

E. P. FELT.  
GRAPHOPHONE.

(Application filed July 15, 1901.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

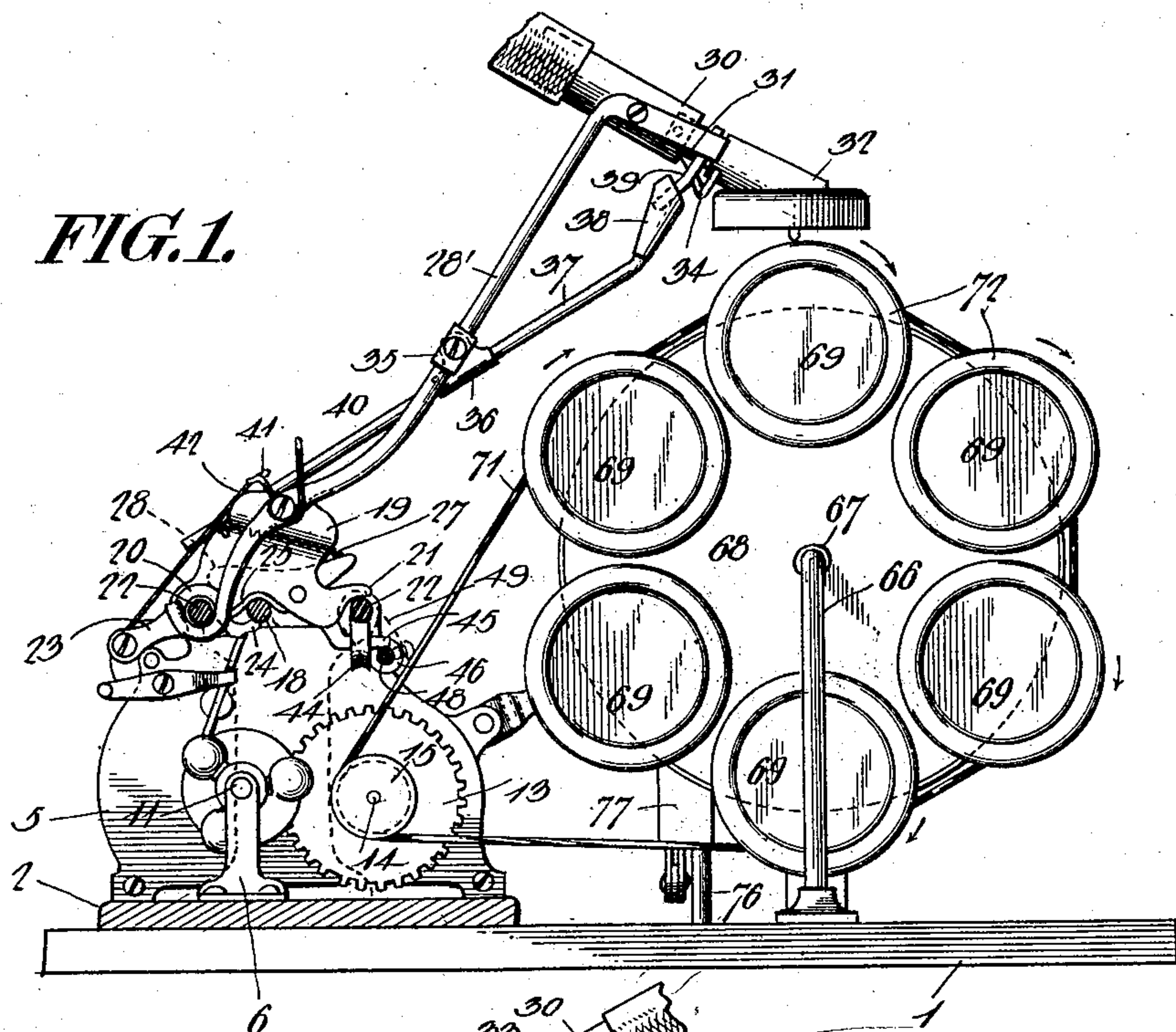
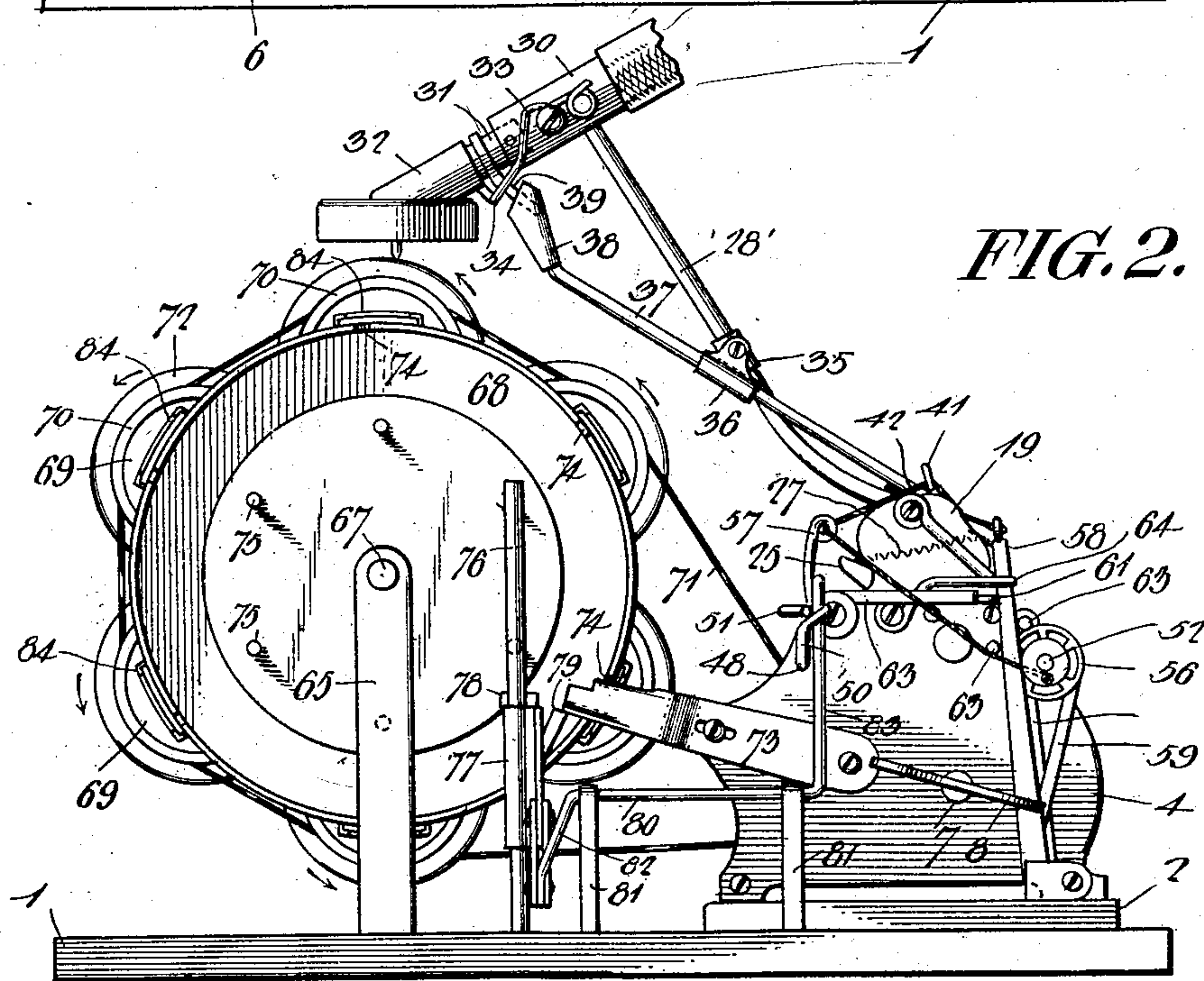


