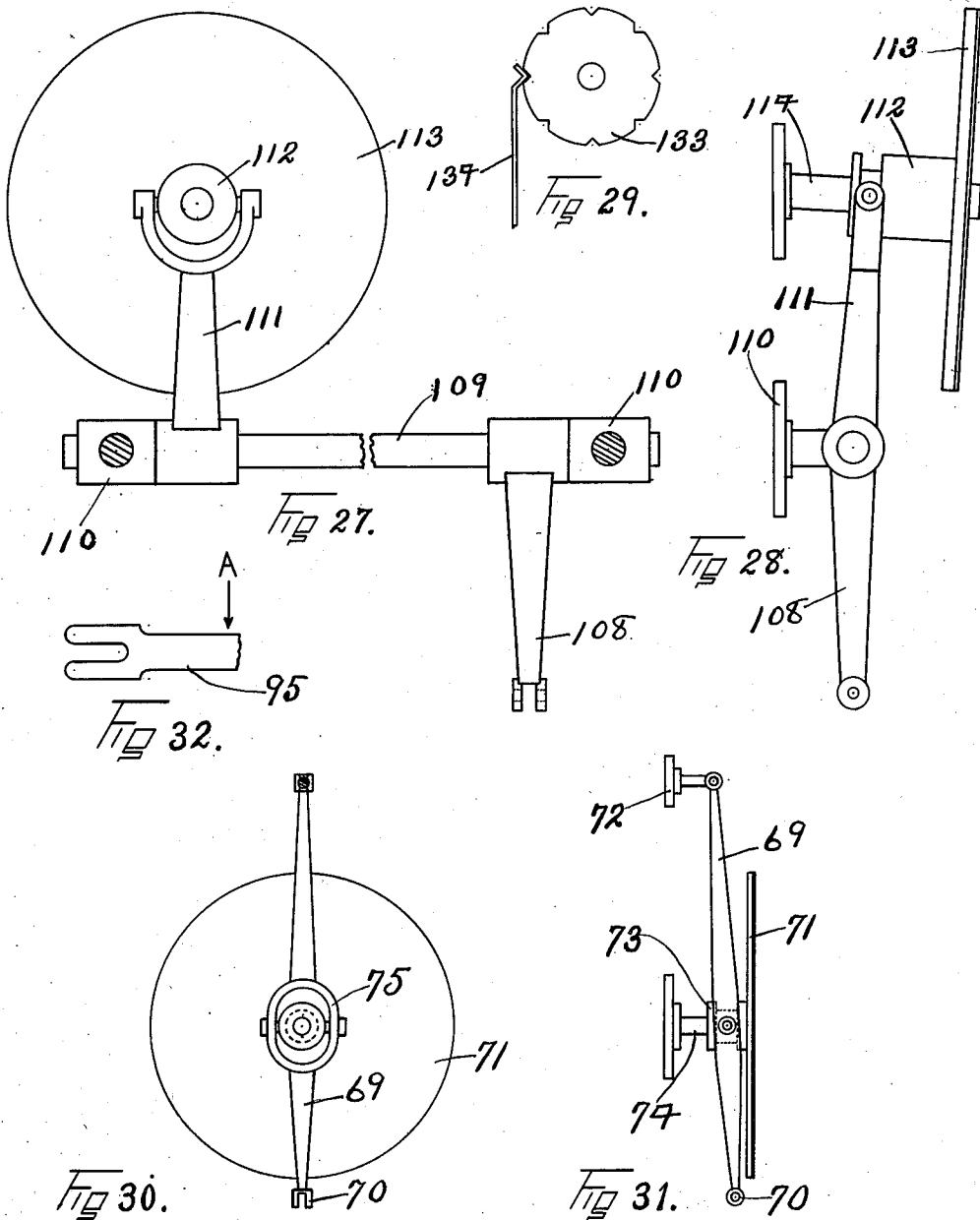
Inventor,
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12 SHEETS—SHEET 11.



