

No. 666,821.

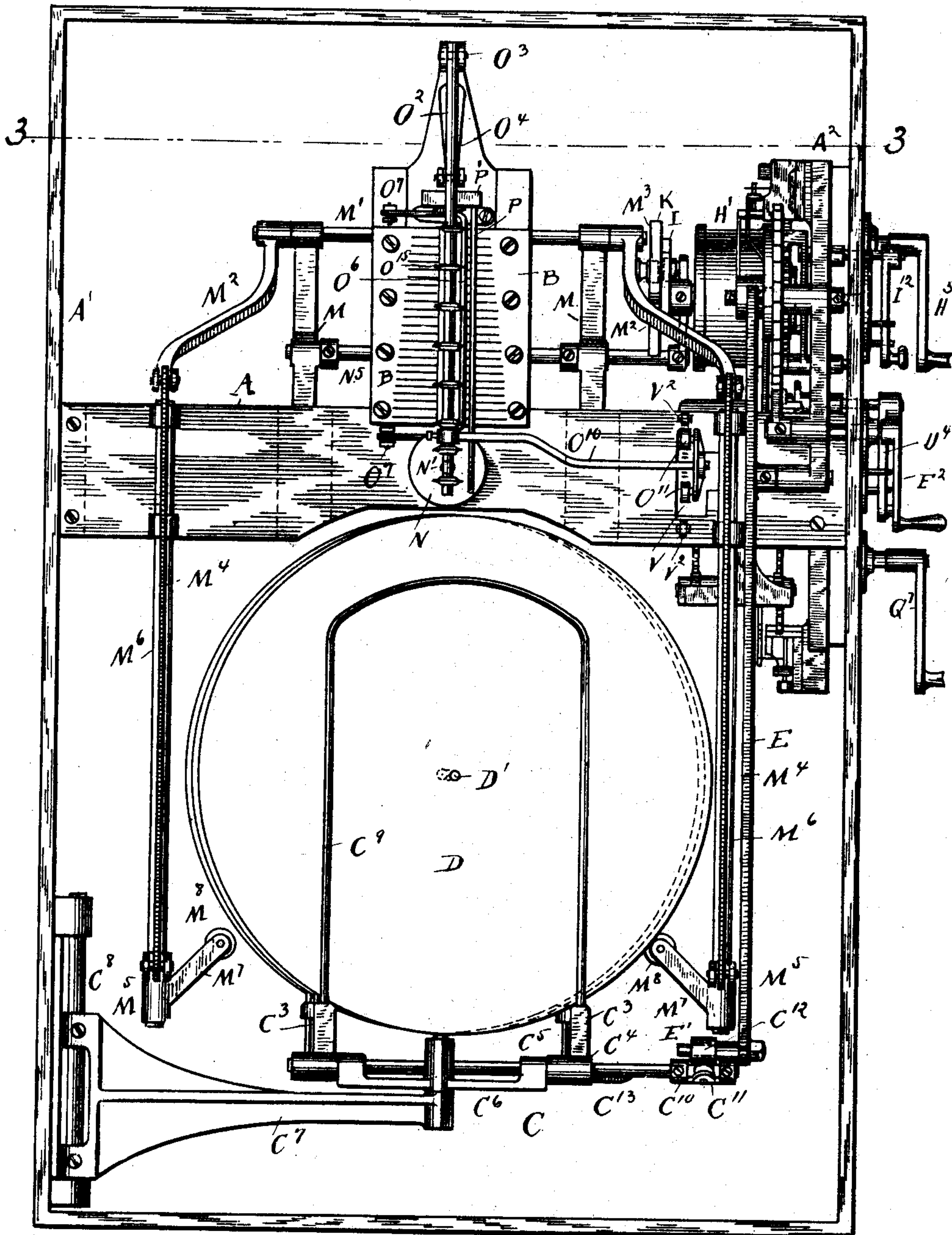
Patented Jan. 29, 1901.

F. SCHAUB.
MUSICAL INSTRUMENT.

(Application filed Sept. 5, 1899.)

(No Model.)

6 Sheets—Sheet 1.



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Fig. 1.

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6 Sheets—Sheet 2

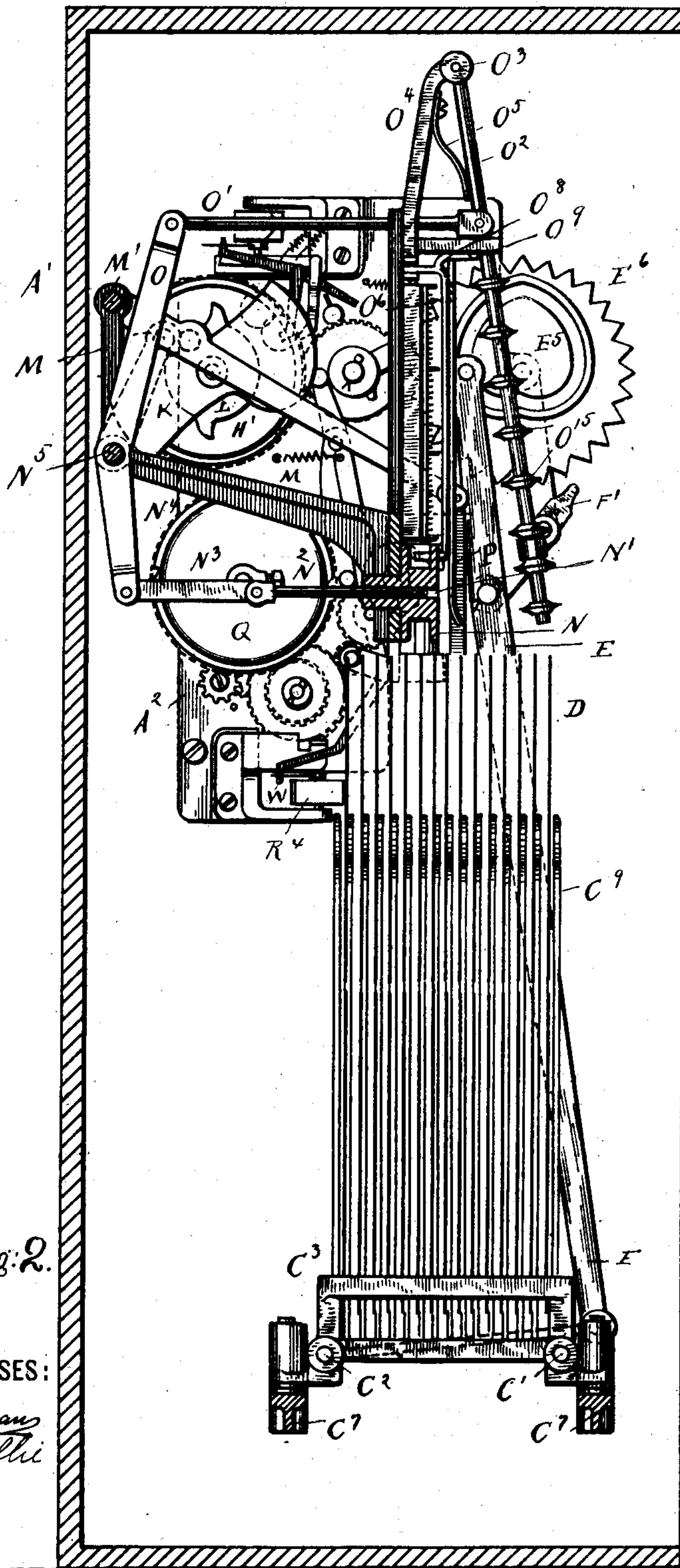


Fig. 2.

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(No Model.)

