

(No Model.)

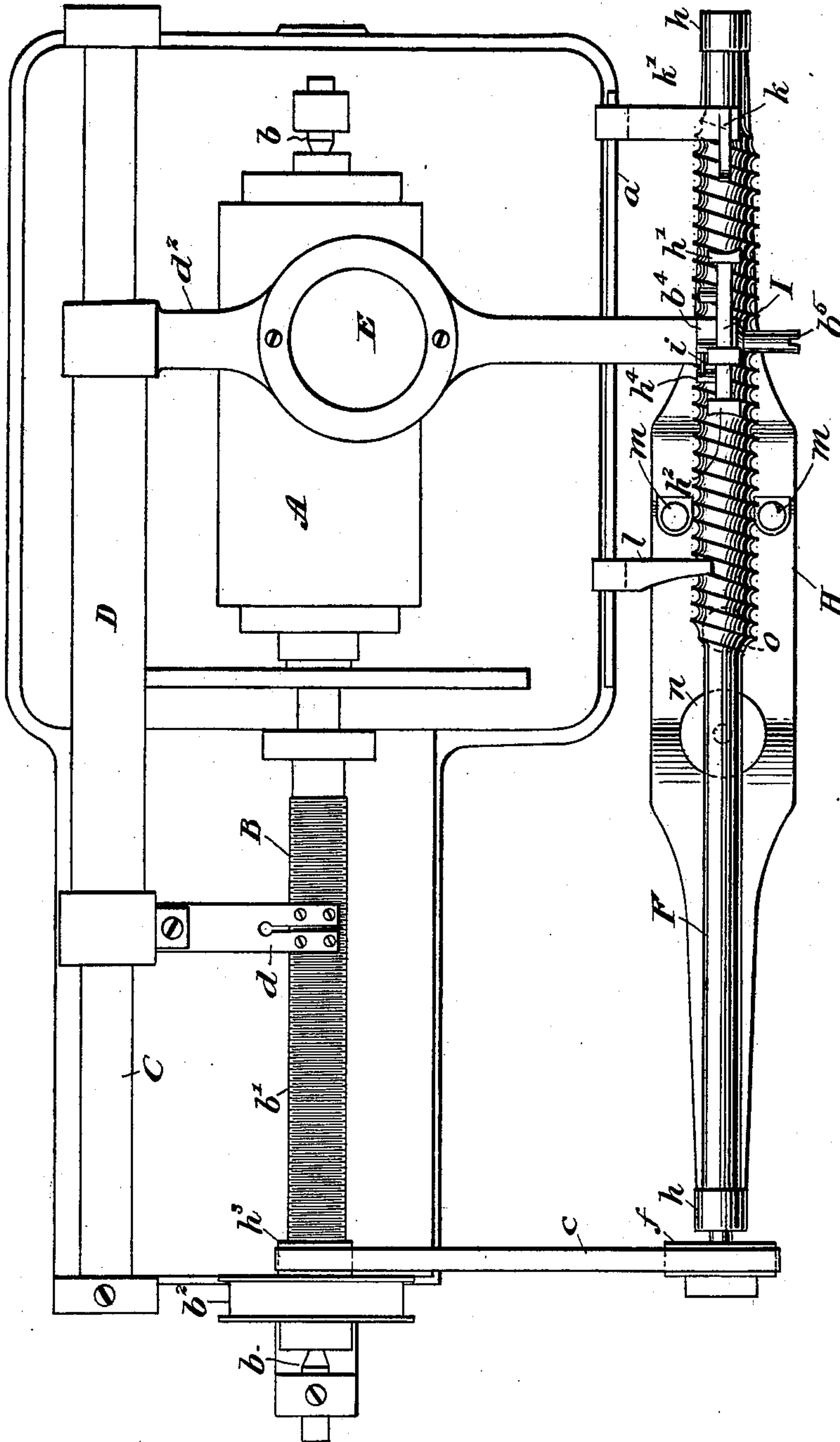
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T. L. DENNIS, Jr.
PHONOGRAPH.

No. 590,643.