FIG. 2.



Witnesses

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2 Sheets—Sheet 2.

FIG. 3.

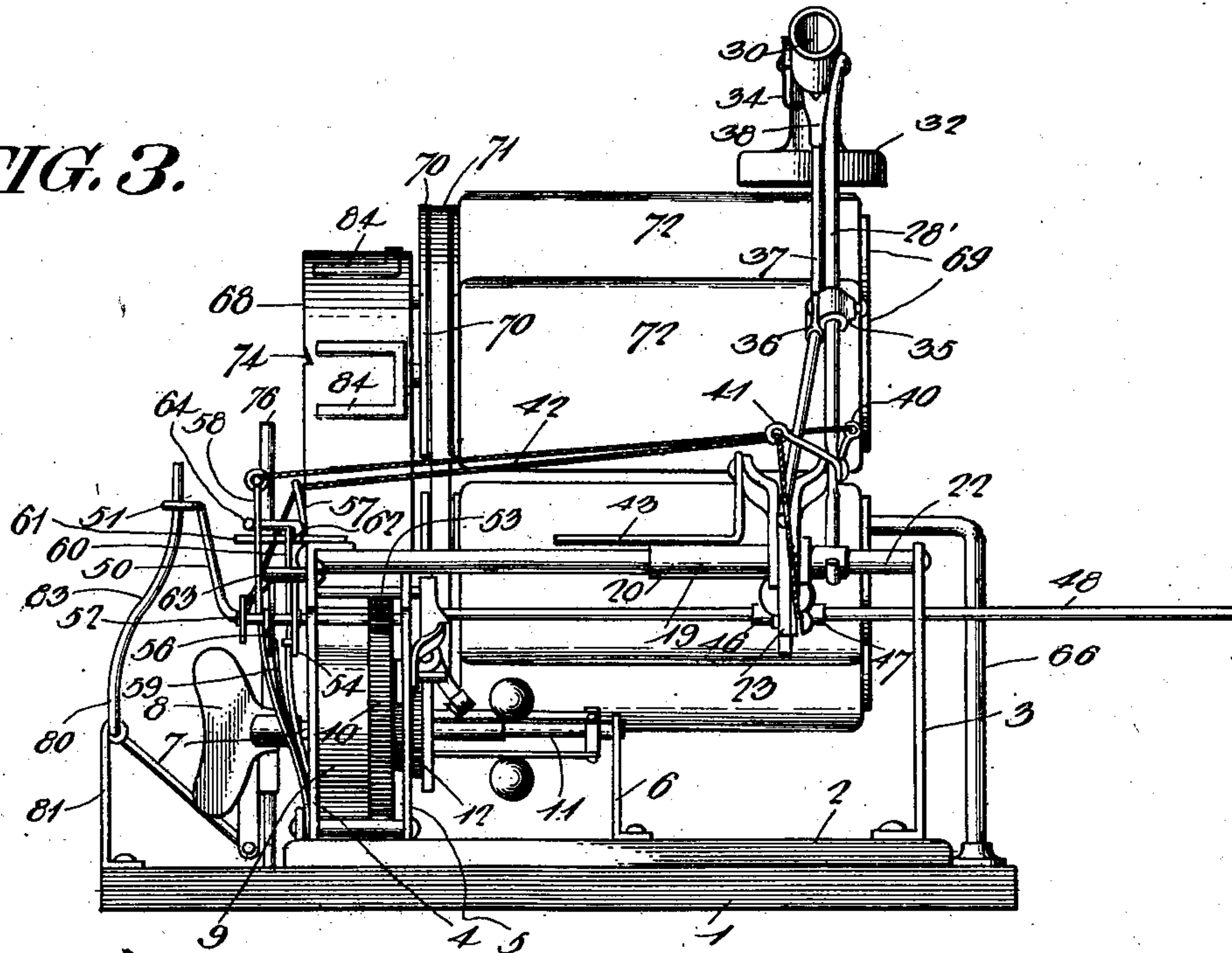


FIG. 4.