Witnesses:
 A. J. Haller
 Warren Ramsey

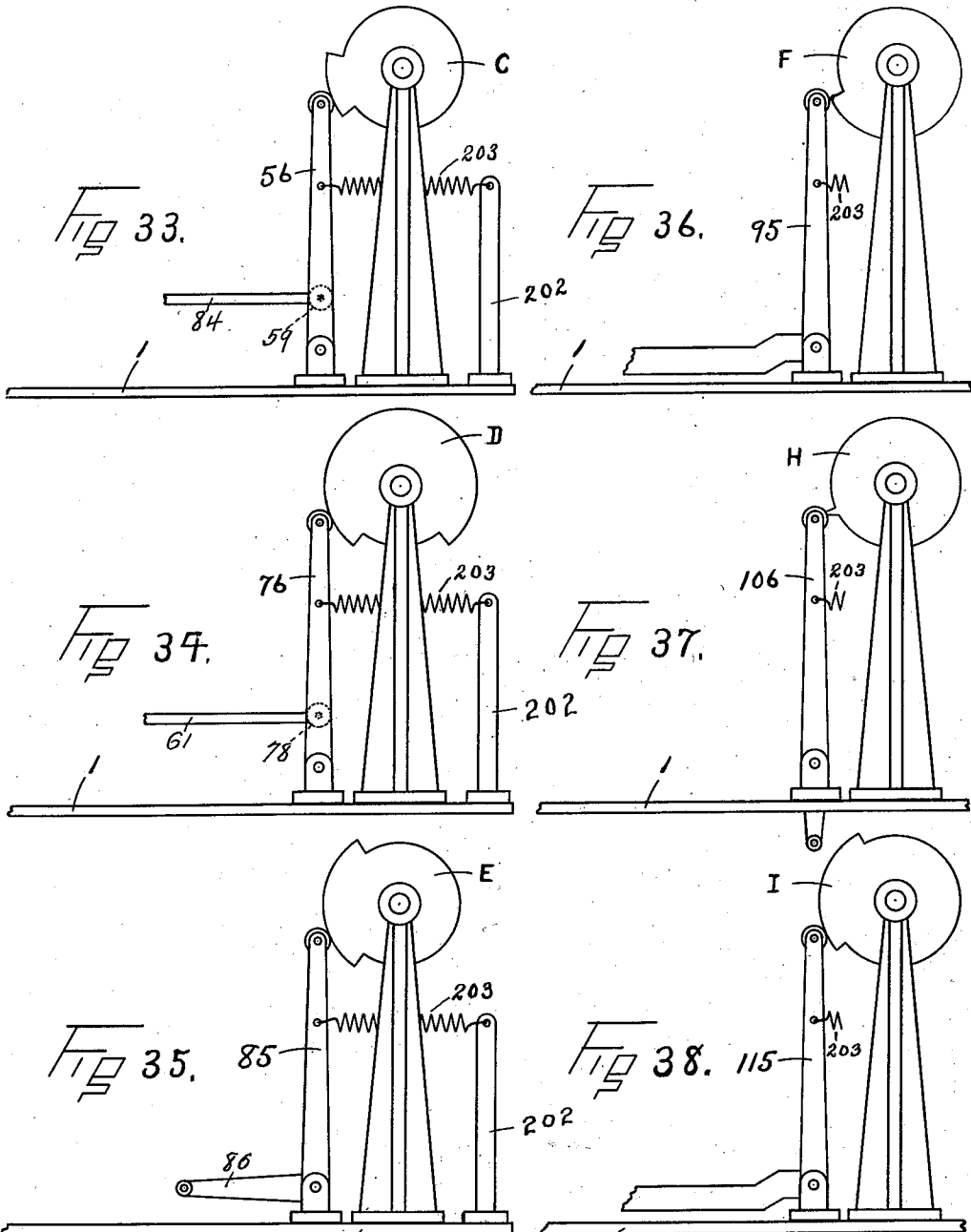
Inventor,
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1,028,707.

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12 SHEETS—SHEET 12.



Witnesses:
 Warren Ramsey.
 A. J. Miller.

Inventor,
 James I. Gemmill.

UNITED STATES PATENT OFFICE.

JAMES I. GEMMILL, OF ORRVILLE, OHIO.

AUTOMATIC GRAPHOPHONE OF THE DISK-RECORD TYPE.

1,028,707.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed March 1, 1911. Serial No. 611,671.

To all whom it may concern:

Be it known that I, JAMES I. GEMMILL, a citizen of the United States, resident of Orrville, county of Wayne, and State of Ohio, have invented a new and useful Improvement in Automatic Graphophones of the Disk-Record Type, of which the following is a specification.

The principle of the invention is herein explained, and the methods used to apply that principle so as to differentiate this invention from the prior art.

My invention relates to automatic mechanisms and particularly to a multiple disk-record graphophone.

My invention more particularly relates to mechanism of the character adapted to handle and play a large number of disk records of the type having a selection recorded on each side thereof and further adapted to turn the record and play the reverse side, from that last played, in an alternate manner. This arrangement provides a machine, excellent for the purpose of a continuous performance without any attendance whatever.

The silent period, or the time during which a record is changed and turned is very short and as the machine is electrically operated, it meets all of the requirements for this type of a machine.

In this construction, I have introduced novel mechanical features in the preferred forms of the several different mechanisms comprising the machine which are herein after fully illustrated and described and in conformity with said illustration and description, will be fully set forth in the appended claims.

I attain the above results by using the mechanism disclosed in the drawings accompanying this specification and which forms a part thereof.

Reference will now be had to the drawings wherein—

Figure 1, shows the entire machine; Fig. 2, is a vertical front view of said machine as in Fig. 1, with the lid and front side removed and cut away respectively, and serves to disclose therein a portion of the mechanism and a bank of the records in position; Fig. 3, is a view similar to the last, except that the mechanism shown in Fig. 2, or the greater part thereof has been removed, and the elevated structure, comprising the elevated belts as a traveling member, and the tracks together with the necessary pulleys