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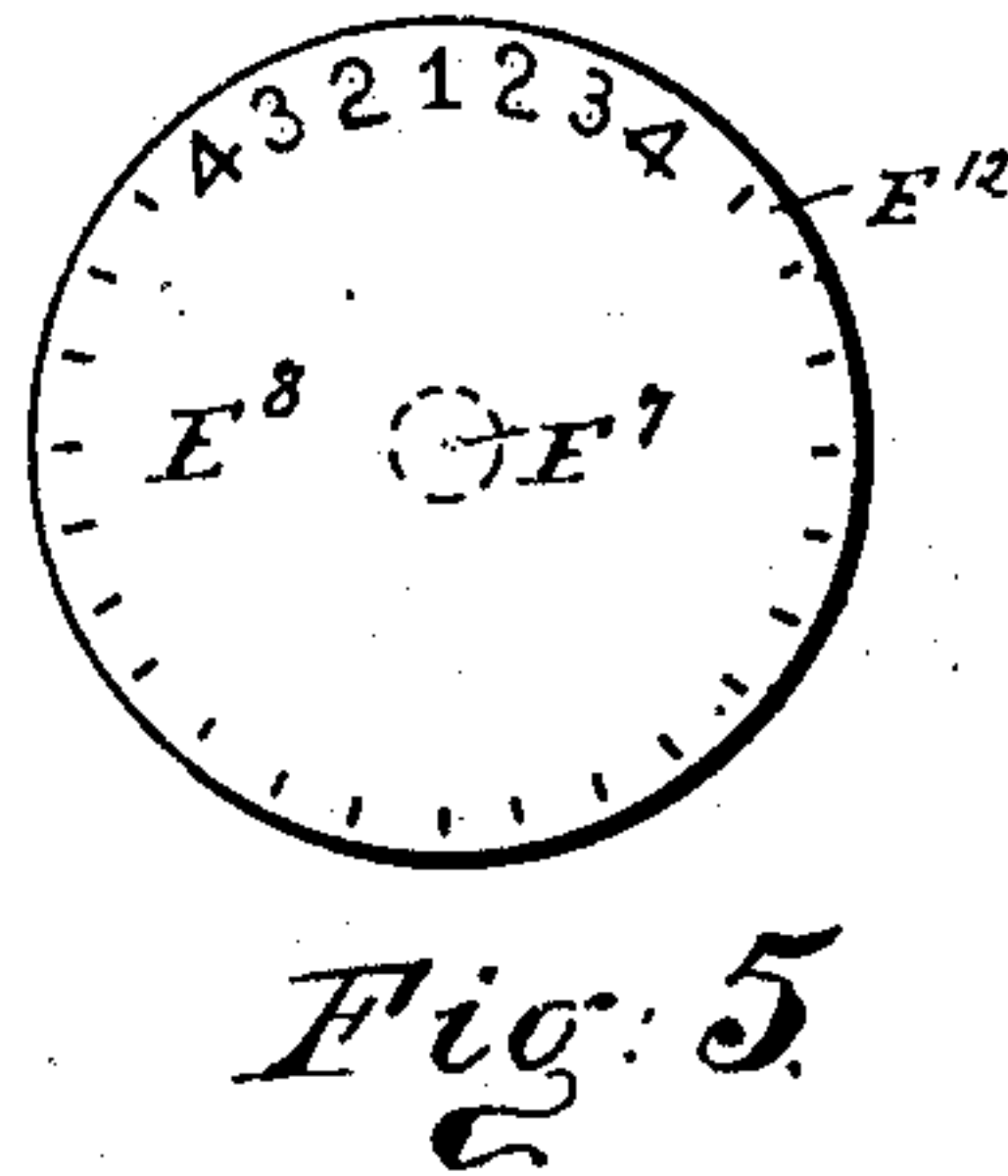
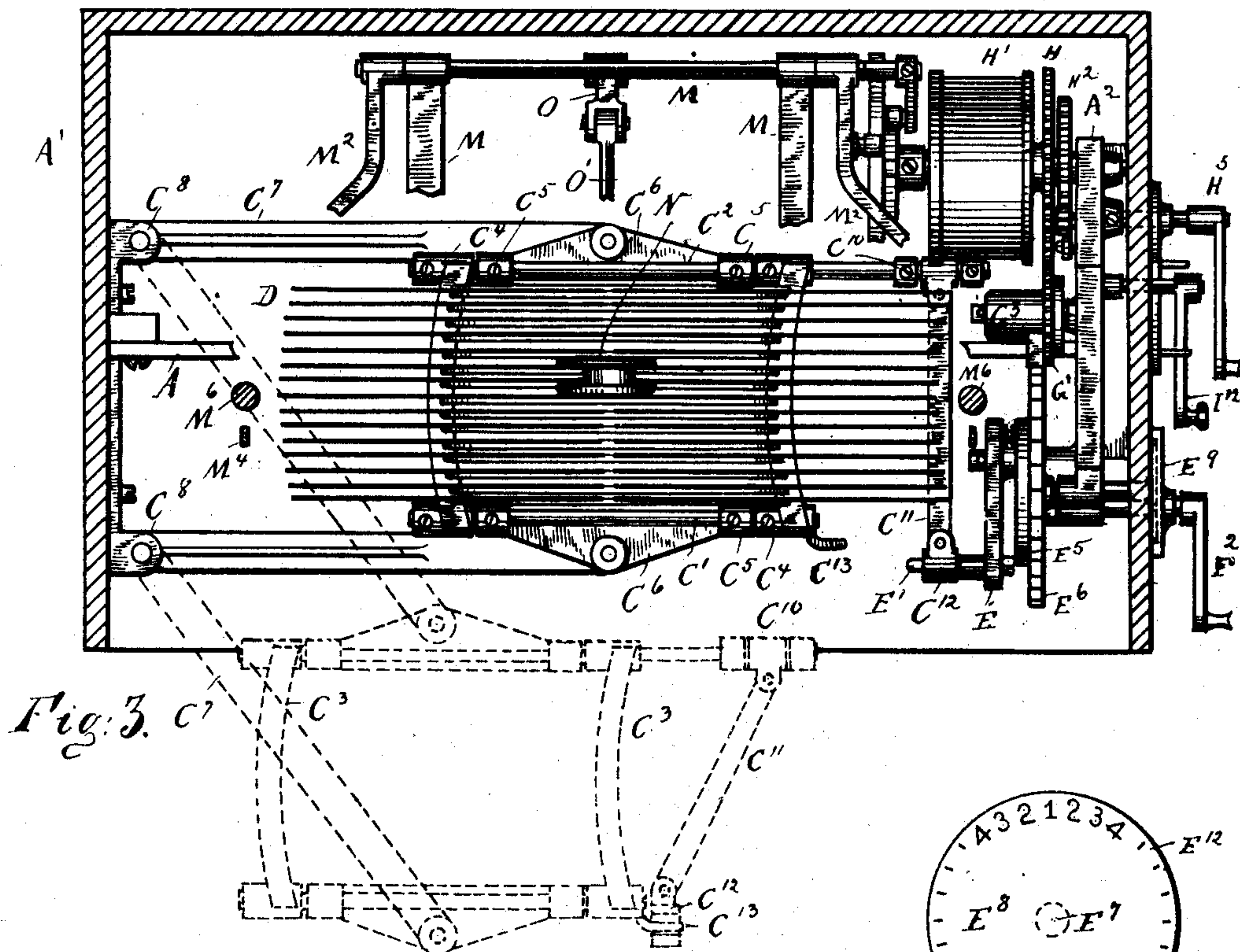
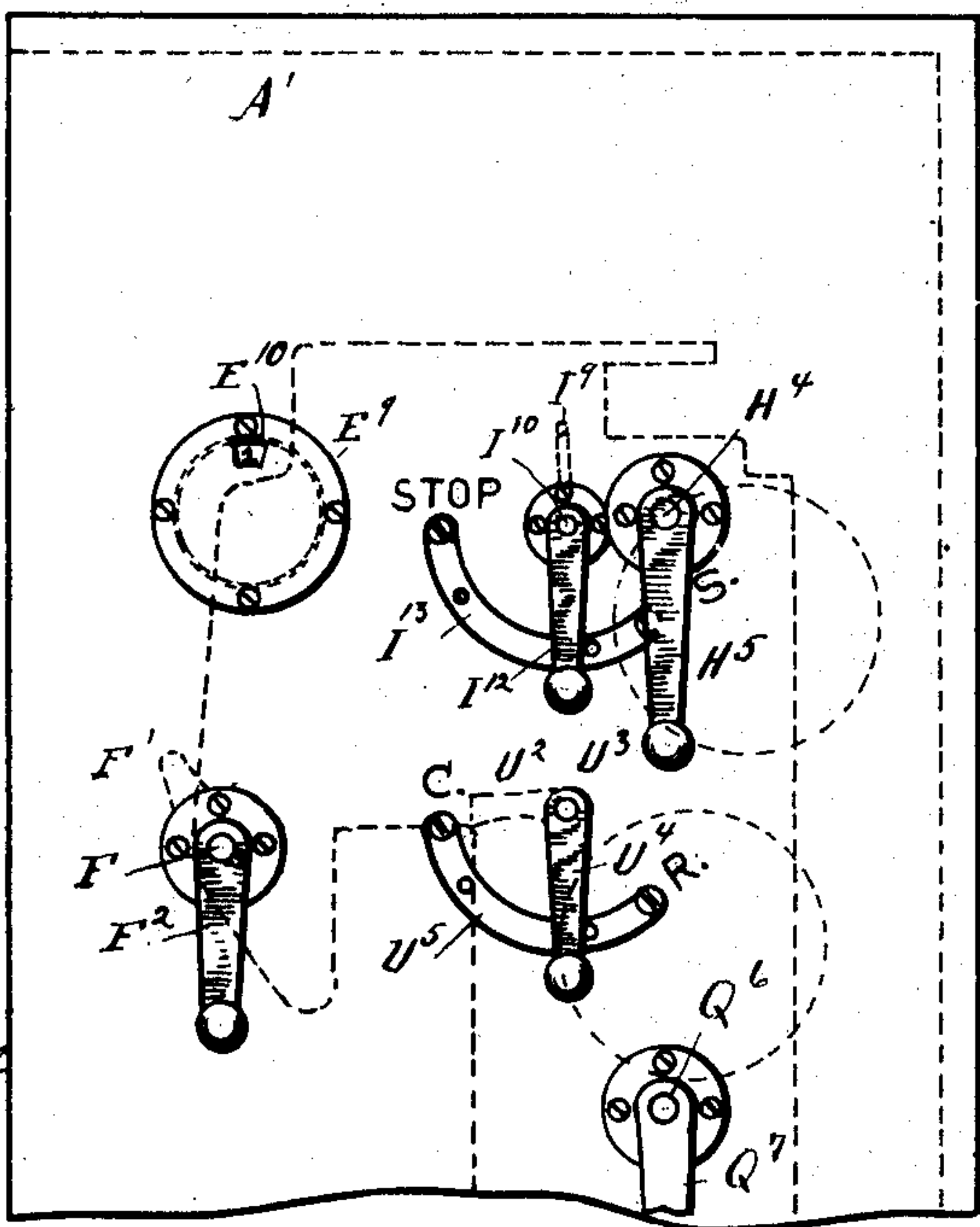