Patented Sept. 28, 1897.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

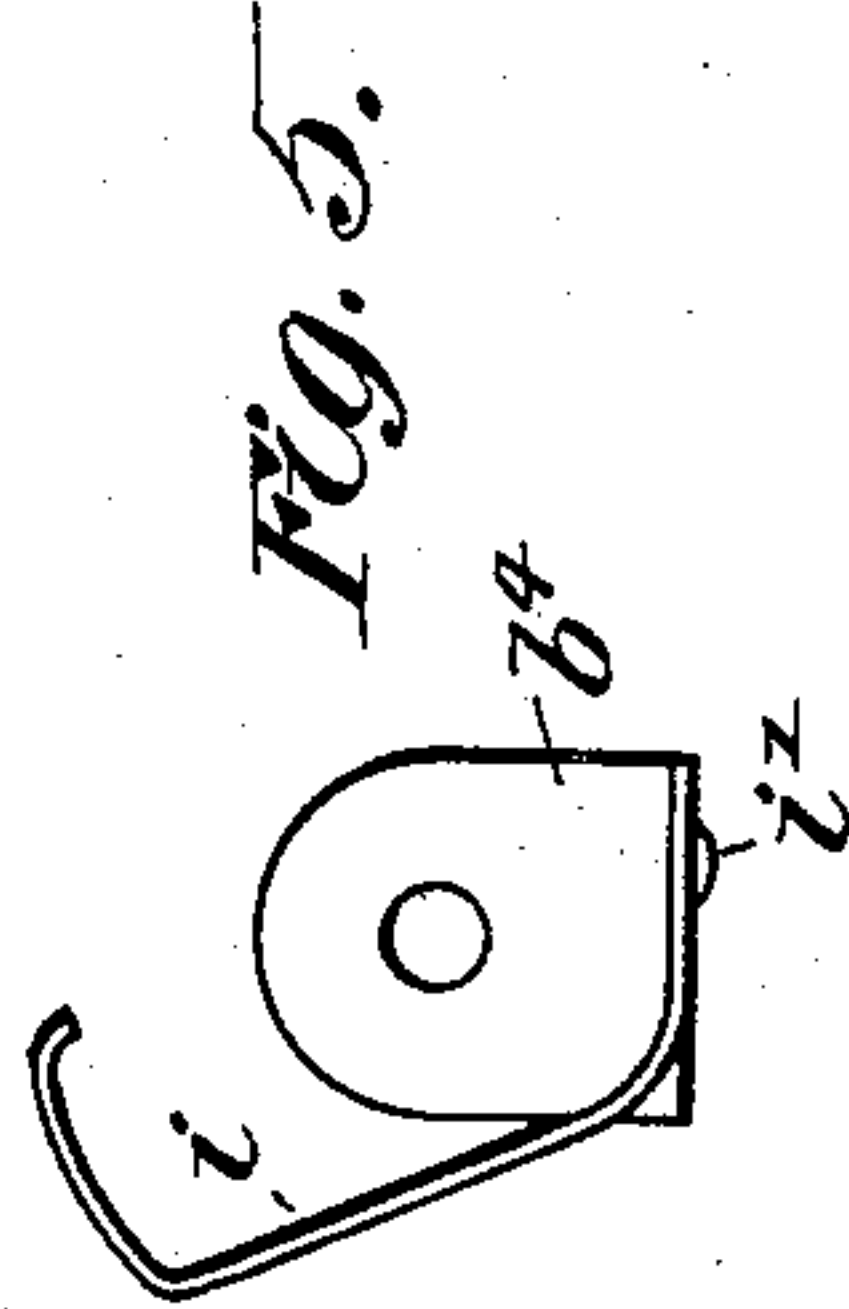
