

No. 766,115.

PATENTED JULY 26, 1904.

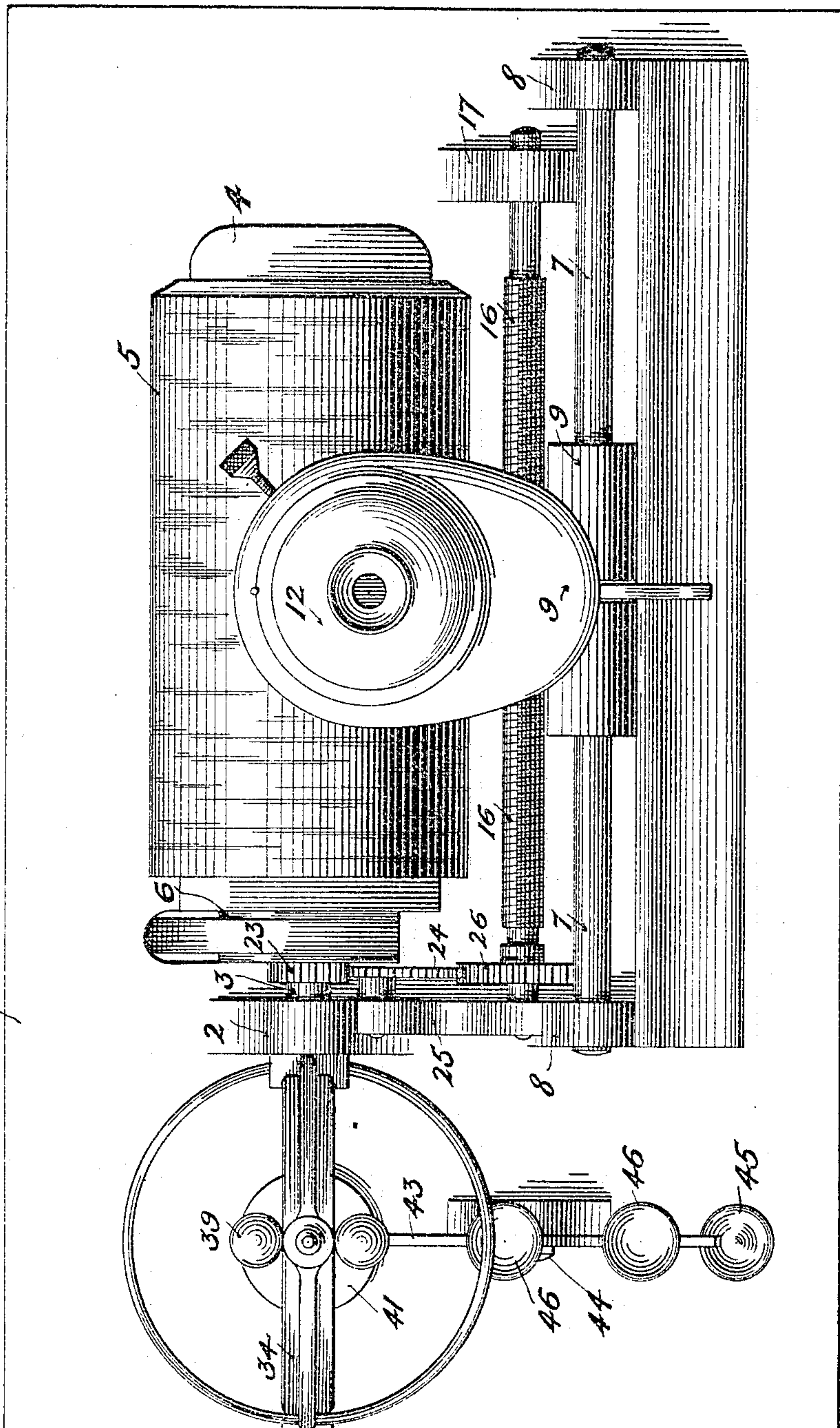
A. N. PETIT.
PHONOGRAPH.

APPLICATION FILED DEC. 19, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

FIG. 1.



Witnesses

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4 SHEETS—SHEET 2.

FIG. 2.