Fig. 4.



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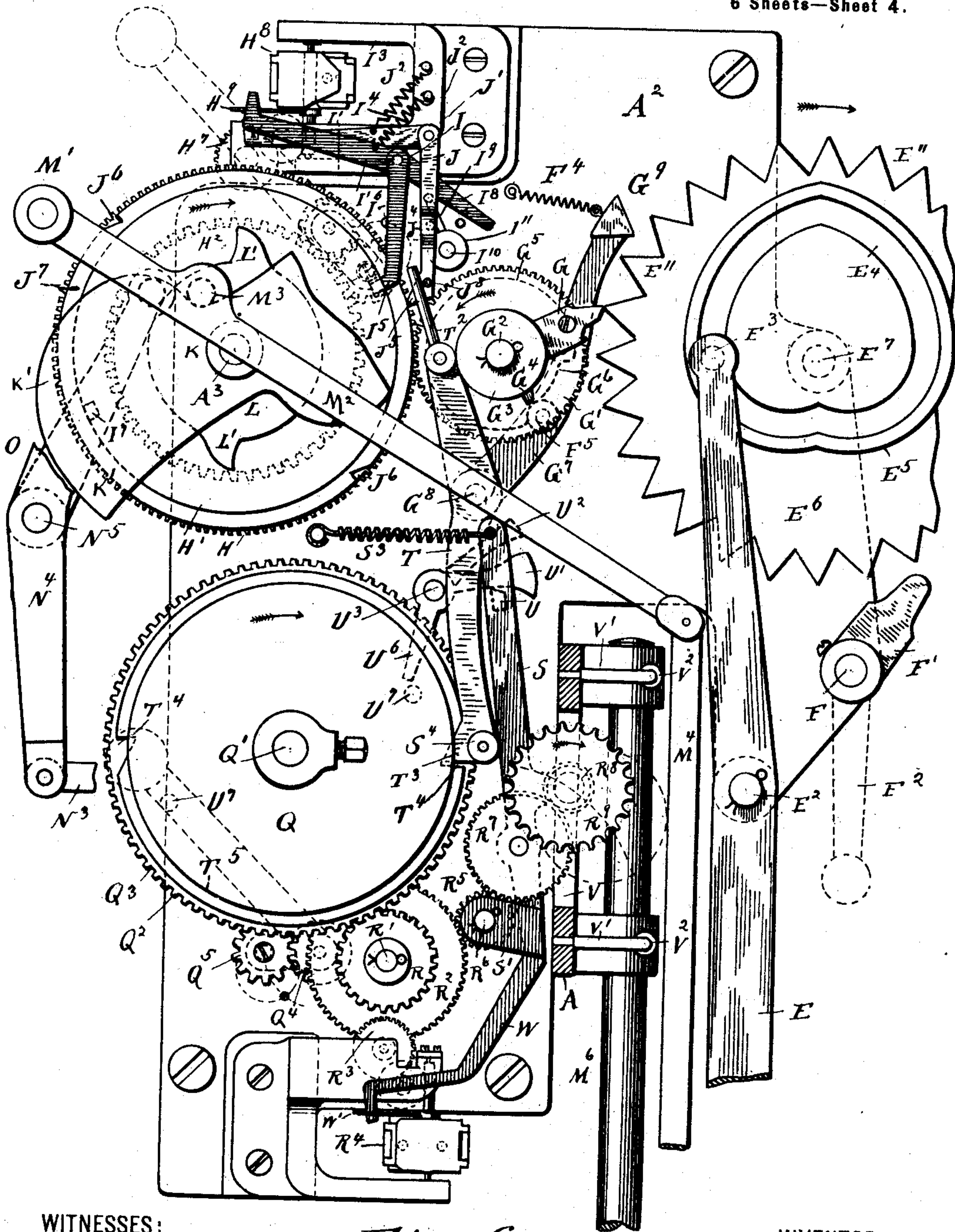
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F. SCHAUB.
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Fig. 6.