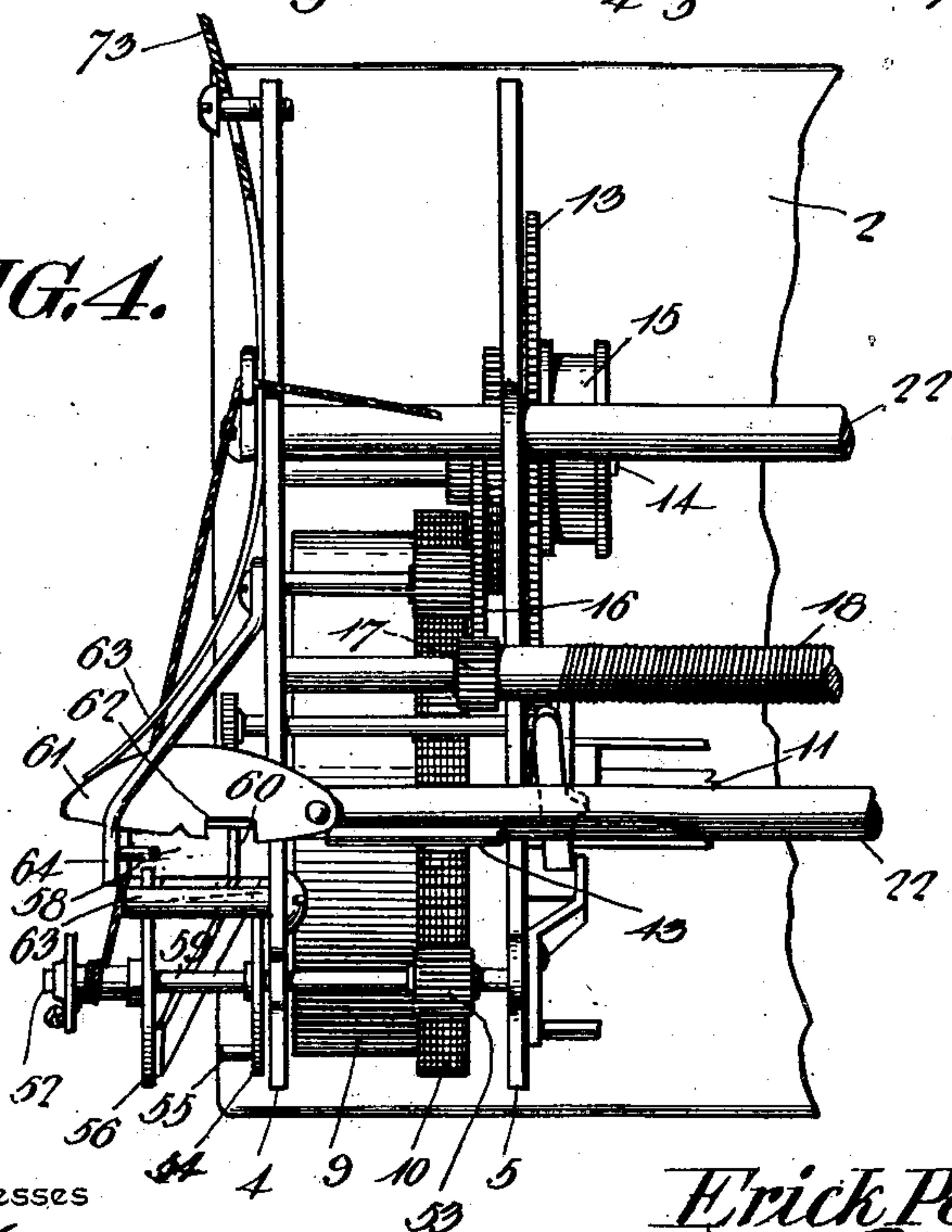
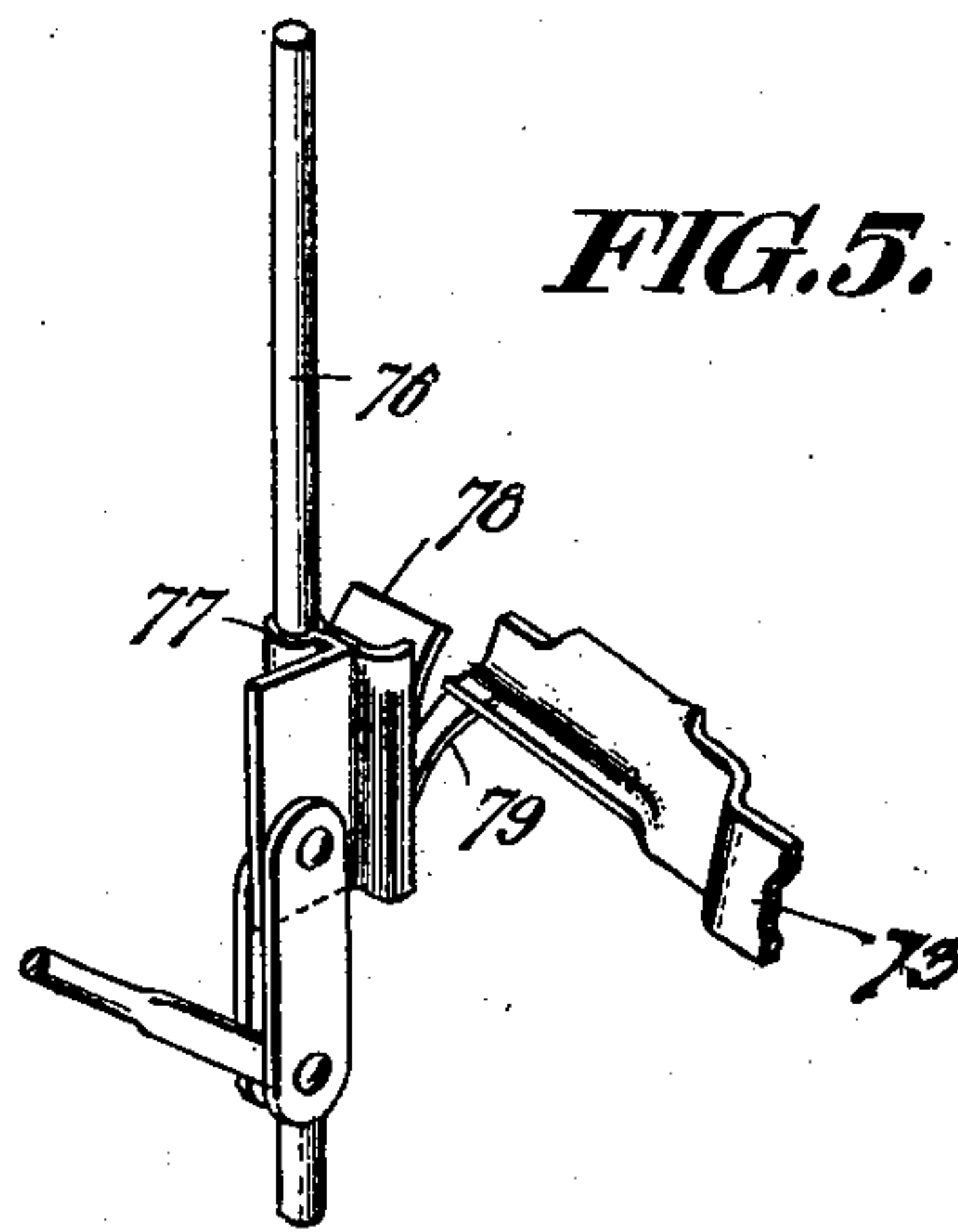


FIG. 5.



