

No. 668,154.

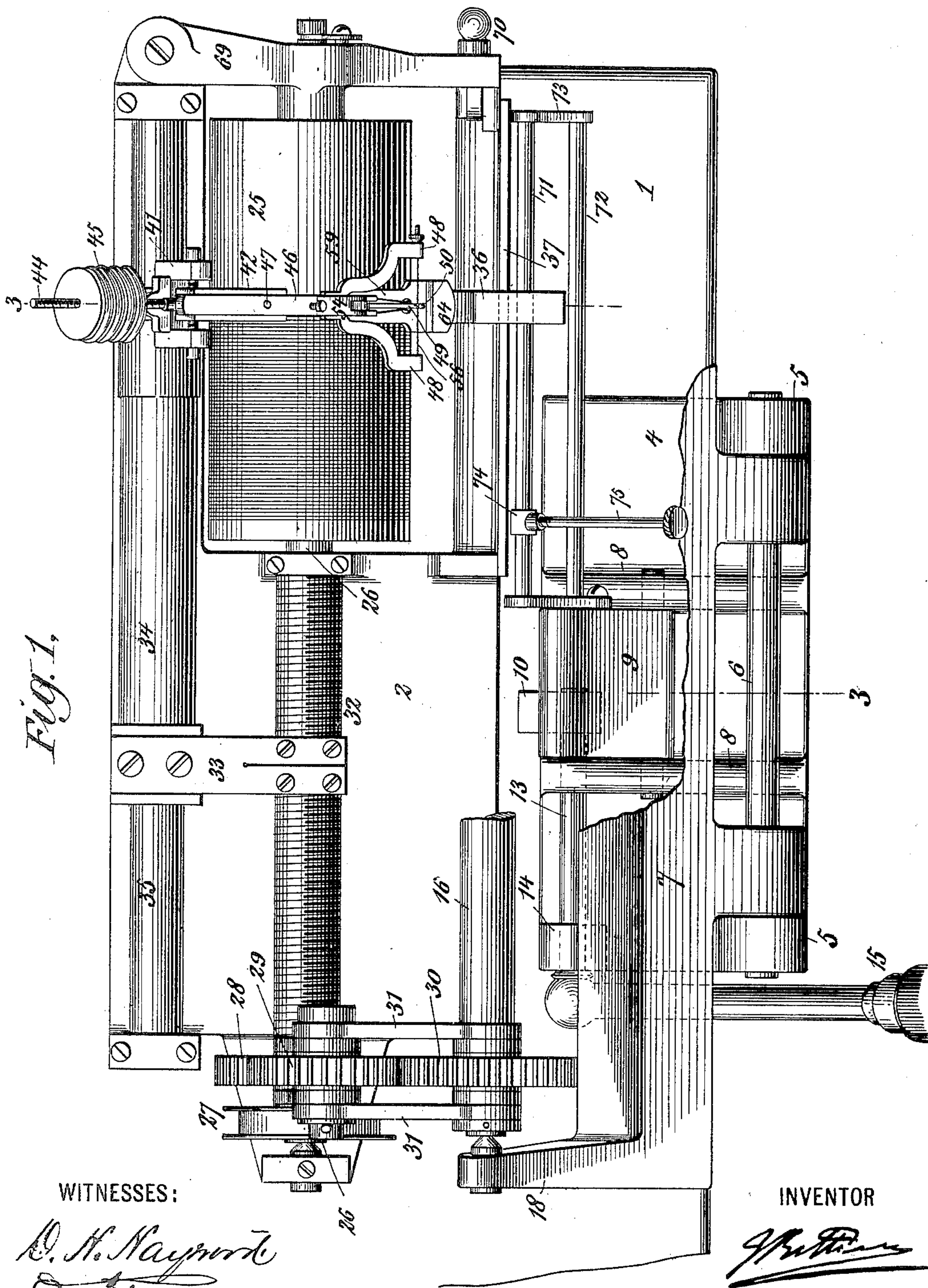
Patented Feb. 19, 1901.

G. BETTINI.  
PHONOGRAPH RECORD DUPLICATOR.

(No Model.)

(Application filed July 27, 1897.)

5 Sheets—Sheet 1.



No. 668,154.