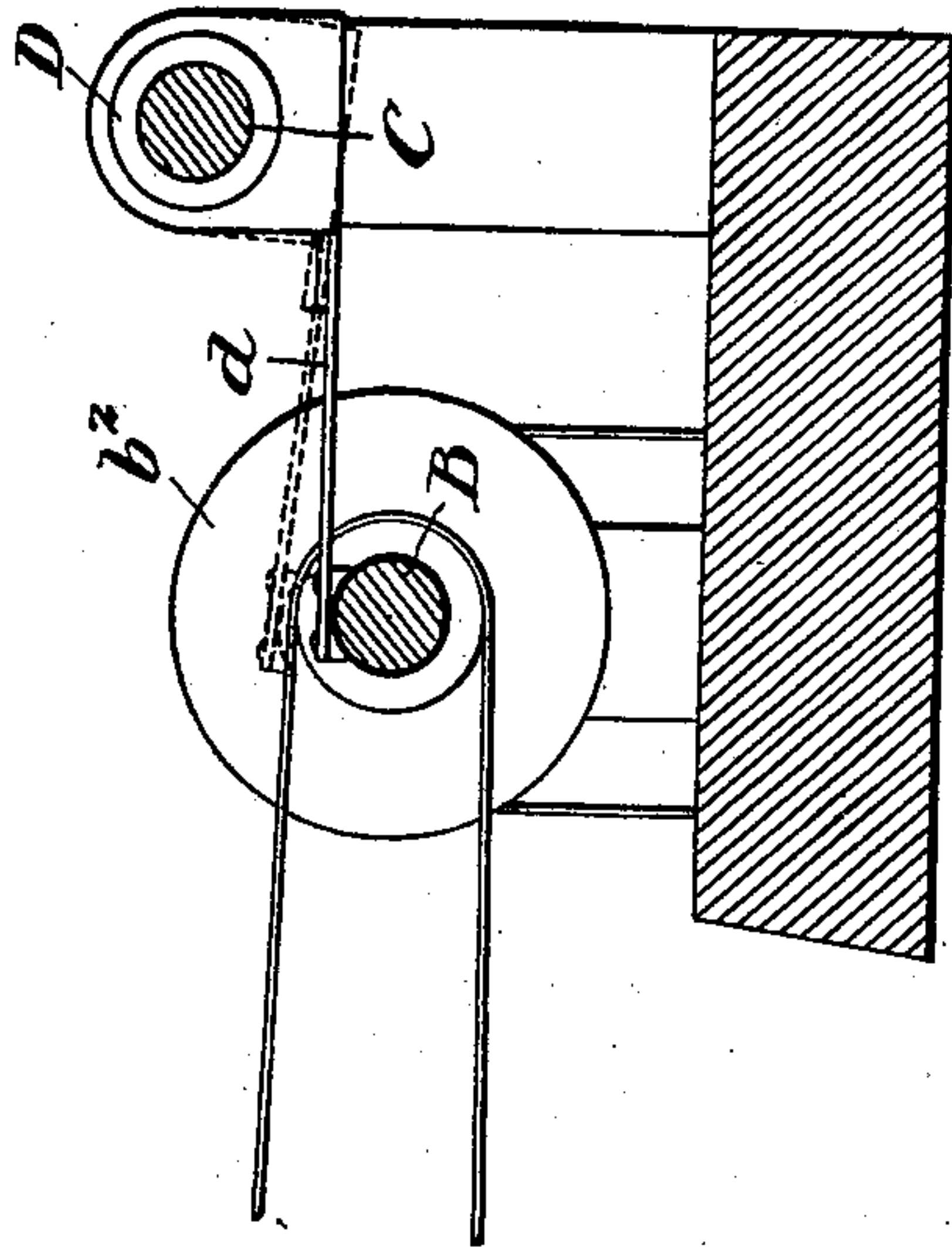
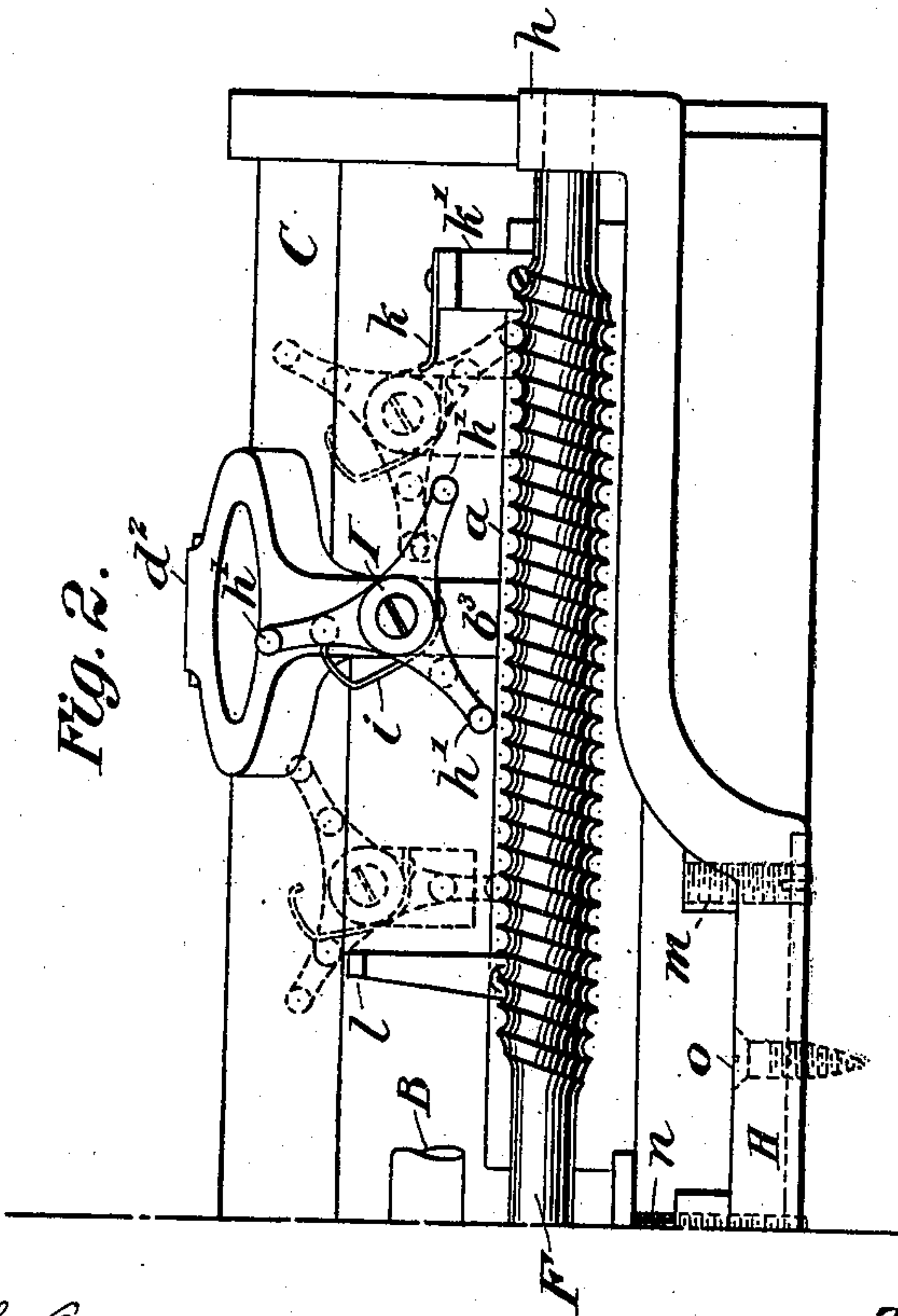


Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS L. DENNIS, JR., OF BROOKLYN, NEW YORK.

PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 590,643, dated September 28, 1897.

Application filed April 1, 1897. Serial No. 630,256. (No model.)

To all whom it may concern:

Be it known that I, THOMAS L. DENNIS, Jr., a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Phonographs, of which the following is a specification.

My invention, while relating to that class of machines or instruments known as "phonographs," has reference more particularly to the means made use of for causing the traveling diaphragm to return to its initial position with respect to the record-cylinder after having completed its course along the length of that cylinder, and has for its object to provide an automatically-operating switchback mechanism which at the completion of the forward travel of the diaphragm and its supporting carrier or arm shall disconnect the feeding mechanism and cause the diaphragm to rapidly resume its initial position and, if needful, to then automatically disconnect the backward-carrying devices and bring the feeding mechanism again into action.

To accomplish all of this and to secure other and further advantages in the matters of construction, operation, and use, my improvements involve certain novel and useful arrangements or combinations of parts, peculiarities of construction, and principles of operation, all as will be hereinafter more fully described, and then pointed out in the subjoined claims.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a plan or top view of an ordinary form of phonograph, showing my improvements applied in connection therewith, the diaphragm being represented at a point near the completion of its forward course; Fig. 2, a side elevation thereof with portions at the left of Fig. 1 omitted and illustrating in dotted lines different positions assumed by the tripping mechanism; Fig. 3, an end view, partly in section and partly in elevation, showing the feeding-nut in and out of engagement with the feeding-screw and indicating the course of the belt or other connection by which the retracting-screw may be driven; and Figs. 4 and 5, side and end views, respectively, of the extremity of the diaphragm carrier or arm, the latter figure representing the spring applied

thereon and both figures omitting the revolving tripper shown in Figs. 1 and 2.

In all the figures like letters of reference are employed to designate corresponding parts.

A indicates the record-cylinder, and B the shaft through which it is rotated at the required times. This shaft is mounted on suitable centers $b b$ or in other appropriate bearings secured to or forming parts of the bed of the machine and is provided with the usual feed-thread b' , extending throughout a portion of its length, and with a pulley b^2 at one of its ends, through which its rotation is effected from the motor or other source of power by a belt or other equivalent form of motion-transmitting devices.