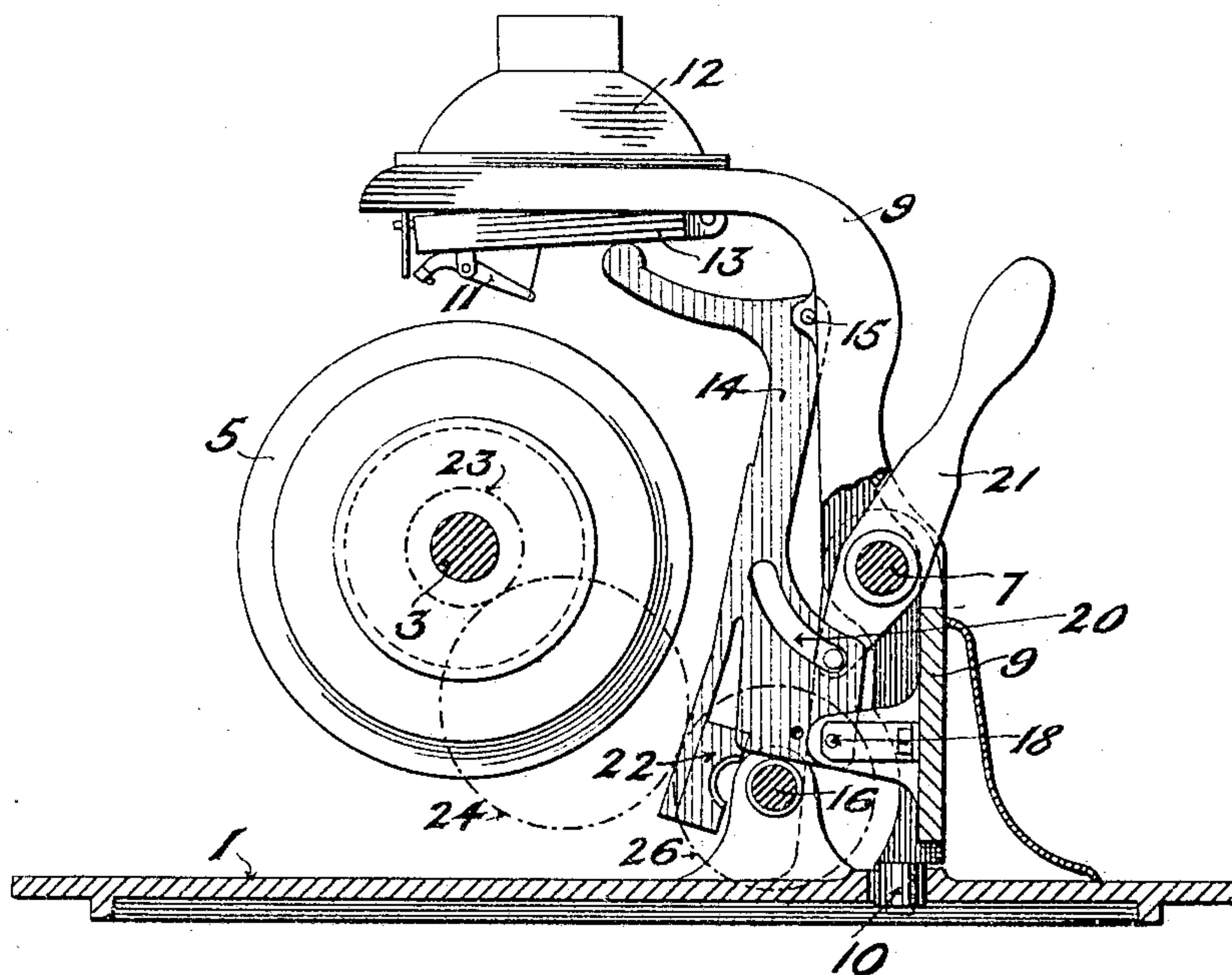


FIG. 3.

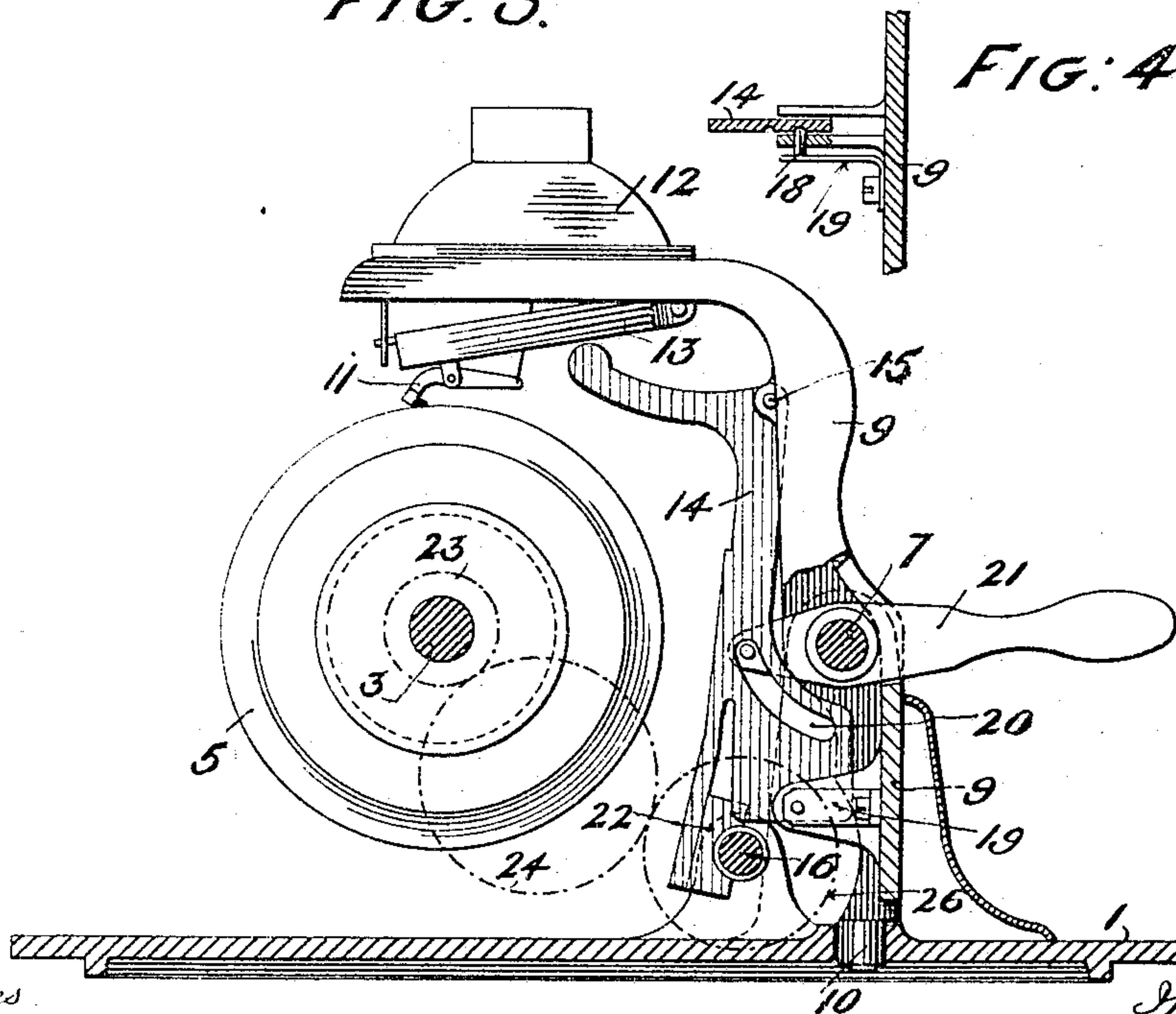
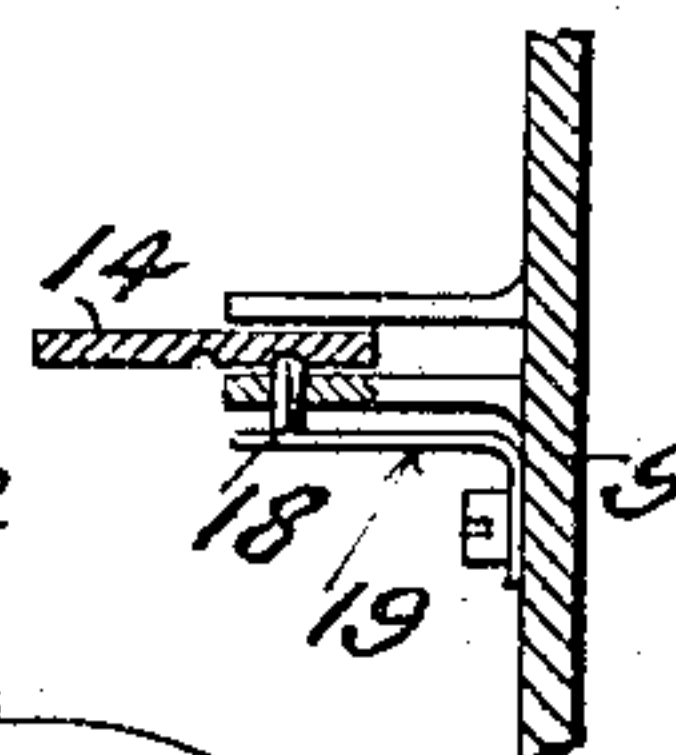