are shown, and two records are also shown as they appear going to and from the playing position and on their respective tracks. Fig. 4, is a plan view of the machine, viewed from above and serves to show the whole system of belts and guide tracks and their relative position to the large transferring wheel. Fig. 5, is a front elevation of the principal actuating mechanism, comprising the cams, levers and other active elements. Fig. 6, is a side elevation of Fig. 5, as viewed from the right side thereof. Fig. 7, is a plan view from above, of Figs. 5, and 6, and shows all of the respective parts in their relative position, except the two housings which are set in, in the drawing, and the base plate, shafts, and connections are broken away, so as to permit this said condition. Fig. 8, is an elevation view of the chain sprocket wheels and frame work for same and the gearing adapted thereto, and represents the rear end of the chain carrying mechanism. Fig. 9, is an elevation view of the companion chain sprockets adapted to the front end of the said chain carrying mechanism. Fig. 10, is a semi-perspective view of the sides of the last two described figures respectively, combined to show their assembly position and including two of the chains mounted thereon, together with a series of records assembled in the said chains. Fig. 11, is a side elevation in enlarged form of one of the sprocket wheels, with a section of one of the said chains showing how it is adapted thereto. Fig. 12, is an edgewise view of the last figure, and serves to show the relative thickness of the chain blocks. Fig. 13, shows two block-links with male and female joint lugs respectively, being shown thereon. Fig. 14, is a side elevation of one of the elevated guide track brackets showing the said tracks in section thereon. Fig. 15, is another view of the same from the front. Fig. 16, is a side elevation of one of the combination guide track and pulley brackets showing a pulley and belt thereon and a portion of the guide track in section thereunder. Fig. 17, is another view of the same from the front. Fig. 18, is a perspective view of a portion of the lower track way, for the records, and showing the slide way over which the record passes to enter the track. Fig. 19, is a section of the large transferring wheel at point K, and serves to show the shape of the continuous circular record track formed thereon. Fig. 20, is a side ele-

vation view of the slide member, while Fig. 21, is another view of same. Fig. 22, is an enlarged end view of Fig. 20, as at point P, P, and serves to show how this end is shaped to conform with a certain depression in the record track. Fig. 23, is a detailed elevation view, partly in section, of two of the cam levers and bearings therefor and serves to show how they both operate upon one center. Fig. 24, is a plan view of the "sound box" or reproducer with its mounting. Fig. 25, and Fig. 26, are other views of Fig. 24, and serve to show the mechanism for traversing the reproducer along horizontally as well as elevating it to raise it from off a record when in a playing position. Fig. 27, is a rear elevation view of the advancing mechanism for the records showing the lever and compression plate without the central support. Fig. 28, is another view of the same including the central support. Fig. 29, is an eight tooth ratchet-wheel and spring detent therefor, in enlarged form, and again seen as a part of Fig. 8. Fig. 30, is a rear elevation view of the turn-table and the lever connected therewith, and shown without the central support. Fig. 31, is another view of same and includes the central support and base for same. Fig. 32, is diagrammatic of the extreme end of lever 95, where it connects with the pin 97, and shows the finger arrangement of same. Figs. 33 to 38 inclusive are detail views in side elevation of the actuating cams showing the engaging position of each cam with its follower.

In considering these drawings more particularly, it will be observed that similar numerals refer to similar parts throughout all of the disclosures.

Again referring to the drawings, in Fig. 2, is seen a base plate 1, upon which is mounted, a pair of housings, 2; these housings are joined together by bearing bars 3, 4, 5, and 6, and they all serve to contain the mechanism necessary to the main actuating portion of the machine. The rotating disk 7, is mounted on the semi-hollow shaft 8, Fig. 6, and which is geared to the shaft 9, shown in same figure by the gears 10, and 11; on this shaft 9, a wheel 12, is mounted, together with the necessary casting as a container for same; this wheel 12 is one of a pair of miter gears and a second similar gear wheel 13, co-acting with the wheel 12, is mounted on a cross shaft 14, and which carries a gear wheel 15, operating the idle gear 16, and the gear wheel 17, which rotates the shaft 18, upon which it is mounted; the shell of the friction clutch 19, is mounted on this last named shaft, by means of a pin 20 (see Fig. 5). The end of a second shaft 21, is seen at 22, within the member 19, wherein it has a bearing. This shaft serves to carry a flexible, inter-

mediate, connecting means between the two shafts 18, and 21, and in the preferred form, an ordinary friction clutch is used, comprising a split ring 23, and lever fingers 24, contained in a block 25, and which engage the said ring 23, to rotate it, and which are in turn rotatively carried by the said block 25, which is permanently attached to the shaft 21. Said shaft also carries a pair of bevel gear wheels, which are shown in Figs. 2 and 4, and there designated as 26, and 27, respectively. Considering Fig. 4, the gear wheel 26, is shown co-acting with a gear wheel 28, operating a shaft and pulley wheel 29, also, by means of a train of small gears 30, operating the shaft 31, and the pulley wheel 32; this shaft 31, is flexible, (for a purpose hereinafter mentioned,) by reason of the tumble-joint 33; motion, is transmitted from the wheel 32, by a heavy felt belt, being $\frac{3}{8} \times 1\frac{1}{2}$ in cross section dimension and running over idle wheels 34, to the pulley 35, which operates the shaft 36, and the gear wheel 37, which co-acting with the gear wheel 38, operates the shaft 39, and the pulley 40, upon which is mounted another belt of similar character and running over idle wheel 41, to the fixed pulley 42. Referring to pulley 29, a third similar belt is operated thereby and runs over the fixed pulley 43. The shaft 31, is in two sections connected by the tumble joint 33; that portion of the shaft operated by the train of gears 30 being journaled in bearings 44, and the remainder of the said shaft, together with the pulley 32, have a small range of flexibility upward, permitted by the tumble-joint and the fact that the outside bearing 45, in which the said remaining portion of the shaft is journaled is hinged at 46; the weight of the shaft and dependent parts thereon, is taken by a bearing block at 47. This completes what is termed the elevated movement, again seen in Fig. 3. Referring to gear 27, it is seen in Figs. 2 and 4 as co-acting with a gear wheel 48, and serves to rotate the shaft 49, which is vertical, and upon which, at the lower end, a large wheel 50, is mounted and which is better shown in Fig. 4, while the said shaft is better seen in Figs. 2, and 3. A cross section of the rim of this large wheel 50, is shown in enlarged form at K, Fig. 19. The function of this wheel will be taken up hereinafter, together with other parts not yet mentioned.