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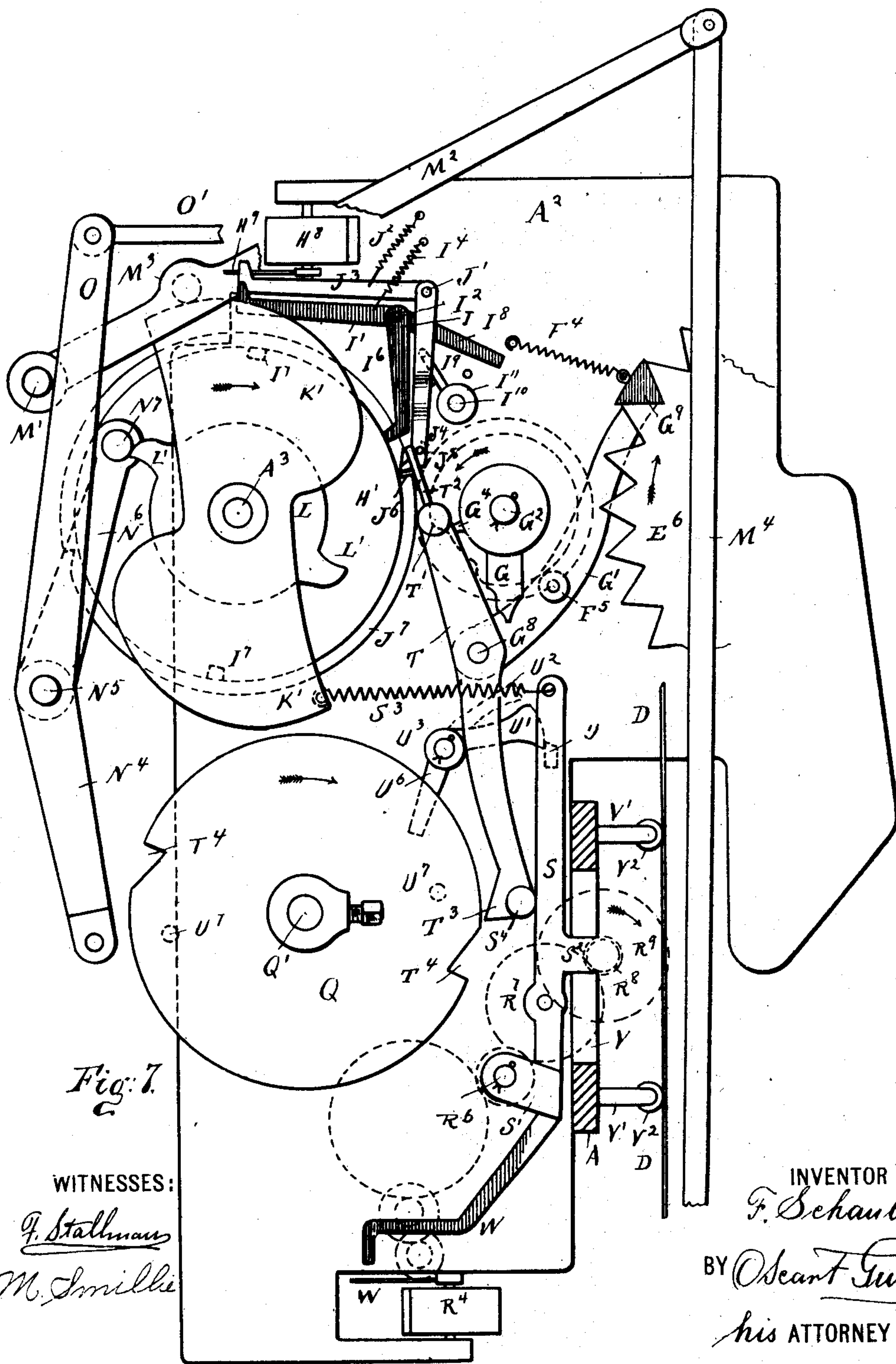
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F. SCHAUB.
MUSICAL INSTRUMENT.

(Application filed Sept. 5, 1899.)

(No Model.)

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F. SCHAUB.
MUSICAL INSTRUMENT.

(Application filed Sept. 5, 1899.)

(No Model.)

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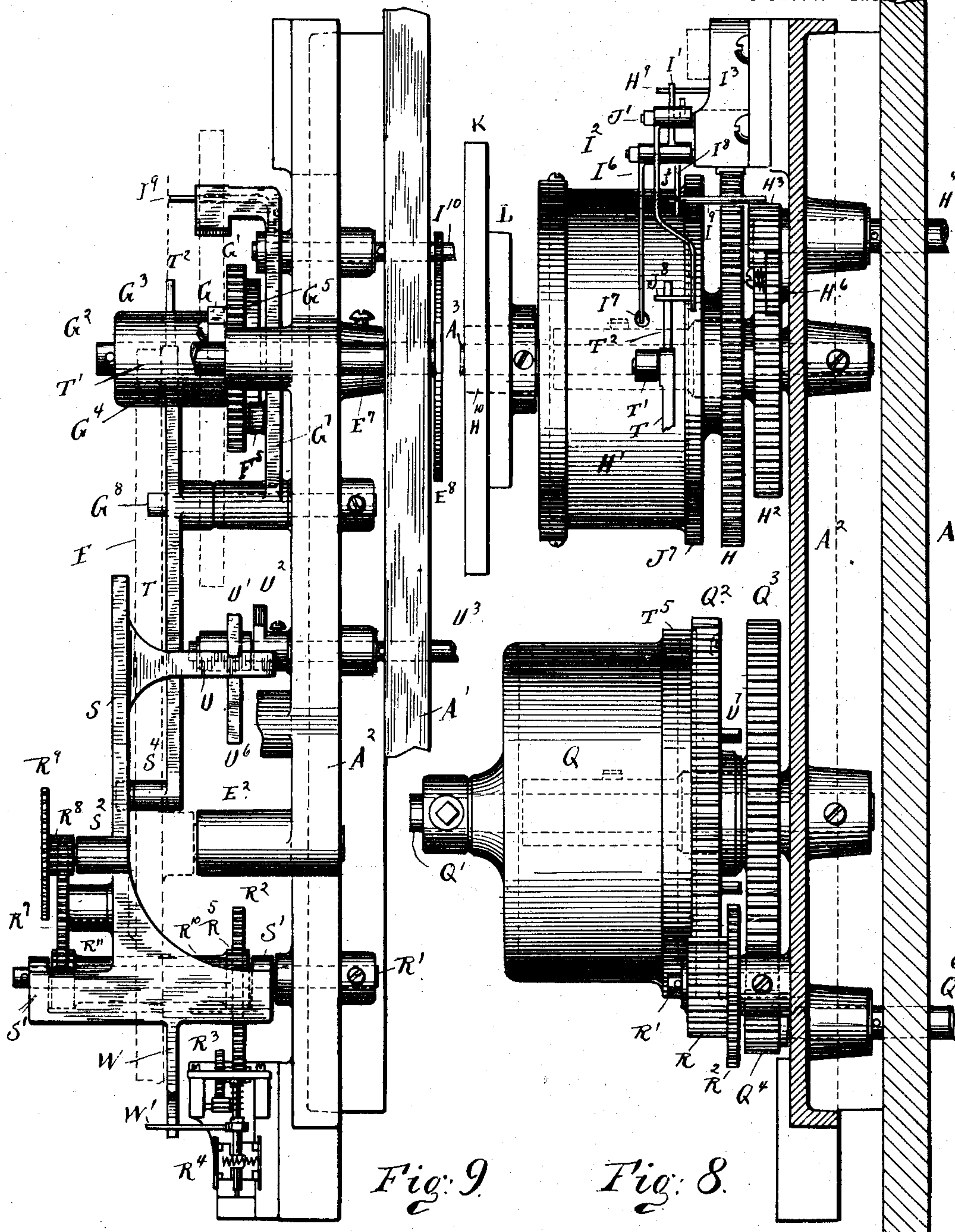


Fig. 9

Fig. 8

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UNITED STATES PATENT OFFICE.

FERDINAND SCHAUB, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE
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MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 666,821, dated January 29, 1901.

Application filed September 5, 1899. Serial No. 729,530. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND SCHAUB, a citizen of the United States, residing at 26 Hancock avenue, Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification.

This invention relates to improvements in mechanical musical instruments, and especially to musical instruments of that class having a sound-producing mechanism which is operated by rotating disks having slots or projections.

The object of my invention is to provide a new and improved musical instrument of this general kind which is simple in construction, strong and durable, reliable in action, permits of changing the playing-disk at will or automatically without in any way injuring or straining the mechanism of the instrument, and permits of rapidly and conveniently exchanging the playing-disks in the instrument for others.