Witnesses

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# UNITED STATES PATENT OFFICE.

ERICK PERSON FELT, OF ALIDA, MINNESOTA, ASSIGNOR OF ONE-HALF TO  
CHARLES HENRY MILES, OF BEMIDJI, MINNESOTA.

## GRAPHOPHONE.

SPECIFICATION forming part of Letters Patent No. 701,697, dated June 3, 1902.

Application filed July 15, 1901. Serial No. 68,364. (No model.)

*To all whom it may concern:*

Be it known that I, ERICK PERSON FELT, a citizen of the United States, residing at Alida, in the county of Beltrami and State of Minnesota, have invented a new and useful Graphophone, of which the following is a specification.

This invention relates to graphophones, and particularly to means for supporting a plurality of record-cylinders and successively bringing said cylinders into proper position under the stylus through the actuation of a motor solely and without manual operation; and the purpose of the invention is to produce a graphophone wherein the matter from a number of records may be reproduced, the stylus and reproducer disengaged from operative relation to the records at the terminal of the latter in an automatic manner and returned to a starting position, and a motor device for controlling such operations having in connection therewith certain cooperating devices which are proportioned and arranged to carry out the several operations desired.

The invention consists in the construction and arrangement of the several parts, which will be more fully hereinafter described and claimed.

In the drawings, Figure 1 is a transverse vertical view through the improved graphophone with the carriage and the parts carried thereby arranged at a starting-point in relation to the records. Fig. 2 is a left end elevation of the improved device. Fig. 3 is a front elevation of the same. Fig. 4 is a top plan view of a portion of the device. Fig. 5 is a detail perspective view of a portion of the shifting mechanism for the record-carrier.

Similar numerals of reference are employed to indicate corresponding parts in the several views.

The numeral 1 designates a suitable base, which may be a portion of a casing on which the improved device is disposed, and on the front portion thereof is secured a base-plate 2, having a standard 3 rising from one end and a pair of separated upright plates at the opposite end, (indicated by the numerals 4 and 5,) and at a suitable distance from the inner plate 5 is a bearing upright 6. Between the plates 4 and 5 a spring-actuating device

is held on a winding-shaft 7, the latter being supplied with a suitable key or similar device 8 for winding the spring device, said spring device being held in a casing 9, which rotates therewith and has a gear 10 secured thereto. A shaft 11, provided with a suitable speed-regulating and starting or releasing and stopping devices, is actuated by the said spring device, and said shaft has thereon a pinion 12, which meshes with a spur-gear 13, fixed to a drive-shaft 14 in rear of the said shaft 11 and also provided with a flanged band wheel or pulley 15. The spring device or motor may be of any suitable form, and with the exception of the parts which will be specifically referred to in conjunction with certain novel mechanisms any preferred form of such motor may be employed, and at times an electric motor embodying the same specific features may be equally well used. The shaft 14 is operated by suitable gearing in part thereon between the plates 4 and 5 and in part actuated by the motor, the latter including in its organization compensating gearing to prevent too rapid run off of the spring, the speed controlling or governing mechanism on the shaft 11 also contributing largely to the attainment of this desirable result. The said motor also includes a gear 16, that meshes with a pinion 17 on a screw feed-rod 18, having bearing, respectively, in the upper portion of the outer plate 4 and of the standard 3 for the purpose of feeding the carriage 19, having guide devices 20 and 21 engaging guide-rods 22, terminally secured to the outer plate 4 and the standard 3, and between which the said screw feed-rod is located.

The carriage 19 has a release-arm 23 fulcrumed on the front guide device 20, with an outer weighted extremity to cause it to gravitate and throw the inner terminal 24 upwardly against the under portion of the screw feed-rod 18, and between the two upwardly-projecting supports of the carriage a feeding-grip 25 is pivotally mounted and has a lower concave recess 26, with a wall reduced to an edge to take into the threads of the rod 18, so that the carriage will be regularly fed over the said rod. The grip is pivoted near its rear extremity and has a spring 27 secured to the latter and to a portion of the carriage-sup-