FIG. 4.



Witnesses

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4 SHEETS—SHEET 3.

FIG: 5.

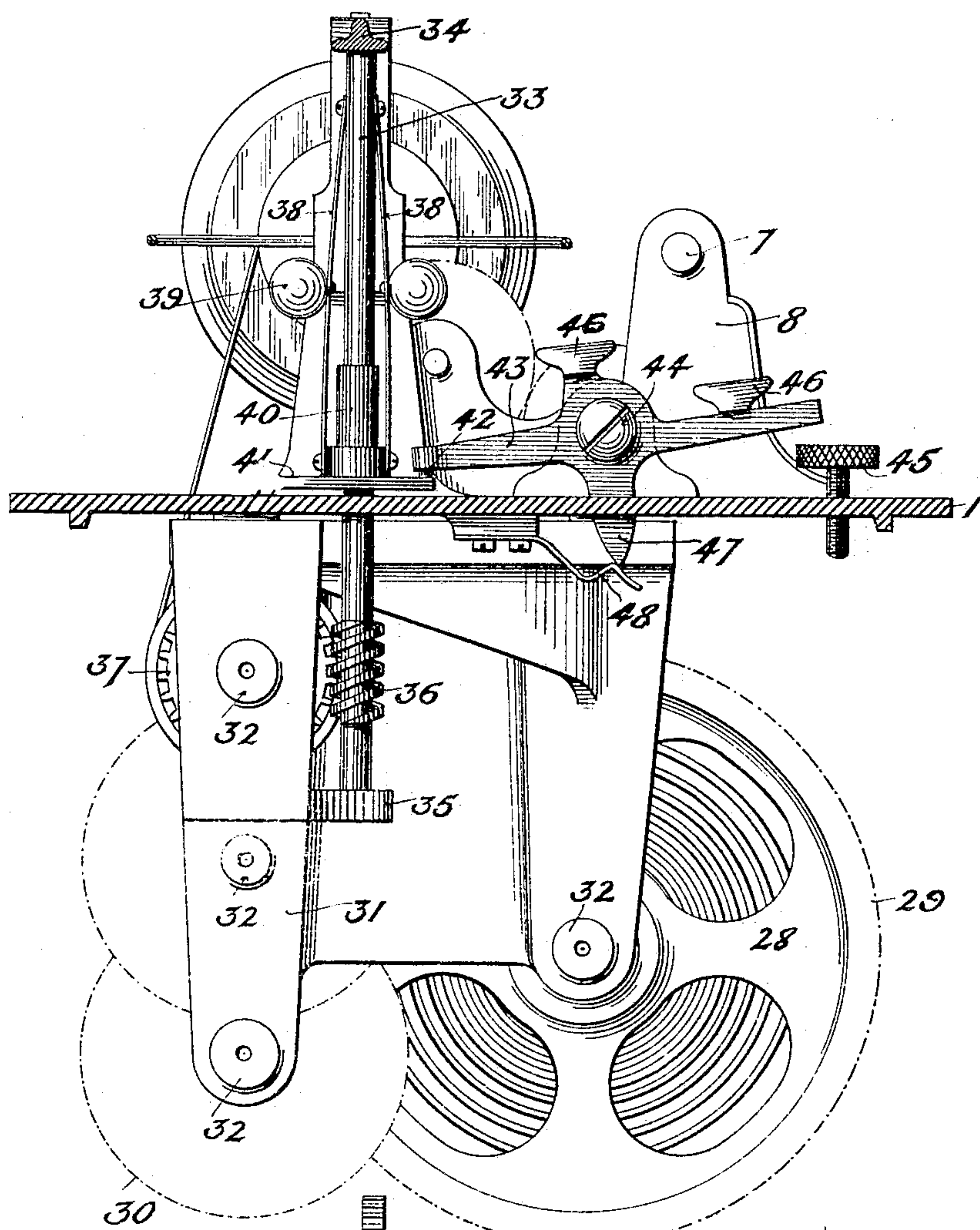


FIG. 7.