Referring again to the shaft 9, and gear 11, Fig. 6, the said gear co-acts with a gear 51, on the shaft 52, which serves to operate a worm screw 53, seen in Fig. 7, and co-acting with the worm wheel 54, operates a shaft 55, upon which are mounted six disk cams, C, D, E, F, H, and I, respectively. Taking up these cams in their order as above, and following the motion of the parts actuated by them, we commence with

cam C, operating a lever 56, Fig. 5, better shown in Fig. 23, where it is shown arranged upon a tubular shaft 57, mounted in a bearing 58, and also carrying another lever 59, which is connected by means of the link 84, to a lever 80, which is integral with slide member 81, Figs. 20, and 21, and which is adapted to slide on its lower surface at or about point 3, and also on the pins 82, shown engaged with the frame work in Fig. 6.

Cam D, Fig. 7, is operably related to a lever 76, Fig. 5, again shown at Fig. 23, and which is mounted on a shaft 77, passing through the tubular shaft 57, and to which is attached another lever 78, while a bearing 79, serves to retain the said shaft in alinement with the tubular shaft 57. The lever 78, is connected to a lever 60, by a link 61 as seen in Fig. 6. This lever 60 is fulcrumed at 62, and is operably connected to the sliding sleeve 63, mounted on the before mentioned semi-hollow shaft 8; a slot 64 is cut through the shaft 8 extending parallel with the sides thereof and communicating with the hollow within said shaft. In said hollow shaft 8 is a slidably arranged pin 65 through which passes a pin 66 carried by the sleeve 63 and working in the slot 64; it will be obvious that these members are thus connected in such a manner that they are permitted to slide together to the extreme limits of the said slot. A link 67, is connected to the lower end of lever 60, at 68, and will be observed again at Fig. 5, where it passes or extends forward to connect with the lever 69, at 70, Fig. 30. The position of lever 69, is suggested in Fig. 4, where the turntable 71, is shown without the said lever.

This lever 69, is fulcrumed on a base 72 Fig. 31, and a sliding sleeve 73, integral with the member 71, is adapted to slide on a base standard 74, and is there operated by that portion of lever 69, shown at 75, in Fig. 30. It will be noted that the lower end of the lever 60, works through a slot 81', shown in the slide 81, in Fig. 6.

The above relative parts, namely, 72, 73, and 74 are not all shown in the assembly although their relative positions are disclosed by the parts 73 and 74 in Fig. 4. The member 72 is not shown therein, and since it is directly above the parts 73 and 74, is omitted in this figure to avoid prolixity of lines in the drawing.

Cam E, in Fig. 7, is adapted to operate lever 85, shown in Figs. 5, 6 and 35, which lever in turn operates a "bell-crank" lever 86, attached to a base 87, on which it is fulcrumed; the said connection being made by the link 88, and a long link 89, serves to connect said "bell-crank" to the lower end of a lever 90, which is fulcrumed on a support 91, at 92 (Fig. 5) the upper end of this lever 90 engaging and operating a sliding

sleeve 93, which is mounted on the aforementioned shaft 21; said sleeve is operably opposed to the beforementioned "lever-fingers" 24. The arrangement shown in dotted lines, outlined thus in Fig. 5, on the link 89, at point 94, discloses a "right" and "left" hand threaded nut, with "jam" nuts included, all of which are adapted for the purpose of adjustment of the distance between the centers of the end connections of the said link 89, and any difference of said distance, obviously must change the resultant travel of the said lever fingers and their pressure on the split ring 23.

Cam F, Fig. 7, is adapted to operate lever 95, Figs. 5, and 6, and in the latter figure a portion of the lever is seen disappearing back of the base 96, and while not again shown, it is adapted by means of its peculiarly shaped extreme end, (as at Fig. 32,) to engage the pin 97, in the vertical rack 98, seen in Fig. 24. This rack operates the gear pinion 99, which is integral with the gear wheel 100, and which in turn operates in connection with the horizontal rack 101, which is integral with the "sound-box" tube 102, to slide the latter along, on and over the inner tube 103 which is supported by the base 96, and as seen terminates in the elbow 105.

Cam H, Fig. 7, is adapted to operate the lever 106, shown in Figs. 5, 6 and 37, and is connected by the link 107, (see Fig. 6,) to the lever 108, Fig. 4, which is again seen in Fig. 27. This lever is mounted on a shaft 109 and sustained by a pair of bearings 110, which are adapted to permit a semi-rotative relation between said shaft and said bearings; another lever 111, is mounted on this same shaft and is adapted to operate a sleeve 112, which is integral with the plate 113, which is adapted to slide upon the base standard 114. The position of the subject matter of Figs. 27, and 28, and in the general *ensemble* of this machine is better shown in Figs. 2, and 4. In Fig. 4 however, the arrangement is shown including the lever 111 only; the base 114 together with the sliding members 112 and 113 are omitted to avoid confusion of lines. The position of these omitted parts however is in the rear of and in alinement with the bank of records shown in Fig. 2, and the relative arrangement of these parts is seen in Fig. 10. Cam I, Fig. 7, is adapted to operate lever 115, seen in Figs. 5, and 6, and which is connected by the link 116, to the lever 117, that is semi-rotatively mounted to fulcrum upon the tube 103, in Fig. 24. This lever is hinged at 118, to permit flexibility, possibly required, and has a roller 119, mounted in one end thereof, and which is adapted to sustain a rod 120, having a rolling contact therewith, said rod being mounted at one end in the lever 121; the lever 121 is inte-