ports near the front, said grip having a forwardly-extending member 28 between the carriage-supports for contact with a part of the arm 23 when the latter is elevated to thereby release the said grip and permit the carriage to slide back to a starting-point. The inner terminal 24 of the arm 23 does not fully extend across the under portion of the screw feed-rod 18; but said terminal has a projection across the under portion of the rod 18 only for such distance as to prevent loose movement or impositive action of the reduced edge of the feeding-grip 25 in relation to the said rod 18, and when the outer end of the arm 23 is elevated by the means which will be hereinafter explained the said terminal 24 will be drawn downwardly and outwardly away from the rod 18. A rigid support 28' rises from the carriage and has a rearward inclination, and to the upper end thereof a sound-conveying tube 30 is secured and held at a downward inclination, so that the front end thereof will be raised for the attachment of a tube or horn. In the rear end of the said tube 30 a coupling-tube 31 is pivotally mounted, and thereto the reproducer 32 is secured, the said tube 30 also having a spring-arm 33 secured thereto and provided with a rear depending transverse member 34 to serve as a cushion for a purpose which will presently appear. On the support 28' a clamp-collar 35 is adjustably mounted and carries an upwardly and rearwardly inclined guide 36, in which a slide-rod 37 is mounted, and has an upper terminal socket 38 to receive and operate in conjunction with a depending projection 39 from the coupling-tube 31. The lower extremity of the slide-rod 37 is held between the supports of the carriage and has its terminal in such forward position as to be engaged by the arm 23 when the latter is raised and push the slide-rod 37 upwardly. The upward movement of the slide-rod causes the upper terminal socket 38 to contact with the depending member 34 of the arm 33, and said member is brought into contact with the adjacent portion of the reproducer to raise the latter out of operative contact with the records. The weight of the reproducer is such that when the slide-rod is free to return to its normal position said reproducer will gravitate and depress the slide-rod, and thus reset the several devices for a subsequent elevating operation, as just explained. The carriage also has a wire post 39' or the like, to which a clutch cord or wire 40 is secured and runs to the left of the machine, and also attached to said carriage is a guide-eye 41, through which a cord 42 passes and is secured to the front weighted extremity of the arm 23, said cord 42 likewise extending to the left end of the machine. The carriage also has a trip-rod 43 extending from the front portion thereof a predetermined distance toward the left end of the machine, and depending from the rear guide device 21 of said carriage is a grooved roller 44, which bears against the under portion of the

rear guide-rod 22 to steady the movement of the carriage, the bearing 45 for said roller being rearwardly extended and caught between two adjustable set-collars 46 and 47 on an adjacent shifting rod 48, slidably mounted in the plates 4 and 5 and in a bearing-strip 49, projecting from the upper rear portion of the standard 3. The said rod 48 projects some distance beyond the left end of the machine and has an upward deflection 50, with an upper terminal horizontal loop 51.

At the upper front portion of the left end of the machine a short drum-actuating shaft 52 is mounted and operated by the motor through the medium of a pinion 53 thereon meshing with the gear 10, and on the extremity of the said shaft, close to the outer side of the plate 4, a clutch-disk 54 is secured and has an outwardly-projecting pin or projection 55 to engage the adjacent head of a winding-drum 56, loosely mounted on the outer extremity of said shaft 52. The cord 42 from the arm 23 of the carriage passes through a rear upwardly-projecting eye or guide 57, supported by the outer plate 4, and then runs to the drum 56 for winding or unwinding purposes, in accordance with the movement of the carriage. The cord or wire 40 is secured to the upper end of a spring shifting arm 58, secured to and located outside of the plate 4, the said arm engaging the inner head of the drum 56 when the cord or wire 40 is drawn taut to shift said drum into operative engagement with the disk 54 to cause the drum to rotate, the drum being moved toward the disk against the repellent action of a spring 59, secured to the plate 4 and operating to throw the drum out from the said disk when free to do so. It will be seen that when the drum is in engagement with the disk the shaft 52 rotates said drum to wind the cord 42 thereon, and by this means the carriage is returned to its normal position or starting-point. An unshipping-arm 60 is movably attached to the outer side of the plate 4 and is substantially in alignment with the arm 58 and is adapted to bear against the inner face of the inner head of the drum to throw the latter positively outward from the disk 54 and is engaged by the end of the rod 43. On the upper edge of the plate 4 is a horizontally-disposed pivoted latch 61, having a notch 62 in the front edge thereof and held in normal forward position by a spring 63 engaging the back edge thereof. When the carriage travels its full limit to the right, the wire or cord 40 pulls the arm 58 inwardly or toward the right into the said notch 62 of the latch 61, and the arm 58 also pushes the arm 60 inwardly therewith. The arms 58 and 60 remain in this locked position until the end of the rod 43 first strikes against the outer edge of the latch and releases the latter by pressing it back from the arms 58 and 60, and the latter being resilient are free to fly outwardly from the plate 4, the arm 60 in this movement engaging the



inner face of the inner head of the drum and is positively pressed outwardly by the rod 43. The arms 58 and 60 operate between outwardly-extending guide-pins 63, and the outward throw or movement of the arm 58 is limited by a stop-arm 64, projecting outside of the same.