Patented Feb. 19, 1901.

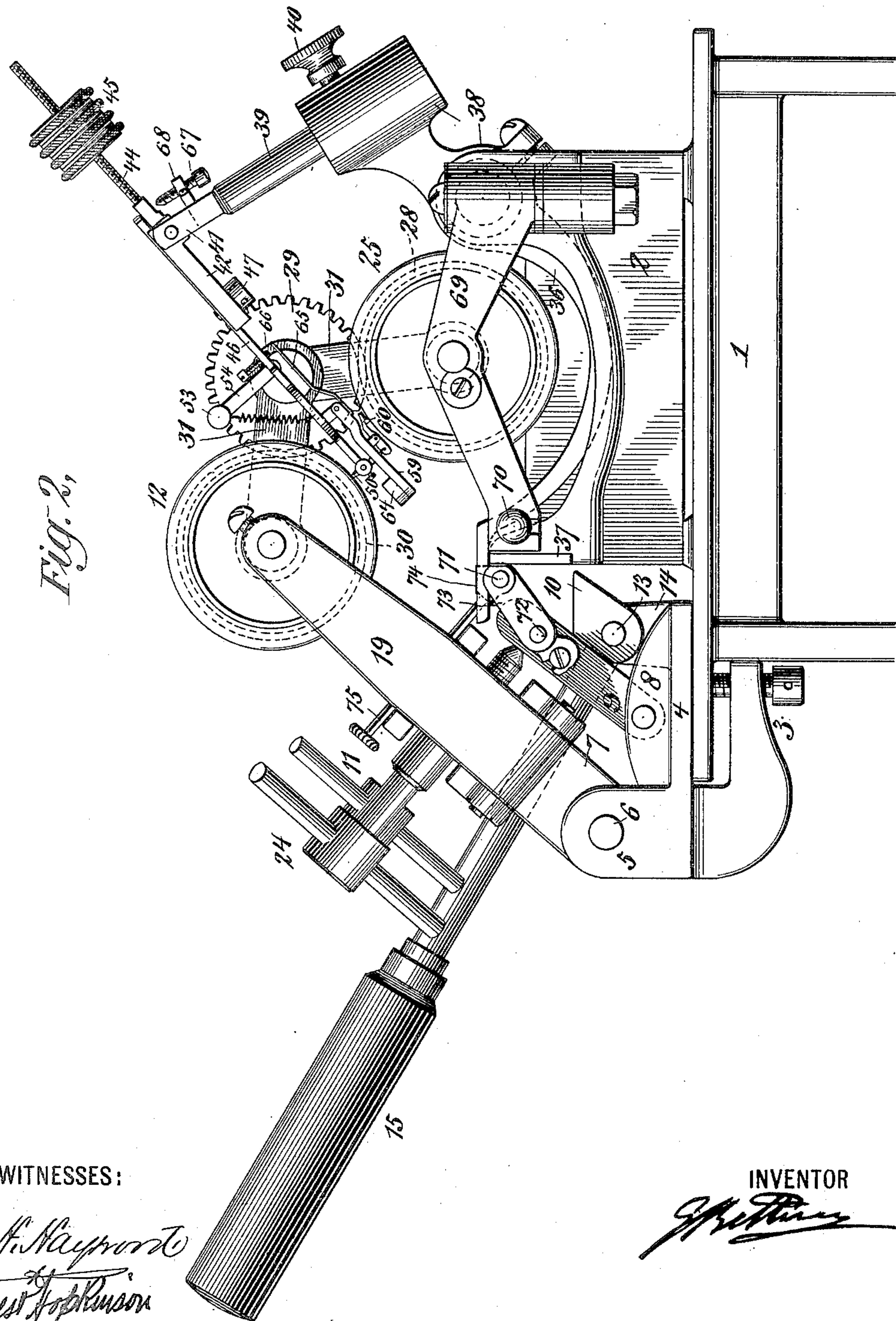
G. BETTINI.  
PHONOGRAPH RECORD DUPLICATOR.

(No Model.)

(Application filed July 27, 1897.)

5 Sheets—Sheet 2.

Fig. 2.



WITNESSES:

*N. H. Hayward*  
*Ernest J. Johnson*

INVENTOR

*G. Bettini*



No. 668,154.