Arranged in parallelism with the shaft B is a guide-rod C, upon which is fitted to slide a sleeve D. This sleeve is provided at one of its ends with the segmental nut d , that engages at the appropriate times with the feed-thread b' , and at its other with the carrier or arm d^2 , which, extending over the record-cylinder A, carries, in a suitable frame formed therein, the diaphragm E and is normally supported at its free end from the slide a on the base of the machine, when the diaphragm is being fed over the record-cylinder, by a lug or strut b^3 , depending from its under side, as shown. As thus arranged when the segmental nut d is brought into engagement with the feed-thread b' and the shaft B is rotated in the proper direction the record-cylinder will be similarly rotated and the diaphragm, with its carrier or arm, fed forward along the same, bringing the projecting stylus on its under side into engagement with the surface thereof, and thereby permitting of either the formation of appropriate indentations in such surface by the applications of the requisite vibrations to the diaphragm or of the reproduction of the tones or speech corresponding to such indentation if previously formed, as may be desired.

The several parts as thus far described, while coöperating to produce the results specified, possess no novelty in themselves, but are or may be the same as those heretofore in use and require no further description herein.

My invention, on the other hand, as above indicated, relates to the means whereby the diaphragm is caused to return to its initial

position automatically after having been fed over and along the record-cylinder A, and to this end I make use of the screw-shaft F, which is journaled in suitable bearings h ,
 5 formed in the stand H in parallel relationship to the shaft B, from which latter the shaft F is rotated through the intermediaries of the belt c and the pulleys h^3 and f , with which such shafts are respectively provided. In my
 10 preferred form of construction I find it convenient to make the screw-thread of this shaft F run in a different direction from that of the shaft B—as, for instance, make it a left-hand thread if the thread b' is a right-hand one—
 15 and to rotate the two shafts in the same direction, but this is unessential, and both of the threads may be of the same hand, in which event the two shafts will be rotated in opposite directions; but however the threads of
 20 these two shafts may be disposed with respect to one another I find it desirable to make the pitch of the thread of the screw-shaft F considerably greater than that of the thread of the shaft B, whereby to insure of a
 25 greater speed of travel of the diaphragm when moving back to its initial position under the operation of the former thread.

Coöperating with the screw-shaft F is a tri-armed tripper I, the arms of which are similar and preferably disposed at equal distances
 30 apart around its axis. This tripper is pivoted to the free end of the carrier or arm d^2 , which is extended sufficiently beyond the supporting lug or strut b^3 to bring the former approximately over the axis of the shaft F and
 35 is provided at its extreme end with an up-turned ear b^4 for reception of the screw b^5 , upon which such tripper is pivoted.

In the construction of the tripper the arms
 40 are made of such length that when either is forced into a vertical position and is in engagement with the thread of the screw-shaft F it will elevate the free end of the carrier or arm d^2 with the diaphragm and other attach-
 45 ments to such an extent as to make them clear the record-cylinder during their retracting movement and at the same time disengage the segmental nut d from engagement with the feed-thread b' of the shaft B, as indicated
 50 in dotted lines in Fig. 3. As thus constructed and arranged the plane of rotation of the tripper is approximately coincident with a plane passing longitudinally through the axis of the shaft F, and in order to insure the
 55 proper engagement of its arms with the thread of such shaft I find it convenient to equip each of their extremities with a short transversely-arranged cylindrical portion h' , which is provided with a circular notch h^2 in its side,
 60 whereby to straddle and receive the upper portion of the thread of the screw-shaft F, as shown in Fig. 1.

In addition to the transversely-arranged cylindrical portion h' each of the arms of this
 65 tripper is likewise provided with a pin h^4 , projecting outwardly from its rear side for coöperation with the holding-spring i , which is se-

cured to the under side of the free end of the carrier or arm d^2 , in close relationship to the plane of rotation of the inner face of the tripper, by a screw i' . As thus disposed each of the pins h^4 will be brought into engagement with the spring i in succession as the tripper is rotated upon its pivot and the movement of the same arrested until the spring is bent inward away from the path of travel of said pins, when such rotation will be resumed, and so on.

With the tripper I and spring i are employed stops k and l , the former of which is made in the form of a plate-spring and is supported from some convenient part of the machine, as from the base-plate thereof, in line with the travel of the tripper, by a stand k' , while the latter is preferably made from a rigid bar in L shape and so secured to the base-plate of the machine as to bring the extremity of its free end into and slightly across the line of travel of the spring i .