gral with the "sound box" tube 102, connecting thereto at or about the point 102' shown in Fig. 24. A study of this mechanism must make it appear obvious that the said "soundbox" will remain in the position shown, until the said levers are moved, which will cause the said "sound box" and tube to move semi-rotatively around the said tube 103, independent of their, then horizontal, location upon the said tube 103. Inasmuch as none of the cams are positive both ways, in their action, but are only permissive in the return of their respective levers, it may be desirable to employ spiral springs 203, suitably arranged to exert pressure on the said levers to keep them in working contact with their respective cams at all times. In Figs. 8, 9, and 10, are shown details in the first two and assembly in the latter, of a bank consisting of a series of disk records, mounted edgewise and inclined somewhat from the perpendicular, in a system of carrying chains. The records 122, rest in, on and between these chains 123, 124, and 125, occupying recesses in the links thereof, shown at 126, and more fully shown in Fig. 11. The three chains run on octagonal sprocket wheels which are all geared together by means of wheels 127, 128, shaft 129, and wheels 130, 131, and tumble-joint 132, in such a manner as to preserve the same relative positions of certain links in each of the said chains at all times. The motion is retarded by the eight point ratchet wheel 133, together with the detent spring 134, Fig. 8, and which is shown enlarged in Fig. 29. The point of actual retardance, being shown in the position of parts in Fig. 10, which is at a time when a record has just been discharged from the chains to a position as seen at 135, where the upper edge of the said record rests against the stop post 136. The remainder of this record motion will be taken up in the description of the general action of the machine.

Referring to Fig. 2, we will trace the lower track 137, which is shaped as in Fig. 18, at the point 138; this member shown in Fig. 18, is introduced as member 139, in Fig. 2, and is the commencement of the aforementioned track 137, which extends along horizontally until it describes a depression, as at 140, and thence along until it ends at 137', which is a point, that, were a line drawn from the center of the shaft 49, to the end of said track, at this point, then the included angle between that line and the general line of the said track, would approximate 92 or 93°. Another track, suggested at 141, commences directly opposite track end 137', and unlike its companion it ascends as it advances back to the record chains, as will be seen at 141'. These two tracks are arranged so that they end as described, directly over a similar grooved

track way in the rim of the wheel 50, which is seen to better advantage, in enlarged section in Fig. 19. The commencement of the front track, (embodied in the member 139,) is placed in position in such a manner that the groove in same will lie directly below the point, described by the perpendicular dotted line 141'', in Fig. 10, and the lip of same at 142, Fig. 18, being concave and describing the same curvature as the edge of the records and inclined in its introduction thereunder, (suggested by the short dotted line 143, Fig. 10,) serves as a conveyance for the lower edge of the record, into the track, to which point it slides. The terminus of the track 141, and 141', is directly opposite and near enough to the recess in the chain, shown at 144, Fig. 10, so that a record may roll and transfer from the former to the latter.

Referring to Figs. 3, and 4, we will trace the elevated tracks, which are companions to those last described, and as in Fig. 3, the commencement of same is at 145, and it is sustained, in its elevated position by a pair of guide track brackets 146, one of these brackets being adapted to each end of the said track respectively, and a combination wheel bracket 41' (which is constructed like the brackets 34') is attached to said track centrally between the brackets 146, completing this track. The terminus of this track is shown at a point nearly under the wheel 42, and comparison with Fig. 4, will disclose the relative position of the said terminus, with respect to the turn-table 71, and the disk 7, between which a record must pass after leaving the track. The hereinbefore mentioned depression 140, in the lower track, is directly below this disk and turn-table, and therein the record settles for a time. Another track, sustained by brackets similar to the brackets 146, and shown at 148, Fig. 3, terminates as shown at 148', in Figs. 3, and 4, in such a manner that the commencement of the elevated semi-circular track 149, as seen in Fig. 4, is in substantial alinement therewith and is adapted to act as a continuation thereof. Said track 149, is held in position by means of the brackets 150, and describes the same curve as that described by the grooved track in the rim of the wheel 50, and being directly above same, it terminates at 151. This point is in juxtaposition with the commencement of the rear elevated track and from this point, the said rear elevated track continues along, inclined upward, parallel with the track under it and it is sustained, in like manner to the front tracks as described, by means of brackets 34', within which the idle wheels 34, are mounted, and to which the said track is attached, as shown at 152, Fig. 16. When reaching the point 153, Fig. 4, this last named elevated track is diverted from

its original direction of path and from there on it leads over until reaching its terminus at the point 154, (which as shown, is still under the belt wheel 35,) but this "lead" is sufficient, so that when a record leaves the said track and the terminus of the lower track, as described, the said record will have an inclination from the true vertical, sufficient to cause it to enter, (not only the recess in the chain, designated at 144, Fig. 10,) but also the one above, at 155. Two records may be observed, shown in their respective positions, controlled by these said tracks, in Fig. 3, and it may be seen how the edge of the record extends above the upper track, to a point, where it may be engaged by the felt belt hereinbefore mentioned.