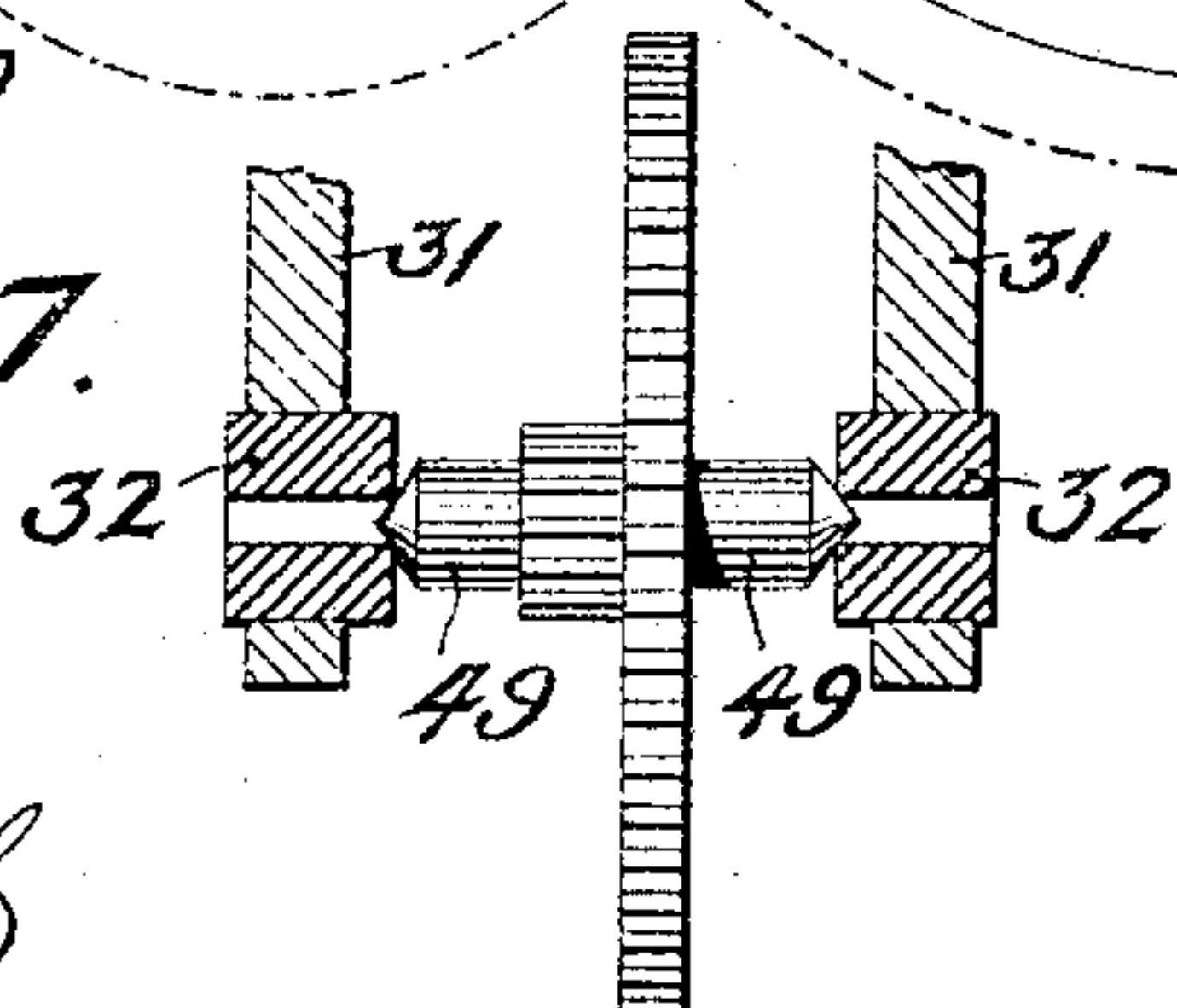
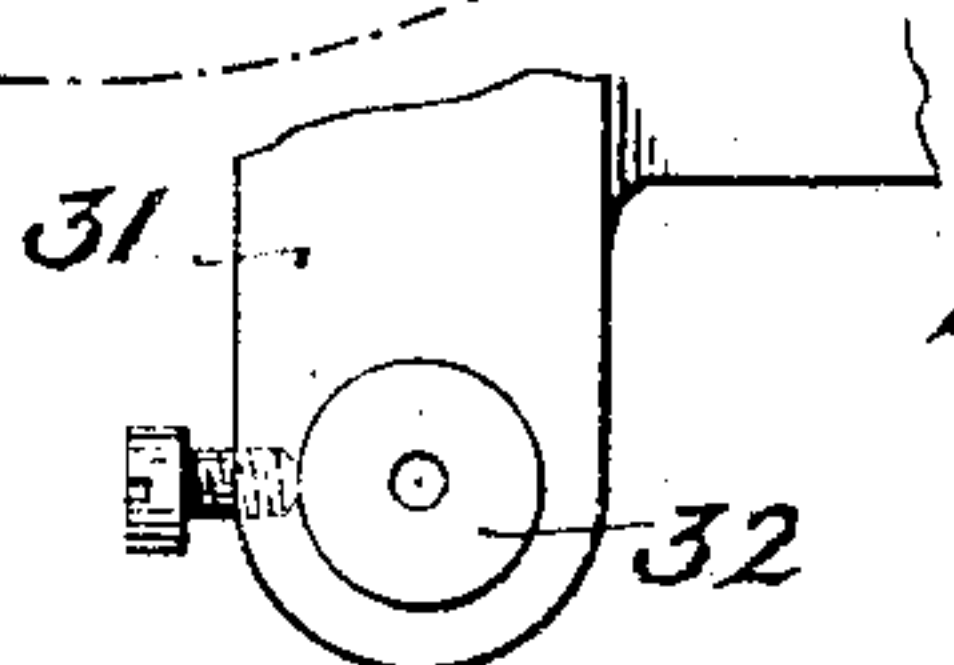


FIG. 8.