In the accompanying drawings, forming a part of this specification, and in which like letters of reference indicate like parts in all the views, Figure 1 is a front elevation of my improved mechanical musical instrument. Fig. 2 is a central vertical transverse sectional view of the same. Fig. 3 is a horizontal sectional view of the same on the line 3-3 of Fig. 1, parts being broken away. Fig. 4 is an exterior view of the upper part of one side of the casing. Fig. 5 is a side view of the tune-indicating disk. Figs. 6 and 7 are enlarged detail side views of the two driving mechanisms and the changing mechanism, parts being shown in different positions in the two figures. Fig. 8 is a front elevation of the two spring-drums, the plate to which they are attached being shown in vertical section and parts being broken away. Fig. 9 is a front elevation of the automatic changing mechanism, parts being broken away.

The mechanical musical instrument is provided with a vertical metal base-plate or main plate A, which is fastened in a suitable casing or box A', of any suitable construction, and on this base-plate A the steel comb or combs B are secured in conventional manner

and combined with suitable picking devices—such, for example, as the well-known “star-wheels”—and these in turn are to be operated by disks D, provided with projections or slots for operating said picking devices or star-wheels, and such disks will be referred to hereinafter as “note-disks.” As shown, the combs B are arranged vertically on the base-plate A. The note-disks D are held vertically, in planes parallel with the base-plate, in a note-disk receptacle C, which is mounted to swing in a horizontal plane under the combs B and base-plate A. The note-disk receptacle consists of a frame substantially in the shape of a parallelogram, composed of the front bar C', the longer rear bar C², and the two connecting end bars C³, which connect sleeves C⁴, secured on the front and rear bars C' and C². Adjacent to the inner end of each sleeve C⁴ a sleeve C⁵ is secured on each bar C' and C², and the two sleeves C⁵ on each bar C' and C² are connected by a web C⁶. To the center of each web C⁶ a horizontal arm C⁷ is pivoted, the opposite ends of which arms C⁷ are pivoted on rods C⁸ on the inner surface of one of the side walls of the casing A', thus adapting the note-disk receptacle to swing horizontally. The two cross-bars or end bars C³ are curved segmentally in such a manner that the convex edges face the pivotal points of the arms C⁷. These cross-bars have their inner edges beveled to form a support for the edges of the note-disks D, and from said cross-bars a series of U-shaped guide-frames C⁹ extend upward vertically, one leg of each frame C⁹ being secured on one cross-bar C³ and the other leg on the other cross-bar. The note-disks D are placed vertically between such guide-frames C⁹, which hold them in vertical position and equidistant from each other, each disk D being placed between two frames C⁹.

The longer rear bar C² of the note-disk receptacle C has attached to its projecting right-hand end a sleeve C¹⁰, to which a link C¹¹ is pivoted to swing horizontally, which link is provided on its free end with an eye C¹², which can be placed upon a pin C¹³, projecting from the right-hand end of the shorter front bar C' of the receptacle C, and which eye can also be placed upon a pin E', projecting laterally

from the lower end of a lever E, fulcrumed at E² to the plate A², carrying part of the mechanism, and secured to the side of the casing A'. The upper end of the lever E carries a roller E³, which can travel in the heart-shaped groove E⁴ of a heart-cam E⁵, secured on or made integral with a toothed wheel E⁶, secured on the inner end of a short shaft E⁷, journaled in the side plate A² and carrying on its outer end, at the outer side of the casing A', a disk E⁸, which is covered by a plate or cup E⁹, having a slot E¹⁰ in its top part, as shown in Fig. 4. The toothed wheel E⁶ has twice as many teeth E¹¹ as note-disks D can be placed into the receptacle C minus two. For example, if the receptacle C can hold and contain fifteen note-disks D the wheel E⁶ must have twenty-eight teeth E¹¹, and the disk E⁸ has along its rim on its outer face as many equal subdivisions E¹² as there are teeth E¹¹ on the wheel E⁶, and these subdivisions are numbered, consecutively, "1," "2," "3," "4," &c., from "1" to the right and to the left, the first and last number, which are diametrically opposite each other, appearing once only. The uppermost number on the disk E⁸ always shows through the slot E¹⁰.

A short shaft F is journaled in the side plate A², and on its inner end a tooth F' is secured, which can engage the teeth E¹¹ of the wheel E⁶ in such a manner that for each rotation of the shaft F the wheel E⁶ is rotated the distance of one tooth E¹¹. A crank-handle F² is secured on the outer end of the shaft F for turning the same, and by means of it the toothed wheel E⁶ can be adjusted to bring any desired numeral on the disk E⁸ into the slot E¹⁰ of the plate or cup E⁹ and to move the note-disk receptacle C correspondingly by means of the heart-cam E⁵ and lever E. The teeth E¹¹ of the toothed wheel E⁶ can also be engaged by a tooth G, secured on the side of and projecting beyond the rim of a cog-wheel G', mounted on a stud G², projecting laterally from the side plate A², and from one side of said cog-wheel G' a neck G³ projects, which is provided with a cam projection G⁴. On the opposite face of the cog-wheel G' a cam-disk G⁵ is formed, which is provided in its rim with a cam-recess G⁶. A lever G⁷, fulcrumed on a pin G⁸ on the side plate A², is provided on its free upper end with a triangular tooth G⁹, which fits in between the teeth E¹¹ of the wheel E⁶ and can lock the latter. A helical spring F⁴, attached to the side plate A² and to the free end of the lever G⁷, holds the tooth G⁹ of the latter out of engagement with the teeth E¹¹ of the cog-wheel E⁶ and presses a roller F⁵ on the lever G⁷ against the rim of the cam-disk G⁵. The cog-wheel G' engages a cog-wheel H of twice the diameter of the cog-wheel G' and attached to the drum H' of a spring-motor provided with a spring-winding cog-wheel H², which latter is engaged by a winding-pin H³, secured on the inner end of a crank-shaft H⁴, journaled in the side

plate A² and provided on its outer end with a crank-handle H⁵. A spring-pressed pinion H⁶, which acts as a noiseless automatic locking-pawl, engages the pinion H³ and the winding cog-wheel H².

By a train of gearing H⁷, of any well-known construction, a fan or other governor H⁸, of any approved construction, is driven from the cog-wheel H and is provided with the arm H⁹, which can be engaged by the arm I' of the three-armed lever I, fulcrumed at I² on the frame I³ of the governor. A helical spring I⁴, attached to the frame I³ and the arm I', pulls the latter upward and presses a tooth I⁵ on the lower end of the downwardly-projecting arm I⁶ of the lever I against the periphery of the spring-drum H', which drum has two holes or recesses I⁷ for receiving said tooth I⁵, and thus locking the drum. The arm I⁸ of the lever can be pressed upward by an L-shaped pin I⁹, projecting from a hub I¹¹ on the inner end of a shaft I¹⁰, journaled in the side plate A² and provided on its outer end with a crank-handle I¹², which can swing over a sector-plate I¹³ on the outside of the casing A' and marked at its ends "Stop" and "S," the latter signifying "Start." An L-shaped lever J, fulcrumed at J', can also engage with its upper end the arm H⁹ of the fan-governor and is pulled upward by a helical spring J², attached to the upper arm J³, Fig. 7, of said lever J and to the frame I³ of the fan-governor. The lower end of the downwardly-projecting arm J⁴ of said lever J is shaped as a tooth J⁵, adapted to enter notches J⁶ in the raised rim part J⁷ of the spring-drum H', of which notches J⁶ there are two, diametrically opposite each other. A pin J⁸ projects laterally from the lower end of the arm J⁴ of the L-shaped lever J.

Two cams K and L are attached side by side to a collar H¹⁰ on one end of the spring-drum H', the cam K having two long diametrically opposite cam projections K' and the cam L two short diametrically opposite cam projections L'. The cams K and L, with the spring-drum H', turn on the pin A³, projecting from the side plate A².