In describing one complete operation of this machine, reference being had to Fig. 2, all parts as seen therein are in a position as assumed by each, respectively, at a time, just before a record leaves the carrying chains to advance to a playing position. At this period of the operation, a record will be leaning against the post 136 as in Fig. 10, and the bottom edge of the record will be moving from the lower chains to the semi-circular lip 142, serving to guide the bottom of the record, which slides on the lip onto the track, and advancing in settling therein, the record moves until the top edge of same is engaged by the felt belt which is running on the wheel 40. It may be stated here, that the record really enters the track at point 145, at the same time it engages the said belt. This is due to the natural curvature of the edge of the record. The record is now traversed along the tracks by means of the belt engaging the top of the record and which rolls it to, and from, the end of the elevated track, where it, the said record, is discharged and the record is now between the turn-table 71, and the revolving disk 7, Fig. 4. The record has now settled in the depression in the lower track at 140, Fig. 2, and immediately thereafter the cam D, operates the lever 60, and through its respective communicating parts, it operates the sleeve 63, and the pin 65, thereby thrusting the said pin out to approximately the position of same, assumed in Fig. 6. The said record is in a position now, where the said pin 65, may engage the hole in the center of the record and in so doing, it passes through the record. The said record is thus forced to centralize on the pin and this raises it a small distance, (or to be exact, some less than one half of the diameter of the said hole,) and entirely out of the said depression 140 in the track.

The turn-table is automatically brought to contact with the record at one and the same time as the pin advances, by means of

the bottom connection of the said lever 60, and its intermediate link 67, connecting to the turn-table lever 69, disclosed in Fig. 31. The record is now revolving at the playing speed, which is 78 R. P. M. for the reason that the shaft 8, is caused to so rotate by a suitable motive power, electricity preferred, the source of which is not shown in any of the drawings. Immediately after the said record is so clamped in rotative position, the cam I, operates through its intermediate connections and the lever 117, and relative parts, to lower the sound-box and to bring the stylus, onto the record, assuming the position as seen in Fig. 6. Immediately after this action, the cam E, operates through intermediate connections, to release the clutch on the shaft 21, and the record traversing mechanism comes to a halt. At this period of the operation the cam F, actuates the lever 95, which operates the double rack and pinion movement shown in Figs. 24, and 6, and as hereinbefore described, the motion is adapted to traverse the said sound-box across the face of the record and on its recorded surface, and in such a manner, the cam F, being so shaped that its motion graduates the travel of the sound-box in a positive manner so that the stylus of same, freely "tracks" on the record without dragging. The return of the movement of these parts back to the normal starting position is permitted by the cam and is actuated by the spring member on the lever 95. The average number of convolutions in a record spiral track, taken from a large number of records has been found to be about 220 and I have timed the several motions of this mechanism in a manner so that in one complete operation of the machine the cam shaft 55, makes but one revolution in that time and the record shaft 8, makes 300 revolutions; which, if the 220 revolutions necessary to play the record, be subtracted, it will leave a remainder of 80 revolutions that the said shaft 8, must make, during which time the said records are changed. After the record has been nearly played, the cam C, operates to fill the depression in the lower track by means of the slide member 81, Figs. 21, and 6, through the intermediate connections between said member and the cam actuated lever 56. Thereafter, about this period, the record having been played, the cam E, operates to reengage the clutch on shaft 21, and the belt mechanism is caused to commence to operate. The cam I, operates to lift the sound-box stylus from off of the record and the cams D, and F, operate simultaneously to release the record by withdrawing the pin 65, and removing the turn-table 71, returning the sound-box back to its normal starting position, respectively. The record as it is released from the pin, is revolving at 78 R. P. M. and

falling edgewise, still reasonably confined by the revolving disk and the turn-table, in a vertical position, it gets an impulse forward when it comes in contact with the member 81, heretofore introduced and as the contact surface of this said member is flush with the continuation of the lower track, the record moves forward in the direction it is then revolving and immediately enters the second elevated guide track under the wheel 43, Fig. 3, and is engaged by the belt running thereon. By this belt it is traversed forward to where it is discharged from the belt and track, and dropping onto the rim track of the wheel 50, it enters the semi-circular track above and is carried around the said wheel, approximately one-half of the whole circumference of said wheel, to a point where the said record comes under the belt on the flexible shaft and pulley 32. The record reaches the end of the semi-circular track, while well under the last named belt, and as it obviously must roll up from off of the wheel 50, onto the rear lower track, the flexible shaft compensates for the said raise and consequent displacement of the belt upward. The record is then rolled to the chains by the third felt belt in the system, and is delivered into its respective notches in the said chains, as hereinbefore described, and immediately thereafter, the cam H, operates the lever 106, and the intermediate connections 107, 108, 109, and 111 are operated and thus actuate the thrust-plate 113, shown in Fig. 28, which is also seen in Fig. 10. The said plate 113 coming in contact with the last record just introduced into the chain's notches, causes the whole system of chains and records to advance a predetermined distance, or a space equal to the distance between one notch the next adjacent one in the chains, the ratchet wheel 133, acting as a retainer for this mechanism in this last named position and preventing it from running beyond. This action having been produced, the cam H, returns the thrust-disk back to its normal starting position and we have returned now to a point in the action of this whole mechanism that is identical with the point where we took up the description of the general operation.