Witnesses

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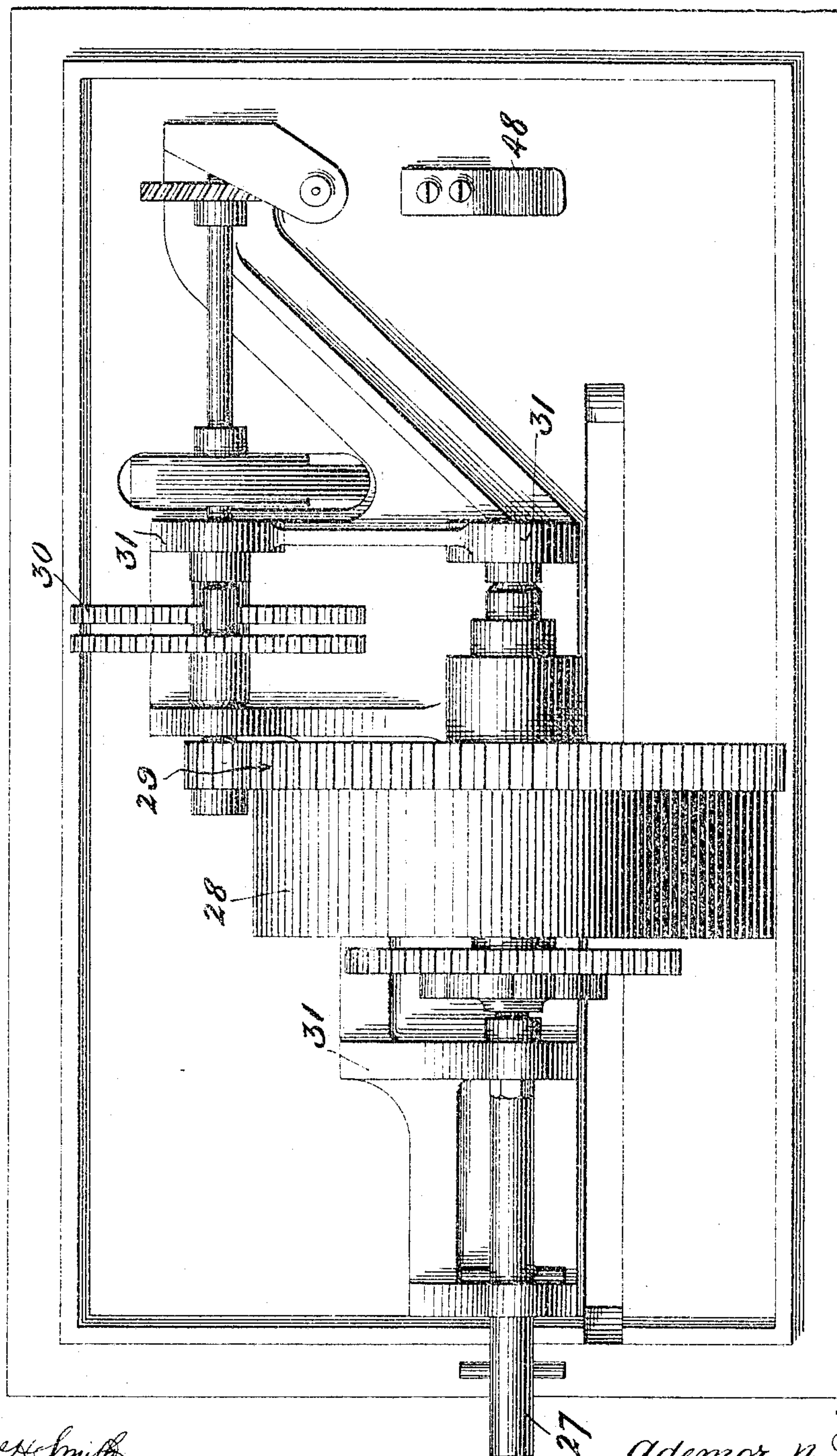
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APPLICATION FILED DEC. 19, 1903.

NO MODEL.

4 SHEETS-SHEET 4

FIG. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

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PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 766,115, dated July 26, 1904.

Application filed December 19, 1903. Serial No. 185,786. (No model.)

To all whom it may concern:

Be it known that I, ADEMOR NAPOLEON PETIT, a citizen of the United States of America, residing at 1 South View, Waterloo, near
5 Liverpool, in the county of Lancaster, England, have invented a certain new and useful Improved Phonograph, of which the following is a specification.

This invention refers to an improved construction of phonograph in which the traversing carriage is carried upon a longitudinally-fixed rod, while it is guided by that rod and also by a portion of the carriage entering a slot in the bed-plate, these means for carrying and guiding the carriage being effective,
15 and by reason of the two bearings at a distance apart the movement of the carriage is rendered easy and not subject to irregular motion. The carriage is further fitted with
20 an improved adjustment device for the stylus by which the latter can be placed into and out of operation with great ease and accuracy and without any special practice or skill or any liability of damage being caused to the
25 diaphragm, while the mechanism operates in such a manner that the carriage is brought into engagement with the lead-screw simultaneously with the bringing of the floating stylus-lever into operation. The lead-screw
30 is provided with a screw-thread of coarser pitch than that of the record, which is advantageous in view of the ease of manufacture of the screw. While it enables this to be done, the invention comprises a gearing between the screw and the mandrel of the machine for reducing the speed of the screw-shaft to counteract the difference in pitch between the thread of the latter and the thread of the record-cylinder.

The improved phonograph further presents a better arrangement of the speed-regulating gear than has heretofore obtained, a lever being provided and means for regulating the position of that lever so that the speed can
45 be controlled by a simple adjustment, and, further, the motor driving mechanism is constructed in such a manner that a wheel or other part which may be required to be repaired or renewed can be very readily re-

moved from the framework of the motor
without separating that framework, and thereby enabling parts which require to be renewed or repaired to be taken away from the framework by persons having but small amount of technical knowledge in such matters. 55

The invention consists in the construction and combinations of parts hereinafter described and claimed.