The base-plate A is provided with two upwardly-inclined L-shaped arms M on its back, and in the upper ends of said arms the horizontal shaft M' is journaled, from which shaft two arms M² extend over the top of the base-plate A, of which arms one carries on its outer side a roller M³, which rests upon the rim of the large cam K. To the free end of each arm M² a connecting-rod M⁴ is pivoted, the lower end of each of which is pivoted to a sleeve M⁵, mounted to slide vertically on a guide-rod M⁶, attached to and extending downward vertically from the base-plate A. Each sleeve M⁵ has an upwardly and inwardly inclined arm M⁷, carrying a grooved roller M⁸ in its free end. The rollers M⁸ are such a distance from each other that the note-disks D when resting upon the note-disk receptacle

C can swing freely between said rollers with the receptacle C, but can lift a disk when the sleeves M⁵ are raised.

Directly below the combs B and in line with the longitudinal central line between them a note-disk support N is secured on the base-plate A and is provided with a central bore N', in which a pin N² is mounted to slide longitudinally, around which pin N² the note-disks D are to rotate while playing or operating the picking devices, each note-disk having a central hole D' for receiving said pin N². The pin N² is pivoted at its inner end to a connecting-rod N³, the opposite end of which is pivoted to the lower end of an arm N⁴ of a rock-shaft N⁵, journaled in the arms M, at the angles of said arms. The shaft N⁵ has an upwardly-projecting arm N⁶, carrying a roller N⁷, which rests upon the rim of the cam L. The shaft N⁵ also has an upwardly-extending arm O, to which the inner end of a connecting-rod O' is pivoted, the outer end of said rod O', which rod passes through a guide-hole in base-plate, being pivoted to the L-shaped retaining-bar O² a short distance below its upper end, which upper end is pivoted at O³ to an upwardly-extending bracket O⁴ of the base-plate. The retaining-bar is pressed outward by a spring O⁵, attached to the bracket O⁴, and said retaining-bar carries the usual rollers O¹⁵ on its downwardly-extending member and on the free end of its rectangular arm O¹⁰ carries the rollers O¹¹ for pressing the edge part of the disk on the driving-wheel. A U-shaped guide-rod O⁶ for the note-disks is pivoted at its ends O⁷ to the base-plate and is connected by a pivoted arm O⁸ to the retaining-bar O² at O⁹. A guide-rod P, slightly curved outward at its lower end, extends downward over one comb from a horizontal bracket P' of the base-plate and is a short distance from the face of the comb, as shown in Fig. 2.

A second spring-drum Q is mounted on a stud Q', projecting from the side plate A², and carries a cog-wheel Q² and is provided in the usual manner with a winding cog-wheel Q³, engaged by a winding-pinion Q⁴, which, as well as the winding cog-wheel, is engaged by a spring-pressed pinion Q⁵, which acts as an automatic pawl. The winding-pinion Q⁴ is secured on the inner end of a crank-shaft Q⁶, mounted in the side plate A² and provided at its outer end with a crank Q⁷ for turning it. The cog-wheel Q² on the spring-drum Q engages a pinion R, mounted on a stud R' of the side plate A² and united with a cog-wheel R², which engages and drives a train of gearing R³, which operates a fan or governor R⁴, of any well-known construction. The cog-wheel R² also engages a pinion R⁵, formed on one end of a sleeve R¹⁰, mounted on a stud R⁶ of the side plate A², and on the opposite end of this sleeve is formed a pinion R¹¹, which engages a cog-wheel R⁷, Fig. 9, pivotally mounted on the side of a lever S, fulcrumed, by means of its arms S', on the

stud R⁶, and the cog-wheel R⁷ engages a pinion R⁸, made integral with a toothed disk driving-wheel R⁹, mounted to turn on the arm S² of the lever S. The toothed wheel R⁹ is adapted to engage holes or teeth formed along the rim of the note-disk D for the purpose of rotating such disk from the rim. A helical spring S³ has one end attached to the side plate A² and the other end to the upper end of the lever S and presses said lever against a roller S⁴ on the lower end of a lever T, fulcrumed on the stud G⁸ and provided at its upper end with a roller T', which bears against the neck G³ on the cog-wheel G'. A pin T² extends upward from the upper end of the lever T and can act on the laterally-projecting pin J⁸ on the arm J⁴ of the L-shaped lever J. The lower end of the lever T is shaped as a tooth T³, which can enter notches T⁴ in the raised rim T⁵ of the spring-drum Q, of which notches T⁴ there are two, diametrically opposite each other. The lever S has a laterally-projecting arm U, which can be engaged by the arms U' and U² of a short shaft U³, mounted in the side plate A and provided at its outer end with a crank-handle U⁴ for turning it, which crank-handle can swing over a sector-plate U⁵ on the outside of the casing A', which sector-plate is marked at one end "C," signifying "Change," and at the other end "R," signifying "Repeat." The shaft U³ is provided with a third arm U⁶, which can be tripped when in a certain position by two diametrically opposite pins U⁷ on one end of the spring-drum Q.

The base-plate A is provided with a vertical slot V, through which the toothed driving-wheel R⁹ can move in the direction from front to rear of the base-plate, as indicated by full and dotted lines in Figs. 6 and 7. At each end of this slot V a horizontally outwardly projecting pin V' is fastened on the base-plate, and each pin carries on its outer end a roller V², upon which the note-disk D can rest while rotating and playing.

The lever S has an angular downwardly-extending arm W, which can engage the arm or pin W' of the fan or governor R⁴.

The cross-bars C³ of the note-disk receptacle C are curved segmentally, so that the distance from the plane of the pivots of the carriage to said bars is smallest at the central line of the carriage and greatest at the front and rear of the carriage. It is evident that if these bars were made straight the central disks would be the proper distance from the pivots when the center of the carriage is vertically below the comb; but if such carriage were swung to the front or rear it is evident that the front and rear disks would swing in the arc of a circle, and thereby as they approached the center would be moved a greater distance from the plane through the pivots, and hence would not be in proper position for elevating. It is to avoid this difficulty that these bars are curved, so that when the front and rear disks arrive in vertical position below the combs they will not be shifted

laterally, but will have precisely the same position that the middle disks had.

The operation is as follows: To place the note-disks D into the receptacle C, the eye C¹² on the front end of the link C¹¹ is moved off the pin E' on the lower end of the lever E and placed upon the pin C¹³, on the front right-hand corner of the note-disk receptacle C, as shown in dotted lines in Fig. 2, and now the receptacle C can readily be swung to the front of the casing A' and the note-disks in the same removed and replaced by others. The receptacle C is then swung back into the casing A' and the link C¹¹ is again engaged with the pin E' on the lower end of the lever E. To start the instrument, the crank-handle I¹² is shifted downward and to the right, Fig. 4, and thereby the pin I⁹ is moved upward to the right, Fig. 6, and raises the arm I⁸ of the lever I, whereby the arm I' of this lever is forced down and releases the fan or governor H⁸, and at the same time the tooth I⁵ on the lower end of the arm I⁶ of the lever I is lifted out of the hole I⁷ in the spring-drum H', and the latter is thus free to rotate in the direction of its arrow, Fig. 6, under the action of its spring and rotates the cams K and L and the cog-wheel G'. As soon as the wheel G' begins to rotate the cam G⁵ by acting on the roller F⁵ of the lever G⁷ forces the tooth G⁹ on said lever G⁷ in between two teeth E¹¹ of the wheel E⁶, thus locking this wheel, the heart-cam E⁵, the lever E, and the note-disk receptacle C positively and reliably in place, and thus for the time being preventing any and all movements of such locked parts. One cam-wing K' acting on the roller M³ on the one arm M² lifts the same, and thereby the sleeves M⁵ are raised on the guide-rods M⁶, and in their upward movement the grooved rollers M⁸ encounter the edge of the note-disk D directly above them, whereby said disk is lifted vertically, being guided by the guide-frames C⁹. By the time the said note-disk has been raised so high that its central hole D' registers with the bore of the support N the roller M³ on the arm M² travels on a concentric part of the cam edge and the disk D is raised no farther. The disk D is also guided by the rod P, which prevents accidental movement away from the combs B, and by the U-shaped guide-rod O⁶, which prevents the projections on the disk D from striking against the pickers or the comb-tongues and damaging any of these parts. As the upper part of the rising disk is guided between said rods P and O⁶ it is conducted into the proper position without mutilating any parts. By this time the cam L by acting on the roller N⁷ on the end of the arm N⁶ has pushed the pin N² into the hole D' in the center of the disk D and by means of the arm O of the rock-shaft N⁵ and the connecting-link O' has pressed the retaining-bar O² against the action of its spring O⁵ upon the raised disk and pressed the same against the rollers V² and other supporting-rollers as are usually provided in instruments of this kind. As the retaining-bar