It will be noticed that the whole body of records come forward in the chains, presenting the same "face" respectively, that was nearest the record preceding it, when they, the records respectively, entered the series in the rear. And, also, as the record is played, discharged and carried around to the series chains again, it has been turned, face about, as a natural consequence of the manner of operation of the mechanism employed, and it now presents the opposite face to its preceding companion than that which it last presented upon entering the

series and thus the record is turned, and every time a record is presented to be played it presents the opposite face for that purpose, than that which was last played. Thus a bank of 50 records will afford a selection of 100 different titles, or selections.

The paramount important feature of this machine, is that it is adapted to play the popular double-faced record of commerce and automatically handle a large number of same in a comparatively small space, turning the same so as to alternately play the selection on each side thereof respectively.

In the drawings of this machine, I have not laid any stress upon the horn connections, merely showing the horn from the sound box in Fig. 2, as opening out in the open air, at 200, and the details of same beyond that point are the subject of another application, as well as the details of the particular sound-box which I purpose using; the sound-box shown is of ordinary form, merely adopted here to enable me to illustratively connect the several parts in the drawings as shown.

Having thus described my invention clearly and in conformity with the disclosure in the drawings, so that those who are skilled in the art to which the invention appertains, may make and use same, what I claim and wish to secure by Letters Patent is—

1. In an automatic graphophone, the combination with a suitably-mounted bank of records, of means for automatically displacing the records successively from the bank, means for conducting each record as displaced to playing position, a sound reproducer mechanism, means for causing the sound reproducer to traverse the records while the latter are in playing position, and means for removing the records from playing position and returning them to the bank of records with their faces reversed.

2. In an automatic graphophone, the combination with a carrier for disk-records, a bank of disk records mounted therein in substantially vertical position, means for successively displacing the records and conducting them in vertical position to the point for playing, means for positioning the records in playing position, a sound reproducer, means for causing the sound reproducer to traverse the records while the latter are in playing position, means for removing the records from playing position and returning same to the carrier with their faces reversed from that occupied when displaced from said carrier, and means for intermittently advancing the carrier.

3. A mechanism for automatically-playing graphophone records of the double-faced disk type, comprising in combination, an intermittently-movable record carrier, a bank of records mounted edge-wise there-

in to be successively displaced therefrom, a sound reproducer, means for conducting each record as displaced from the carrier into position with relation to the sound reproducer, and means for automatically displacing the record after it is played and returning it to the bank of records with its reverse face presented in the direction of the carrier travel from that it occupied when displaced from said carrier.

4. In mechanism for automatically playing records of the double-faced disk type, the combination with an intermittently-movable record carrier, and a bank of records mounted edgewise therein to be successively displaced therefrom, of means for operating the carrier intermittently to successively displace the records, a sound reproducer, means for automatically conducting the records from their carrier-displaced position to playing position with respect to the sound reproducer, means for causing the sound reproducer to traverse the records while the latter are in playing position, means for removing the records from playing position, and means for turning the records and returning same to the opposite end of the bank of records in the carrier, said records throughout their travel and while in playing position being maintained in the edgewise position.

5. In mechanism for automatically playing graphophone records of the double-faced disk type in a vertical position, the combination with an intermittently movable record carrier, and a bank of records mounted edge-wise therein, of a sound reproducer, means for conducting the records in vertical position from the carrier to playing position with relation to the sound reproducer, means for causing the sound reproducer to traverse the records while the latter are in playing position, and means for reversing the records after their removal from playing position and returning the same to the carrier with their faces reversed from that which they occupied when displaced therefrom.

6. In mechanism for automatically playing graphophone records of the disk type in a vertical position, the combination with an intermittently-movable record carrier, a bank of records mounted edge-wise therein, a sound reproducer, means for automatically displacing said records from the carrier, said means utilizing the bank of records to effect displacement, and means conducting said records in a vertical position to playing position with respect to the sound reproducer, and means for returning the records automatically from playing position to the carrier with the records in a vertical position.

7. In mechanism for automatically playing graphophone records of the disk type

in a vertical position, the combination with a record carrier, and a record mounted edgewise in said carrier, of a sound reproducer, means for conducting the record from the carrier to playing position while maintaining the record in a vertical position, means for causing the sound reproducer to traverse the record with the latter in vertical position, and means for returning the record automatically to the carrier, the record throughout its travel and while in playing position being maintained in vertical position.

8. In mechanism for automatically playing graphophone records of the disk type, the combination with a sound reproducer, of means for conducting a record from non-playing to playing position with relation to the sound reproducer while maintaining the record in a vertical position, means for causing the sound reproducer to traverse the record while the latter is in vertical position, and means for maintaining the record in vertical position after it is displaced from playing position and is being returned to non-playing position.

9. In mechanism for automatically playing graphophone records of the double faced disk type, the combination with a bank of records mounted edgewise, of a sound reproducer, means for conducting the records successively from the bank to the reproducer in vertical position, means for causing the sound reproducer to traverse the records while the latter are in playing position, and means for reversing the records after their removal from playing position while returning the same to non-playing position in the bank.

10. In mechanism for automatically playing graphophone records of the double-faced disk type, the combination with a bank of records, and a sound reproducer, of means for conducting the records successively from the bank in vertical position to the reproducer, and means for turning and returning the records to the bank with their faces reversed from that in which they were removed therefrom.