The several parts being constructed and arranged, as above explained, with the tripper I in the position shown in full lines in Fig. 2, the operation of the machine will be as follows: On rotating the shaft B in the proper direction the record-cylinder will be similarly rotated and the diaphragm carried over and along the same until the upper surface of the arm of the tripper I that is in advance is brought into contact with the under side of the spring-stop k and the tripper so rotated thereby as to force the extremity of that arm down into engagement with the thread of the screw-shaft F, or into the positions shown by dotted lines at the right of Fig. 2. The arm of the tripper having been thus brought into engagement with the thread of this screw will be carried along with it as such shaft is rotated and the tripper rotated upon its axis until such arm is carried into a vertical position, or into the position shown by dotted lines at the left of Fig. 2, the result of which will be to raise the free end of the carrier or arm d^2 with the diaphragm and thereby disengage the segmental nut d from the thread b' of the shaft B and stop the further feeding of the diaphragm along the record-cylinder. The arm of the tripper engaged with the screw-shaft F having been carried thereby into a vertical position, the pin h^4 of the next preceding arm of the tripper in the direction of its rotation will be brought into contact with the spring i , the resistance of which is sufficient to prevent the further turning of the tripper. As a consequence of this the elevated diaphragm, with the tripper and the segmental nut, will be carried back until in its backward movement the spring i is brought into contact with the free end of the stop l , when the further backward movement of the parts will cause the said spring to move inward, releasing the pin h^4 from engagement therewith and allowing of the rotation of the tripper upon its axis, together with the disengagement of the arm of the tripper from

the thread of the screw-shaft F and the return of the diaphragm and the other parts to their normal positions, with the segmental nut into engagement with the thread *b'* of the shaft B ready for another forward movement, and so on.

In some instances I find it convenient to secure the stand H fixedly to the bed of the machine. I prefer, however, to provide for its vertical adjustment, whereby to insure of the proper engagement and disengagement of the segmental nut with the thread *b'* of the shaft B by the operation of the tripper I, and for this purpose I make use of the adjusting-screws *m* and *n*, the former of which I preferably insert into threaded orifices upward from the under side of the stand and the latter of which is provided with a milled head and is inserted downward from the upper side of such stand, as shown. When this arrangement of adjusting-screws is employed, I find it desirable to secure the stand H to the base of the machine by a screw *o*, passing down through the center of the former and engaging with its free end the base below.

From the foregoing it will be seen that the improvements are simple in construction, efficient in operation, and well calculated to answer all the purposes or objects of the invention hereinbefore alluded to.

Although in the foregoing I have described the best means contemplated by me for carrying my invention into practice, I wish it distinctly understood that I do not limit myself strictly thereto, but reserve to myself the right to modify the same in various ways without departing from the spirit thereof.

Having now fully described my invention and specified certain of the ways in which it is or may be carried into effect, I claim as new and desire to secure by Letters Patent—

1. In a phonograph, a rotatable tripper combined with the diaphragm-carrier, and a stationary stop, with which such tripper engages and is rotated to effect the elevation of the carrier at the completion of its forward travel, substantially as and for the purposes set forth.

2. In combination, with the diaphragm-carrier having a rotatable tripper, a screw-

shaft for returning the carrier, and means substantially as described for compelling the tripper to rotate and engage with the shaft at the time, and substantially in the manner, set forth.

3. The diaphragm-carrier, a revolving tripper mounted thereon, a stationary stop having a spring for turning the tripper, and a threaded shaft for engaging an arm of said tripper and moving the same, the parts being combined substantially as shown and described.

4. In combination, with the revolving tripper mounted on an arm of the diaphragm-carrier, a resistance-spring also mounted on said arm and arranged to bear against a pin or projection on the tripper to limit its movement, substantially in the manner and for the purposes set forth.

5. The revolving tripper having the pins or projections, a resistance-spring for bearing against either of the pins, and a stop against which the spring is borne to release the pin, combined and arranged for operation substantially as described and for the purposes set forth.

6. In a phonograph, a feeding-screw, feeding-nut, diaphragm-carrier, an automatically-operating switching and tripping mechanism applied on said carrier, and revolving threaded shaft for engaging the tripper and retracting the diaphragm-carrier, combined and arranged substantially as set forth.

7. In a phonograph, the combination with the diaphragm-carrier, an automatic tripping and switching device applied thereon, and the revolving shaft for carrying the tripper backward, of means substantially as described for automatically disengaging the tripper from the said shaft, thereby lowering the diaphragm-carrier and bringing the feeding mechanism into action, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my hand this 27th day of March, 1897.

THOMAS L. DENNIS, JR.

Witnesses:

FRANK S. OBER,
R. F. SWEENEY.