In rear of the plates 4 and 5 and the carriage operating and supporting devices just described are a pair of bearing-standards 65 and 66, which support a longitudinally-extending spindle 67, having a rotatable head or disk 68 mounted thereon close to the left standard 65 and constructed of any material adapted for the purpose. The head or disk 68 carries a plurality of longitudinally-disposed cylinders 69, which are individually and independently rotatable and spaced apart from each other, the left ends of the cylinders having circumferentially-grooved heads 70 engaged by a belt 71 from the band wheel or pulley 15 of the shaft 14. These cylinders are adapted to removably receive wax or analogous records or tablets 72 and are so disposed in relation to the reproducer that when the latter is lowered into operating position it will contact with the record or tablet at the highest central point or that one which has its vertical diameter in alinement with the similar diameter of the said head or disk 68. The several cylinders and records or tablets will be successively brought up into this position by the step-by-step rotation of the head or disk 68, the latter and the cylinders and records moving in the direction of the arrows shown by Fig. 1. To prevent the head or disk 68 from having an impositive position after adjustment, so as to avoid injury to the records and also to cause a reproduction with accuracy and clearness, a spring-arm 73 projects rearwardly from the plate 4 and has a portion of the upper edge of the rear extremity thereof always in engagement with one of a series of notches 74 in the outer perimeter of the said head or disk 68, and on the same side or face of the latter near the center are a plurality of outwardly-projecting pins or studs 75 in circular alinement and corresponding in number to the number of cylinders carried by the head or disk. Close to the outer side of the head or disk and rising from the base is an upright rod 76, having a vertically-operating slide-pawl 77 thereon and provided with an inner upstanding lip 78 to engage the pins or studs 75, and projecting forwardly from the inner portion of the pawl is a trip-finger 79 to slip between the rear extremity of the spring-arm 73 and the outer side of the said head or disk 68 to disengage the said latter arm extremity from the notches 74 just in advance of the engagement of the individual pins or studs 75 by the lip 78 of the said slide-pawl. The movement of the said pawl is so timed by predetermined calculation that when it reaches the upper limit of its stroke the successive cylinders will be brought up to the highest plane and in position to bring

the reproducer in proper relation to the records or tablets thereon. The pawl 77 is operated by a crank-lever 80, movably held by upstanding bearing-arms 81, the said lever being provided with an inwardly-extending rear arm 82 and a front outwardly-projecting arm 83. The rear arm 82 is movably attached to the lower end of the said pawl 77, and the front arm loosely extends upwardly through the loop 51 of the shifting rod 48. As the latter rod is drawn to the right by the movement of the carriage the front arm 83 of the crank-lever 80 is drawn over to the right to fully lower the pawl 77 into position to engage the adjacent stud or pin 75 next in succession, and when the carriage has reached the limit of its movement and the stylus of the reproducer has fully traversed the record on the cylinder in position thereunder the arm 23 of the carriage is fully drawn up, the grip released, so the carriage is free to return over the feed screw-rod, and the reproducer raised, and at the same time the winding-drum 56 is thrown into operation and winds the cord 42 thereon. By this winding operation the cord draws the carriage to the left, and the shifting rod 48 is likewise drawn to the left and gradually turns the arm 83 of the crank-lever 80 outwardly, and consequently raises the arm 82 of said lever and elevates the pawl 77 to turn the head or disk 68 a sufficient distance to bring the successive cylinder and record into maximum elevated position. Just as this adjustment of the record occurs the arm 23 will have been released, the reproducer allowed to descend to normal position to bring the stylus in place on the new record, and the winding-drum 56 released and permitted to run loose to permit the carriage to again be fed toward the right. During this operation the motor is in continual motion and will continue to actuate the parts until run down or manually stopped, and by this means the matter carried by the several records or cylinders will be successively reproduced without manual attention or adjustment. The number of cylinders carried by the head or disk 68 can be varied at will and the wax or like records slipped thereover and carried thereby can be replaced when desired. It is also proposed to provide the rim of the head or disk 68 with suitable card-holders 84, which will be arranged directly opposite the several cylinders, as shown, to designate the character of the records.

The improved device will be found convenient and entertaining, and the parts will be inclosed in a case, as usual in this class of devices, so as to render them suitable for public use, and, moreover, it is intended to have the usual coin-controlled starting mechanism at times in connection therewith and suitable automatic stopping mechanism, so that when the full complement of records have been reproduced the machine will be stopped. It is also obvious that changes in the form, size, proportions, and minor details may be made



without departing from the principle of the invention.