11. In mechanism for automatically playing graphophone records of the double faced disk type while in the vertical position, the combination of a bank of records mounted edgewise, a sound reproducer, means for conducting the records from the bank into playing position with relation to the reproducer while maintaining the records in vertical position, means for reversing the records after their removal from playing position, and means for returning the records to the bank while maintaining the records in a vertical position.

12. In mechanism for automatically playing graphophone records of the disk type with the records in a vertical position, the

combination with a bank of records, and a sound reproducer, of means for conducting the records from the bank to the reproducer while maintaining the records in vertical position, and means for causing the sound reproducer to traverse the records while the latter are held vertically in playing position.

13. In mechanism for automatically playing graphophone records of the disk type with the records in vertical position, a record carrier, and a bank of disk records mounted edgewise therein, a sound reproducer, means for successively conducting records from the bank to the reproducer and maintaining the same in a vertical position, means for causing the reproducer to traverse the records while the latter are held in vertical position, and means for returning the records to the carrier.

14. In mechanism for automatically playing graphophone records of the disk type with the records in vertical position, the combination with a record carrier, and a bank of records mounted edgewise therein, of a sound reproducer, means for conducting the records from the carrier to the reproducer while maintaining the same in vertical position, and means including a cam for causing the reproducer to traverse the records while the latter are positioned vertically in playing position with relation to the reproducer.

15. In mechanism for automatically playing graphophone records of the disk type, the combination with a record carrier, a record mounted edgewise therein and a sound reproducer, of means for conducting the record from the carrier to the reproducer while maintaining the record in a vertical position, and means for causing the sound reproducer to traverse the record while the latter is held vertically in playing position.

16. In mechanism for automatically playing graphophone records of the disk type while the latter are held in vertical position, the combination of a record carrier, a record mounted edgewise therein, a sound reproducer, means for conducting the record from the carrier to the reproducer while maintaining such record in vertical position, and means including a cam for causing the reproducer to traverse the record while the latter is vertically positioned in playing position.

17. In mechanism for automatically playing graphophone records of the disk type and having a record on each face thereof, the combination with an intermittently-movable record carrier, a bank of records disposed edgewise in said carrier, a sound reproducer, means for conducting the records in vertical position from the carrier to the reproducer, means for causing the re-

producer to traverse the records while the latter are in vertically-disposed playing position with respect to the reproducer, means for turning the records after displacement from playing position, and means for returning the records to the carrier in their turned position, the records throughout their travel being maintained in vertical position.

18. In mechanism for automatically playing graphophone records of the disk type, the combination with a record carrier, and a bank of records edgewise positioned therein, of means for intermittently moving the carrier, a sound reproducer, means for conducting records from the carrier to the sound reproducer, means for causing the sound reproducer to traverse the records with the latter are vertically disposed in playing position with relation to the reproducer, and means for returning the records to the bank with their reverse faces presented in the direction of travel of the carrier.

19. In mechanism for automatically playing graphophone records of the double-faced disk type, the combination with a bank of records disposed edgewise, a sound reproducer, means for conducting the records from the bank and positioning the same vertically with respect to the sound reproducer, means for causing the reproducer to traverse the records while the latter are held vertically, and means for returning the records to the bank with their faces reversed from that in which they are removed therefrom.

20. In mechanism for automatically playing graphophone records, the combination with a bank of records disposed edgewise, a sound reproducer, means for displacing the records from the bank and arranging same vertically in playing position with respect to the reproducer, and means for returning the records with their faces reversed in the bank from that they occupied when displaced therefrom.

21. In a mechanism for automatically playing graphophone records of the disk type, a sound reproducer, means for automatically placing a record vertically in playing position with relation to the reproducer, and means including a disk-cam for causing the reproducer to traverse said record.

22. In a mechanism for automatically playing graphophone records of the double-faced disk type, a record carrier, a disk record mounted edgewise therein, a sound reproducer, means for conducting the record from the carrier to the reproducer while maintaining the record in a vertical position, means for causing the sound reproducer to traverse the record while the latter is held vertically in playing position, and means for automatically turning and returning the record to the carrier with its faces reversed

from that in which it was removed therefrom.

23. In a mechanism for automatically playing graphophone records of the double-faced disk type, a record carrier, a record mounted therein, a sound reproducer, and means for conducting the record from the carrier to the sound reproducer and for automatically positioning the opposite faces of the record in playing position with respect to the sound reproducer.

24. In a mechanism for automatically playing graphophone records of the double-faced disk type, a record carrier, a bank of records mounted therein, a sound reproducer, mechanically-operated record-engaging means acting when operated to move the bank of records and displace the foremost record in the bank, means for conducting said record to playing position with respect to the sound reproducer, and means for turning said record and returning it to the opposite end of the bank from that from which it was removed to present the reverse face of the record toward the removal end of the bank.

25. In a machine for automatically playing

graphophone records of the double-faced disk type, a record carrier, a bank of records mounted edgewise therein, a sound reproducer, mechanically-operated record-engaging means acting when operated to move the bank of records and displace the foremost record in the bank, means for conducting said record while maintaining the same vertically to playing position with respect to the sound reproducer, and means for turning said record and returning the same to the bank at the opposite end thereof from that from which it was removed to present the reverse face of the record toward the removal end of the bank, said means maintaining the record in vertical position during the turning and returning thereof to the bank.

In witness whereof I have signed this specification in the presence of two subscribing witnesses this 24th day of February, A. D. 1911.

JAMES I. GEMMILL.

Witnesses:

F. E. WOLFE,
G. J. WOLFE.