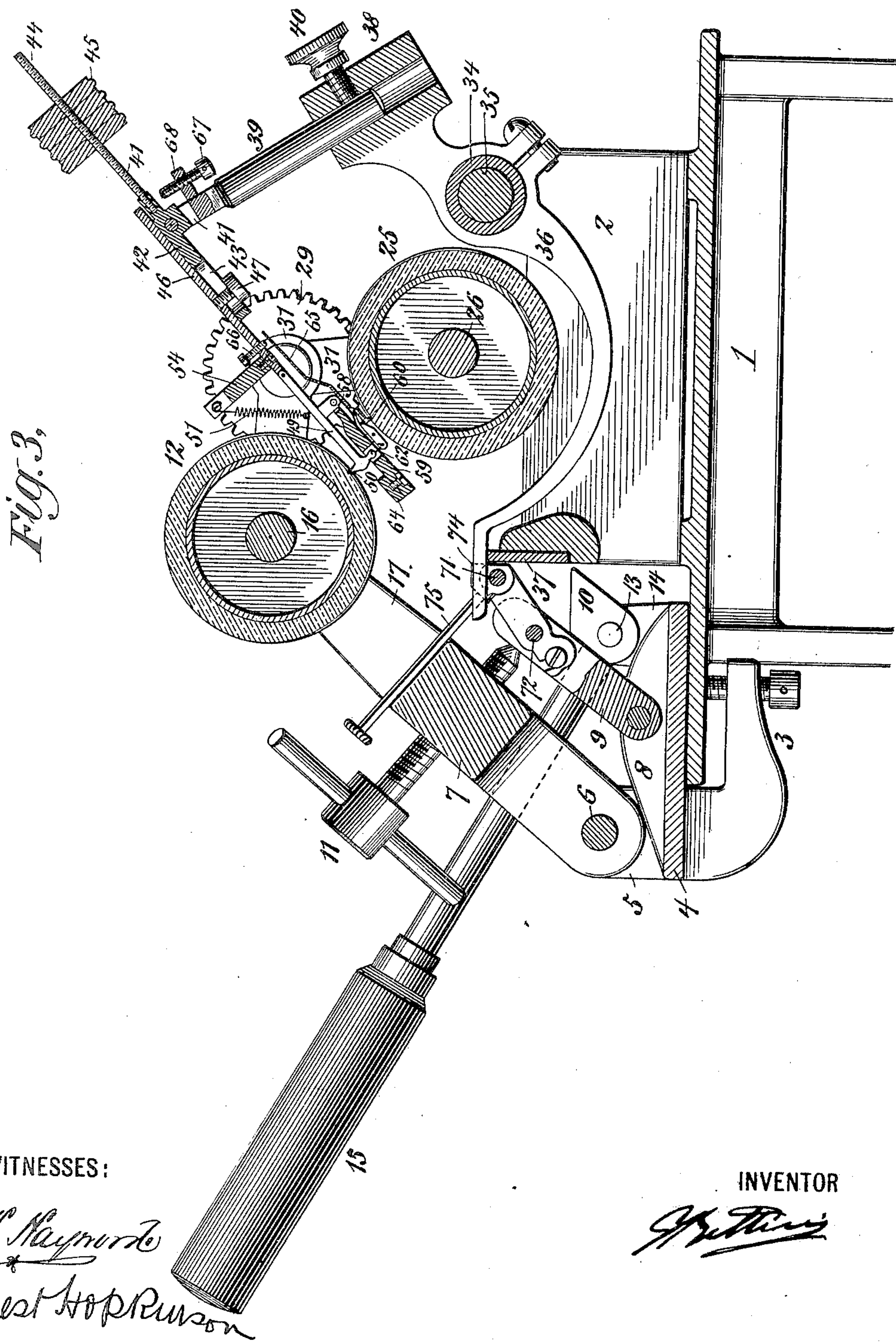
Patented Feb. 19, 1901.

G. BETTINI.  
PHONOGRAPH RECORD DUPLICATOR.

(No Model.)

(Application filed July 27, 1897.)

5 Sheets—Sheet 3.



No. 668,154.

Patented Feb. 19, 1901.