The improved phonograph is illustrated in the accompanying drawings. 60

Figure 1 is a plan view of the machine, Fig. 2 being an irregular transverse sectional end view to illustrate the carriage and the mechanism for connecting the latter with the lead-screw and for bringing the stylus-lever
65 into operation, this view showing the carriage thrown out of gear. Fig. 3 is a similar view to that shown at Fig. 2, but illustrating the same parts when in gear. Fig. 4 is a detail view showing in horizontal section the means
70 by which the positions of a lever, hereinafter described, which is carried by the carriage are defined. Fig. 5 is a sectional end view of the machine to illustrate the devices for controlling the speed of the machine and to show
75 also the general arrangement of the clockwork-motor which is arranged beneath the machine. Fig. 6 is an inverted plan view showing the said clockwork-motor beneath the bed-plate. Fig. 7 is a sectional front view, 80
and Fig. 8 a side view, showing detail construction of the devices hereinafter described for permitting of the removal of the arbors from the clockwork mechanism without removing the supporting-brackets or disturbing
85 that mechanism the removal of which is not called for.

Upstanding from the bed-plate 1 of the machine, Fig. 1, is a bracket in which is provided a bearing to support a cantaliver-shaft
90 3, upon which is fixed the usual taper mandrel 4, which receives the record-cylinder 5. The mandrel-shaft 3 is fitted with a pulley 6, driven by a belt from a suitable motor located beneath the bed-plate 1. 95

Parallel with the axis of the mandrel-shaft 3 I provide a fixed rod 7, supported by upstanding brackets 8 from the bed-plate 1, and

the rod 7 supports the carriage 9 by passing through its body, while it also forms one of the guides of the said carriage in its traverse. The second guide of the said carriage is formed

5 by a longitudinal slot made in the bed-plate 1, as will be seen at Figs. 2 and 3, and a projecting part or roller 10 on the base of the carriage, 9 takes into that slot, and so completes the guiding means for the carriage.

10 The carriage 9 is formed of an inverted-L-shaped casting, the upper horizontal arm being formed with a circular perforation to receive the vibrating diaphragm and the floating lever 11 with receiving-dome 12, from

15 which the trumpet is carried, the aforesaid arm of the carriage being so arranged, as shown, that the vibrating disk is held approximately vertically over the record in a horizontal position, while the downward arm extends to the base-plate, where it carries the

20 roller 10, and this downward arm is somewhat channel-shaped in its lower part to receive the mechanism for controlling the position of the stylus. The stylus-lever is carried on the usual weighted hinge-plate 13,

25 which when free keeps the stylus up to its work on the surface of the record 5 and enables it to follow the irregularities of the cylinder, as well as the undulations of the record-grooves.

30 On the inner side of the carriage 9 I provide a bell-crank lever 14, which is pivoted to the carriage 9 at 15, one of its arms terminating beneath the weighted hinge-plate 13, while about the extremity of the other arm a

35 portion of a screw-nut is fixed or formed which is adapted to engage with the lead-screw 16 when the said lever 14 is in such a position that the stylus is in contact with the record-

40 cylinder. The lead-screw is of course arranged parallel to the axis of the mandrel 4 and of the guide-rod 7 and is carried in the bearings 17, rising from the surface of the bed-plate. It will thus be seen that the rock-

45 ing of the lever 14 not only causes the screw-nut to be brought into mesh with the surface of the screw, but that at the same time and by the same movement the weighted hinge-plate 13 is allowed to descend and to bring

50 the stylus into contact with the record-surface.

The lever 14 must be caused to assume either of two positions—namely, that at Fig. 2 or that at Fig. 3—and in order to define those

55 two positions two indents are formed in the surface of the lower end of the lever, one or other of which is entered by a pointed pin 18, Fig. 4, which is carried by a spring 19 on the framework of the carriage, and in order

60 to actuate the lever 14 it is formed with a curved slot 20, Figs. 2 and 3, the slot being entered by a pin carried upon a lever 21, fulcrumed upon the guide-rod 7 and adapted to be rocked thereon by hand, so that when in

65 an upper position, as at Fig. 2, the machine

is thrown out of operation, and at the lower position, as at Fig. 3, the upper arm of the lever 14 is drawn away from the weighted hinge-plate 13, while the nut 22 is simultaneously brought into engagement with the lead-

70 screw 16. The thread-pitch of the lead-screw 16 being twice as great as the thread on the record-cylinder, the speed of rotation of the said lead-screw is reduced relatively to that

75 of the mandrel by means of toothed gearing, there being a toothed wheel 23 on the mandrel-shaft, driving an intermediate toothed wheel 24, mounted on a stud-axle supported by a bracket 25 on the base-plate, the latter

80 wheel driving a toothed wheel 26 on the lead-screw, as is shown at Fig. 1 and by dotted lines at Figs. 2 and 3.

The motor, located beneath the bed-plate 1, (see Figs. 5 and 6) is of the "spring-motor" type, which can be wound by a key-shaft 27,

85 as with ordinary clock mechanism, and the various wheels and working parts—such as the spring-drum 28, the gearing 29 30—being carried by inverted brackets 31, fixed to the said bed-plate.

90 In such motors, as before stated, it is advantageous to permit of the removal of any single arbor, together with the wheel or wheels which that arbor carries, without disturbing or taking to pieces the framework 31, which

95 carries the arbors, and without disturbing any of the other arbors or wheels which it is not required to remove at the time. In order to permit of this being done and referring to Figs. 7 and 8, each arbor is made of less length

100 than the distance between the two brackets by which it is supported. Thus in the instance illustrated in the latter figures the arbor 49 is less in length than the distance between the two brackets 31 31, and the ends of

105 the arbor 49 are carried in bushes 32, (see also Fig. 5,) which bushes are capable of being slid longitudinally in the brackets composing the framework of the motor, so that on sliding two of such bushes 32 apart the arbor is

110 left entirely free and can be removed from the bracket without giving the arbor any endwise motion and without disturbing the remainder of the mechanism.