swings toward the combs it also swings the U-shaped guide-bar O⁶ toward the main plate A by means of the pivoted arm O⁸, so that this guide-bar clears the projections on the inner side of the note-disk. A short time before this the cam projection G⁴ on the neck G³ of the toothed wheel G' has pressed the upper end of the lever T to the left, Fig. 7, causing the lower end of said lever T to press the upper end of the lever S to the right, Fig. 6, whereby the arm W on the lower end of the lever S is raised and disengaged from the arm W' of the governor R⁴. As the tooth T³ has been moved out of the recess T⁴ in the raised rim of the spring-drum Q, the latter is released and is turned by its spring and rotates the driving-wheel R⁹ by means of the intermediate gearing described. By the movement of the upper end of the lever S to the right the driving-wheel R⁹ has been moved from the position shown in full lines in Fig. 6 to the position shown in dotted lines and can thus engage the teeth or holes in the rim part of the note-disk that has just been raised and mounted on the central pin N², and thus rotates this disk, and the teeth or slots of the same operate the music-comb pickers. By the movement of the upper end of the lever T to the left the pin T² has been moved away from the pin J³ on the arm J⁴ of the angle-lever J, and when a notch or recess J⁶ of the spring-drum H arrives at the tooth J⁵ the spring J² throws the said tooth J⁵ on the end of the arm J⁴ into this notch, and at the same time the upper arm J³ of the lever J is thrown upward and engages the arm H⁹ of the governor H⁸, thus locking the latter. It is thus evident that after the spring-drum H and the mechanism connected therewith have raised a note-disk and mounted the same in place the said drum is locked, while the drum for operating the sound-producing mechanism is rotated, having been started a short time before the drum H was stopped. When the drum Q has made half a turn, the spring S³ presses the tooth T³ into a notch T⁴, whereby the arm W is moved downward and stops the governor R⁴, and the driving-wheel R⁹ is moved from the position shown in dotted lines in Figs. 6 and 7 into the position shown in full lines in Fig. 6, it being understood that the means for "changing" or "repeating" a tune have not been considered. By the movements just described of the lever T the angle-lever J is disengaged from the drum H and governor H⁸, and the mechanism for changing the tune-disks is thus started. The cam wing or projection L' passes off the roller N⁷ on the arm N⁶, permitting the spring O⁵ to throw the retaining-bar O² outward, whereby the pin N² is withdrawn from the disk and the roller M³ of the arm M² passes off the end of the cam-wing K' and slides down the concave edge of said wing, permitting the note-disk D that has been rotated to descend with the sleeves M⁵ supporting it. By the time this note-disk

has arrived on the note-disk receptacle C the recess G⁶ of the cam G⁵ on the wheel G' has arrived at the roller F⁵ of the lever G⁷, permitting the spring F⁴ to move said lever to the left, whereby the tooth G⁹ is temporarily disengaged from the wheel G', and immediately thereafter the tooth G on said wheel G' turns this wheel E⁶ the distance of one tooth, and by means of the heart-cam E⁵ and lever E the note-disk receptacle C is moved forward or backward the distance of one disk. By that time the other end of the recess G⁶ has arrived at the roller F⁵ on the lever G⁷ and presses the same to the right, whereby the tooth G⁹ is again engaged with the teeth of the wheel E⁶ and locks the latter. Then a cam-wing K' begins to act on the arms M², which are raised, and the note-disk D, which has just been shifted into position over the rollers M⁸, is raised and mounted in proper position for playing, as previously described, and then the disk-rotating mechanism is started automatically again, and a short time thereafter the disk elevating and lowering mechanism is locked, and so on. When it is desired to stop playing, the lever I¹² is moved to "Stop" on the sector-plate, whereby the pin I⁹ is brought into the position shown in full lines in Fig. 6, permitting the tooth I⁵ on the arm I⁶ of the lever I to snap into a hole I⁷ in the drum H when said hole arrives at said tooth I⁵, and at the same time the free end of the arm I' snaps upward, engages the arm H⁹ of the governor H⁸, and locks the latter.

If the note-disks are to be changed after having played once in the manner just described, the handle U⁴ must be shifted to the letter "C" on the sector-plate U⁵, Fig. 4, whereby the arms U', U², and U⁶ on the short shaft U³ are moved into the position shown in Figs. 6 and 7, and the arm U', by engaging the arm U of the lever S, holds the latter and the parts thereon in the position shown in Fig. 7. The pins U⁷ on the drum Q strike against the arm U⁶ and throw the arm U' upward and off the arm U of the lever S, permitting the spring S³ to throw the tooth T³ of the lever T into the notch T⁴ of the drum Q, and thus stop the playing mechanism and start the note-disk elevating and lowering mechanism in the manner described, and so on. The arm U' is so heavy that it drops sufficiently to engage the arm U when the latter has been moved to the right, Fig. 6, beyond the end of the arm U', thus temporarily locking the lever S in place. On the other hand, when it is desired to repeat a melody indefinitely the crank-handle U⁴ is turned to "R" on the sector-plate U⁵, Fig. 4, whereby the arm U² is brought into the position shown in Fig. 4 and engages the arm U of the lever S and holds the latter and the parts thereon and the lever T permanently in the positions shown in Fig. 7, thus leaving the playing mechanism free to operate an indefinite time and keeping the disk-changing mechanism locked. With the arm U² in this position

the arm U⁶ clears the pins U⁷ on the drum Q and cannot be tripped by said pins. As shown in Fig. 6, the tooth G⁹ does not engage the teeth of the wheel E⁶ when the motor of the disk-changing mechanism is locked by the lever I, and thus it is possible to turn the wheel E⁶ by means of the crank-handle F² and tooth F' to bring any desired note-disk into position to be elevated; but as soon as the motor of the disk-changing mechanism is released the tooth G⁹ is engaged with the wheel E⁶ and locks the latter in place until the disk that has been raised is brought back into its original position in the note-disk receptacle.

I have shown and described but not claimed several of the mechanisms shown, described, and claimed in the present application in two other applications relating also to mechanical musical instruments filed contemporaneously herewith for the purpose of clearly illustrating the subject-matter of said two applications.

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

1. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a receptacle for the note-disks, and two horizontally-swinging arms pivoted to the receptacle and to a suitable support, and means for conveying the disks from said receptacle into playing position and from playing position into said receptacle, substantially as herein shown and described.

2. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a receptacle for the note-disks, and two horizontally-swinging arms, pivoted to a suitable support and to the front and rear of the receptacle, and means for conveying the disks from said receptacle into playing position and from playing position into said receptacle, substantially as herein shown and described.

3. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a receptacle for the note-disks, pivoted arms supporting the receptacle to swing in the horizontal plane, and means for shifting said receptacle, substantially as herein shown and described.

4. In a mechanical musical instrument, the combination with a music-producing mechanism, of a horizontally-movable note-disk receptacle, a lever for moving the same forward and backward, and a detachable link connecting the receptacle and said lever, the carriage having a laterally-extending pin on which the end of said lever can be applied, substantially as herein shown and described.