Having thus described the invention, what is claimed as new is—

5 1. In a machine of the class set forth, the combination of a plurality of unitedly and individually rotatable record-holders, a carriage carrying a movably-mounted reproducer and also provided with a movable grip, a feed  
10 screw-rod engaged by the carriage, a gravitating arm pivoted to the front portion of the carriage and operating to release the grip when elevated, a slide-rod cooperating with the reproducer to raise the latter and with  
15 which said arm has contact, a cord connected to said arm, a winding-drum for said cord, a motor for actuating the several parts including the said drum, and means for shipping and unshipping the said drum.

20 2. In a machine of the class set forth, the combination of a plurality of unitedly and individually rotatable record-holders, a carriage supporting a movably-mounted reproducer and provided with a movable grip, a  
25 feed screw-rod for the carriage, a gravitating arm operative to release the grip, a slide-rod cooperating with the reproducer to raise the latter and with which said arm has contact, a motor for actuating the several parts, and  
30 means for automatically raising the arm, returning the carriage to a starting position after traveling its full limit over the several records, and permitting the arm to resume its normal position.

35 3. In a machine of the class set forth, the combination of a plurality of unitedly and individually rotatable record-holders, a carriage supporting a movably-mounted reproducer, a slide-rod cooperating with the repro-  
40 ducer to raise the latter, a pivoted arm adapted to engage the lower end of and move the said rod, a motor, and automatically-operating means for shifting the said arm to raise the reproducer and permit the rod to return  
45 to normal position during extreme opposite positions of the carriage.

4. A machine of the class set forth, comprising a plurality of unitedly and individually rotatable record-holders, a carriage having an  
50 automatically-movable reproducer, a motor for actuating the carriage and the holders, a drum-shaft operated by the motor and provided with a clutch device, a drum loosely mounted on the said shaft and adapted to be  
55 rotated with the latter by engagement with the clutch device, a resilient arm for moving the drum into engagement with the clutch device provided with a flexible connecting device running to the carriage, a resilient re-  
60 leasing-arm for the drum, a latch to engage said arms and a trip-rod carried by and movable with the carriage to engage said latch to release the arms and to push the releasing-arm to free the drum.

65 5. A machine of the class set forth, comprising a plurality of unitedly and individually

rotatable record-holders, a carriage having an automatically-movable reproducer and a gravitating arm, a motor for actuating the carriage and the holders, a winding-drum adapted to be actuated by the motor and capable  
70 of being thrown into and out of engagement with the motor, resilient arms for moving the drum into and out of operative engagement with relation to the motor, a flexible connection between the arm for moving the drum  
75 into operative engagement with the motor and the carriage, a cord between the arm of the carriage and the drum, a feed screw-rod engaged by the carriage, a spring-actuated  
80 grip in the carriage, the arm of the carriage operating when elevated to release the said grip and raise the reproducer, and a trip-rod secured to and movable with the carriage to release the drum from operative engagement  
85 with the motor.

6. In a reproducing-machine of the class set forth, the combination with a plurality of rotatable record-holders, of a motor operating a band-pulley, a belt engaging the hold-  
90 ers at one end and adapted to continuously rotate the same and also passing over said band-pulley, a series of records adapted to be mounted on the holders, a reproducer, a carriage supporting the same, means for re-  
95 ciprocating the carriage to traverse the reproducer longitudinally of a record, means for returning the carriage to initial position, and means for stopping the records successively in such position as to permit of the ac-  
100 tuation of the reproducer.

7. In a machine of the class set forth, the combination of a plurality of rotatable record-holders, a motor for actuating said holders, a screw feed-rod, a carriage movable over  
105 said feed-rod and having a pivoted spring-actuated grip to engage the latter, a gravitating arm mounted in the carriage and adapted to contact with a portion of the grip to release the latter, a reproducer supported by the car-  
110 riage, and means for automatically raising the arm when the carriage reaches its limit of movement in one direction and starts to return to an opposite extreme position.

8. In a machine of the class set forth, the  
115 combination of a plurality of rotatable record-holders, a carriage supporting a movable reproducer, a motor for actuating the holders and carriage, a disk carrying the holders and having outer projecting devices and notches,  
120 a spring-arm to engage the notches of the disk, a vertically-slidable pawl to engage the said projecting devices provided with a trip-finger to release said arm, a crank-lever connected to the pawl, and a shifting rod mov-  
125 able by the carriage and having one end loosely engaging the one extremity of the crank-lever.

9. In a machine of the class set forth, the combination of a plurality of rotatable record-  
130 holders, a carriage supporting a movable reproducer, a motor for actuating the holders

and carriage, a vertically-movable slide-pawl  
for bringing the successive holders into op-  
erative position with relation to the repro-  
ducer, and a shifting rod engaged by a por-  
5 tion of the carriage and movable by the lat-  
ter to impart reverse movements to the said  
pawl.

In testimony that I claim the foregoing as  
my own I have hereto affixed my signature in  
the presence of two witnesses.

ERICK PERSON FELT.

Witnesses:

WM. P. WELCH,  
THOS. MCCARTHY.