The bushes 32 are made of such length as

115 to slide onto the ends of the arbors, and thus form the bearings, and they are retained in position, as shown at Fig. 7, by any suitable means—such, for instance, as by set-screws, one of which is shown at Fig. 8. This mode

120 of removal of the arbors which carry the wheels is very important—that is, being able to withdraw the arbor without giving it any endwise motion whatever—because where such an arbor carries several wheels if it had to be given

125 any endwise motion it would sometimes be necessary to remove an adjacent arbor, for instance, which carried engaging wheels, and so defeat the object which has been had in view in this construction—namely, that of remov-

130

ing an arbor without giving it endwise motion and without disturbing adjacent parts or the framework by which it is carried.

The governor of the motor is arranged above the bed-plate 1 of the machine and may be of usual type, consisting of a shaft 33, the upper end being carried in an arched bearing-bracket 34, while the lower end passes through the bed-plate, is supported on a bracket 35, and is formed with a screw-thread 36, gearing with a worm-wheel 37 on the driven shaft of the motor, by which the governor-shaft 33 is revolved. To the upper end of the shaft 33 is fixed the ends of two springs 38, carrying governor-balls 39, the lower ends of the springs being attached to a sleeve 40, free to rise and fall, as the balls vary in their distance from the axis of the governor-shaft according to the speed of rotation. The sleeve 40 has a flanged disk 41 fixed or formed with it, and this disk is acted upon frictionally by the bearing-point 42 of the bracket-lever 43. The bracket-lever 43 is fulcrumed at 44 on a bracket from the base-plate 1, and that end of the lever beyond the fulcrum and opposite to the bearing-point or friction-pad 42 extends over a distance-screw 45 in the bed-plate, by which the amount the outer end of the lever 43 can be depressed is regulated.

46 represents two finger-keys by which the lever 43 may be rocked, and the latter is formed with a downwardly-extending arm 47, against which a spring 48, beneath the bed-plate, acts, and the spring is so bent as to cause the lever 43 to either press against the friction-plate 41 of the governor or against the head of the distance-screw, according as to which way the lever is rocked. By depressing the outer end of the lever, and so causing it to be brought against the distance-screw 45 and held there by the spring 48, the friction-pad 42 is removed from the friction-disk 41, and the latter is free to rotate. As it rotates the governing-ways 39 separate from the center and lift the friction-disk 41 until its surface is again in contact with the friction-pad 42 on the end of the lever. The friction between the friction-disk and friction-pad varies according to the amount the pad is depressed, so that by altering the angle of the lever by means of the regulating-screw 45 the speed of the motor can be varied at will.

To set the machine in operation, supposing the carriage parts to be in the position as at Fig. 2 and the governing-lever 43 in the position as at Fig. 5, the lever 43 is rocked on its fulcrum 44 until its outer end is in contact with the distance-screw 45, which will allow the motor to commence working, so revolving the mandrel-shaft and through the wheels 23, 24, and 26 the lead-screw 16. At the same time the lever 21 should be turned from the position shown at Fig. 2 to the position shown at Fig. 3, causing the lever 14 to be rocked from one position to the other and the regu-

lating-point 18, Fig. 4, to pass from one indentation to the other, and thereby accurately define the position of the lever 14. The machine being thus in operation, the speed can be regulated with the greatest nicety by adjusting the distance-screw 45. Upon the stylus having reached the end of the record the machine is instantly stopped by pressure of the finger upon that finger-key 46 which is on the record side of the lever 43, causing that lever to be rocked into the position shown at Fig. 5, and so allowing the bend of the spring 48 to press the friction-pad 42 of the lever against the friction-disk 41 of the governor, which it does with sufficient strength to stop the machine, and this stoppage, if desired, may be effected at any point of the working.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In phonographs the combination with a horizontal bed-plate, having a longitudinal guideway therein, a horizontal revoluble mandrel-shaft for carrying the record-cylinder, a bearing-bracket from the bed-plate to carry the said shaft by one of its ends, a motor located beneath the bed-plate, means for driving the mandrel-shaft from the motor, a horizontal screwed traversing shaft carried in bearings from the bed-plate, means for revolving the latter shaft from the mandrel-shaft, and mechanism for stopping or freeing the motor and for regulating its speed; of an inverted-L-shaped traversing carriage having an aperture in its upper horizontal arm extending above the mandrel for carrying the receiving-dome, vibrating diaphragm, weighted hinged plate, floating lever and stylus, brackets upstanding from the bed-plate, a fixed guide-rod supported by the said brackets and passing through the downward arm of the carriage to form one longitudinal guide for the latter, a projecting part on the downward arm of the carriage to enter the guideway in the bed-plate to form a second guide for the carriage, a bell-crank lever pivoted to the carriage, one arm terminating beneath the weighted hinged plate, and a screw-threaded half-nut at the extremity of the other arm of the lever to engage with the traversing screw, and means for rocking the bell-crank lever to simultaneously move the screw half-nut from engagement with the traversing screw and to raise the hinged plate and stylus-lever away from the record, or vice versa, substantially as set forth.

2. In phonographs, the combination with a horizontal bed-plate, a longitudinal guideway therein, a horizontal revoluble mandrel-shaft, a bearing-bracket from the bed-plate to carry the said shaft, a tapering mandrel carried by the mandrel-shaft to receive the sound-record cylinder, a motor located beneath the bed-plate, means for driving the mandrel-shaft from the motor, a horizontal screwed traversing shaft carried in bearings from the bed-

plate, means for revolving the latter shaft from the mandrel-shaft, and mechanism for stopping or freeing the motor and for regulating its speed; of an inverted-L-shaped traversing carriage having an aperture in its upper horizontal arm extending above the mandrel for carrying the receiving-dome, vibrating diaphragm, weighted hinged plate, floating lever and stylus, brackets upstanding from the bed-plate, a fixed guide-rod supported by the said brackets at each end and passing through the downward arm of the carriage to form one guide for the latter, a projecting part on the downward arm of the carriage to engage in the guideway in the bed-plate to form a second guide for the carriage, a bell-crank lever 14 pivoted to the carriage, one arm terminating beneath the weighted hinge-plate, and a screw-threaded half-nut at the extremity of the other arm of the lever to engage with the traversing screw, an operating-lever 21 pivoted on the carriage, a curved slot in the lever 14 and a pin on the lever 21 entering the said slot for rocking the lever 14 by the operation of the lever 21 to simultaneously lift the stylus-lever away from the record and the half-nut away from the screw-shaft, or vice versa, and a spring-pin carried by the carriage and bearing on the face of the lever 14, and two indentations in the said face of the latter lever into the one or the other of which the pin may enter to define the two positions of the said lever, substantially as set forth.