5. In a mechanical musical instrument, the combination with a music-producing mechanism, of a horizontally-movable note-disk

receptacle, a lever for moving the same forward or backward, a link pivoted to the support, to swing laterally and with the support and means for applying the front end of said link on the end of said lever or a front part of the receptacle, substantially as herein shown and described.

6. In a mechanical musical instrument, the combination with a music-producing mechanism, of a horizontally-movable note-disk receptacle, a lever for shifting the latter, a heart-cam acting on said lever, a toothed wheel carrying the heart-cam, means for rotating the toothed wheel and a link connecting said lever and receptacle, which link is detachable from the lever, and a pin on the carriage for receiving the free end of said link when disconnected from the lever, substantially as herein shown and described.

7. In a mechanical musical instrument, the combination with a music-producing mechanism, of a horizontally-swinging note-disk receptacle having segmental cross-bars on which the edges of note-disks can rest, substantially as herein shown and described.

8. In a mechanical musical instrument, the combination with a music-producing mechanism, of a horizontally-swinging note-disk receptacle, having segmental cross-bars for supporting the disks, the convex edges of said cross-bars facing the pivotal support of the receptacle, substantially as herein shown and described.

9. In a mechanical musical instrument, the combination with a music-producing mechanism, of a horizontally-swinging note-disk support, two parallel pivoted arms, pivoted to the front and rear respectively of said support and segmental cross-bars on said receptacle for supporting the disks, substantially as herein shown and described.

10. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a motor mechanism for changing the note-disks, a disk-driving wheel mounted to move toward and from the plane in which the disks rotate, and a separate motor for operating said driving-wheel, substantially as herein shown and described.

11. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a driving-wheel for rotating the disks, a support for said driving-wheel, which support is mounted to move toward and from the disk and a motor for operating said driving-wheel, substantially as herein shown and described.

12. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a motor and mechanism for changing the note-disks, a driving-wheel for rotating the disks, a lever carrying said driving-wheel and movable toward and from the disk to be rotated, means for shifting said lever from the motor of the note-disk-exchanging mechanism

and a separate motor for operating the driving-wheel, substantially as herein shown and described.

13. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a motor and mechanism for changing the note-disks, a driving-wheel for rotating the disks, a lever carrying said driving-wheel and movable toward and from the disk to be rotated, means for shifting said lever from the motor of the note-disk-exchanging mechanism, a separate motor for operating the driving-wheel, a governor driven by said motor and an arm on the lever carrying the driving-wheel, for stopping said governor, substantially as herein shown and described.

14. In a mechanical musical instrument, the combination with a music producing mechanism, adapted to be operated by note-disks, of a note-disk receptacle, a motor and mechanism for shifting the receptacle and elevating and lowering the note-disks, a separate motor for rotating the note-disks, a lever for locking either motor, one at a time, and a second lever acted upon by the first lever and also acting on the same, and a disk-driving wheel on said second lever, substantially as herein shown and described.

15. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a note-disk receptacle, a motor and mechanism for shifting the receptacle and elevating and lowering the note-disks, a separate motor for rotating the note-disks, a lever on which the disk-changing motor can act, a second lever acted upon by the first-mentioned lever, a disk-driving wheel on this second lever and a locking device for holding this second lever in locked position and preventing movement of the same, substantially as herein shown and described.

16. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by a note-disk, of a note-disk receptacle, a motor and mechanism for shifting the receptacle and elevating and lowering the note-disks, a separate motor for rotating the note-disks, a lever on which the disk-changing motor can act, a second lever acted upon by the first-mentioned lever, a disk-driving wheel on this second lever, a shaft having three arms, two of which can engage an arm of the second lever, and pins on the disk-rotating motor, for tripping the third arm of said shaft and means for setting said shaft, substantially as herein shown and described.

17. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a note-disk receptacle, means for shifting said receptacle, a toothed wheel for operating said means, a motor, a cog-wheel driven by said motor, a tooth on said cog-wheel for engaging the toothed wheel, a cam on said cog-

wheel and a locking-lever for the toothed wheel which locking-lever is actuated by the cam on said cog-wheel, substantially as herein shown and described.

5 18. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a movable note-disk receptacle, means for raising and lowering note-disks from and into
10 said receptacle, a motor for operating these means, a separate motor for rotating the disks, when in playing position, means for shifting the note-disk receptacle, a toothed wheel for operating said means, a cog-wheel driven from
15 the disk elevating and lowering motor, a tooth on said cog-wheel for rotating the toothed wheel, a neck on said cog-wheel, a cam projection on said neck, a lever on which said cam projection can act, which lever can lock the
20 disk-rotating motor, a governor driven by the disk elevating and lowering motor, a lever for locking said governor, which governor-locking lever is controlled by the lever that can lock the disk-rotating motor, substantially as
25 herein shown and described.

19. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by note-disks, of a note-disk receptacle, means for shifting
30 the note-disk receptacle and for raising and lowering the note-disks, a motor for operating said means, a governor driven by said motor, two independent levers for locking said governor and motor, an independent motor for
35 rotating the note-disks, when in raised position, means for throwing one of the locking-levers for the governor of the disk-changing motor, into inoperative position, by hand, and means for shifting the other one of said gov-
40 ernor-locking levers automatically, substantially as herein shown and described.

20. The combination, in a mechanical musical instrument, having a comb and pickers, which are adapted to be operated by a disk
45 rotating over the same, of an L-shaped retaining-bar, for holding said disk in place, substantially as herein shown and described.

21. The combination, in a mechanical musical instrument, having a comb and pickers,
50 which are adapted to be operated by a disk rotating over the same, of an L-shaped retaining-bar pivoted at one end, substantially as herein shown and described.

22. The combination, in a mechanical musical instrument, having a comb and pickers,
55 which are adapted to be operated by a disk rotating over the same, of an L-shaped retaining-bar having a series of rollers on one limb and rollers on the free end of the other
60 limb, substantially as herein shown and described.

23. The combination, in a mechanical musical instrument, having a comb and pickers, which are adapted to be operated by a disk
65 rotating over the same, of an L-shaped retaining-bar, pivoted at one end, carrying a series of rollers on the pivoted limb and rollers on the free end of the other limb, substantially as herein shown and described.

24. The combination, in a mechanical musical instrument, having a comb and pickers,
70 which are adapted to be operated by a disk rotating over the same, of an L-shaped retaining-bar and means for automatically swinging the retaining-bar toward and from
75 the plane of the combs, substantially as herein shown and described.

25. In a mechanical musical instrument the combination with a music-producing mechanism adapted to be operated by rotating
80 disks, of a movable receptacle for a series of such disks, means for shifting said receptacle, vertically-guided supports for raising and lowering said disks a rock-shaft, arms
85 on the same, connecting-rods, connecting the arms on the rock-shaft, with the vertically-movable supports, substantially as herein shown and described.

26. In a mechanical musical instrument having a steel comb, and adapted to be oper-
90 ated by rotating note-disks, the combination with a disk-retaining bar, of a guide extending over the comb and mounted to move toward and from the same and means for shifting
95 said guide, substantially as herein shown and described.

27. In a mechanical musical instrument having a steel comb, and adapted to be oper-
ated by rotating note-disks, the combination with a disk-retaining bar, of a hinged guide
100 extending over the comb and mounted to move toward and from the same and means for shifting said guide from the retaining-bar, substantially as herein shown and de-
105 scribed.

28. In a mechanical musical instrument, the combination with a music-producing mechanism, adapted to be operated by a rotating
disk, of a retaining-bar at one end to swing
110 from and toward the face of the instrument, a spring for throwing it outward and connecting-rod for moving it inward against the tension of the spring, substantially as herein shown and described.

Signed at Jersey City, in the county of Hudson and State of New Jersey, this 15th day of
115 August, A. D. 1899.

FERDINAND SCHAUB.

Witnesses:

ALBERT LANCELOT,
STEPHAN TRITSCHLER.