3. In phonographs, the combination with a horizontal bed-plate, a horizontal revoluble mandrel-shaft, a bearing-bracket from the bed-plate to carry the said shaft by one end thereof, a tapering mandrel carried by the mandrel-shaft to receive the sound-record cylinder, a horizontal screwed traversing shaft carried in bearings from the bed-plate, gearing for revolving the latter shaft from the mandrel-shaft, a traversing carriage, a receiving-dome, vibrating diaphragm, weighted hinged plate, floating lever and stylus carried by the traversing carriage, longitudinal guides for the said carriage, and mechanism for engaging or disengaging the carriage from the traversing screw and for engaging or disengaging the stylus-lever to or from the record-cylinder; of a motor located beneath the bed-plate, a pulley on the driven shaft of the motor, a belt from the said pulley passing over a pulley on the mandrel-shaft for revolving the latter, a vertical governor-shaft passing through the bed-plate, gearing connecting the vertical shaft with the driven shaft of the motor for revolving the governor-shaft, a sleeve on the governor-shaft above the bed-plate, and connections from the sleeve to the centrifugally-acting balls to lift the sleeve on the shaft as the speed increases, a disk on the sleeve, a three-arm lever pivoted on the bed-plate, a friction-stud 42 on one arm of the lever to act on the upper surface

of the sleeve friction-disk, an adjustable distance-screw in the bed-plate beneath the tail-arm of the lever 43 to regulate the distance to which the friction-stud 42 may be removed from the friction-disk, and a bent spring on the bed-plate to act against the third arm of the lever to cause the friction-stud 42 to be pressed on the friction-disk or to cause the tail-lever to be pressed upon the distance-screw 45, substantially as described.

4. In phonographs, the combination with a hinged bed-plate having a longitudinal guide-slot therein, a horizontal revoluble mandrel-shaft to receive the sound-record cylinder, a bearing-bracket from the bed-plate to carry the said shaft by one end thereof, a motor located beneath the bed-plate, means for driving the mandrel-shaft from the motor, a horizontal traversing shaft carried in bearings from the bed-plate, a screw-thread on the traversing shaft of greater pitch than the thread of the record-cylinder, toothed gearing connecting the traversing shaft with the mandrel-shaft and calculated to reduce the speed of the traversing shaft proportionally to the difference of pitch of thread between the traversing shaft and the record-cylinder, and mechanism for stopping or freeing the motor and for regulating its speed; of a traversing carriage, a receiving-dome, weighted hinged plate, floating lever and stylus, carried by the traversing carriage, a fixed horizontal guide-rod carried by brackets from the bed-plate and passing through the carriage to support the latter and to form one longitudinal guide therefor, a roller mounted on a vertical axis at the base of the traveling carriage and entering the guide-slot in the bed-plate to form a second guide for the carriage, and mechanism for engaging or disengaging the carriage from the traversing screw and for engaging or disengaging the stylus-lever to or from the record-cylinder, substantially as described.

5. In phonographs, the combination with a horizontal bed-plate having a longitudinal guide-slot therein, a revoluble horizontal cantaliver-shaft, a bearing-bracket upstanding from the bed-plate to support the cantaliver-shaft by one end thereof, a tapering mandrel carried by the cantaliver-shaft to receive the sound-record cylinder, a motor located beneath the bed-plate, a pulley on the driven shaft of the motor, a pulley on the mandrel-shaft, a driving-belt connecting the two pulleys for revolving the mandrel-shaft, means for governing the speed of the motor, a traversing screw-shaft parallel to the mandrel-shaft, and means for rotating the said screw-shaft; of an inverted-L-shaped traveling carriage, a receiving-dome, a vibrating diaphragm, weighted hinge-plate, floating lever and stylus carried by the horizontal arm of the carriage, and located vertically above the mandrel, a fixed guide-rod supported from the bed-plate parallel to the

screw-shaft and passing through the downward arm of the carriage to form one guide for the latter, a projecting part on the downward arm of the carriage to enter the guide-slot of the bed-plate, a bell-crank lever 14 pivoted to the carriage, one arm thereof terminating beneath the weighted hinged plate and a half screw-nut carried at the extremity of the other arm of the lever to engage with the traversing screw, and mechanism carried by the carriage for adjusting the position of the lever 14 to simultaneously move the half screw-nut from engagement with the traversing screw and to raise the hinged plate and stylus-lever away from the record, or vice versa, substantially as set forth.

6. In phonographs, the combination with a mandrel-shaft to carry the sound-record cylinder, a traversing carriage for carrying the recorder or reproducer, guides for the carriage, a traversing screw for the traversing carriage, gearing connecting the traversing

screw with the mandrel-shaft for operating the latter, and a bed-plate above which the aforesaid parts are supported and carried; of a spring-motor located beneath the bed-plate, a metal framework fixed beneath the bed-plate, pendent arms from the framework, arbors to carry the gearing each of the said arbors being of less length than the distance between the pendent arms between which it is carried, an aperture in the end of each of the arms, an adjustable bush located in each aperture to receive the ends of the arbors and to form bearings therefor, the said bushes being capable of endwise adjustment to permit of the arbors being removed and replaced in a direction parallel to their axes, and means for securing the bushes in position, substantially as set forth.

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Witnesses:

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