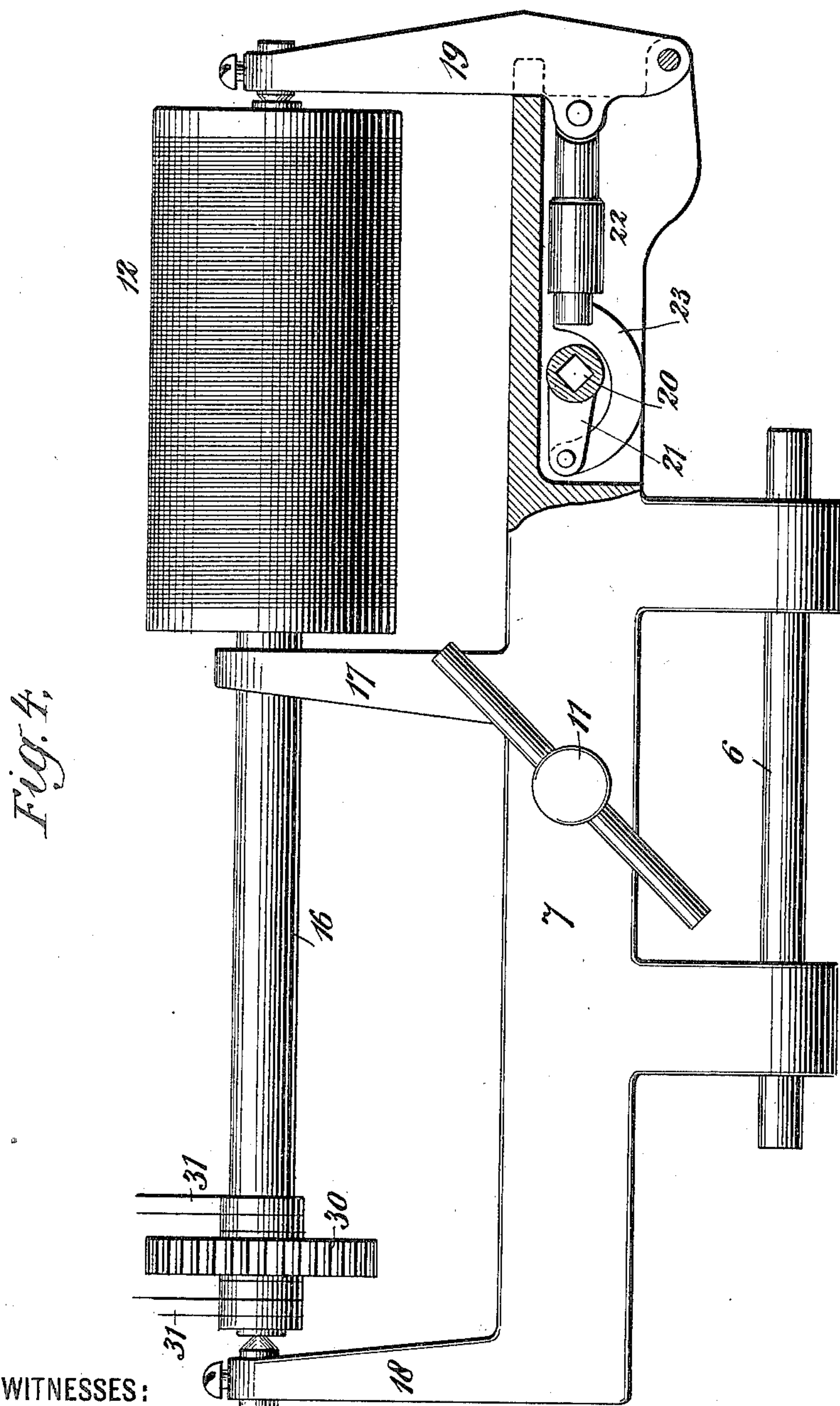
G. BETTINI.

PHONOGRAPH RECORD DUPLICATOR.

(No Model.)

(Application filed July 27, 1897.)

5 Sheets—Sheet 4.



WITNESSES:

*R. H. Hayworth*  
*Ernest Hopkinson*

INVENTOR

*G. Bettini*



No. 668,154.

Patented Feb. 19, 1901.

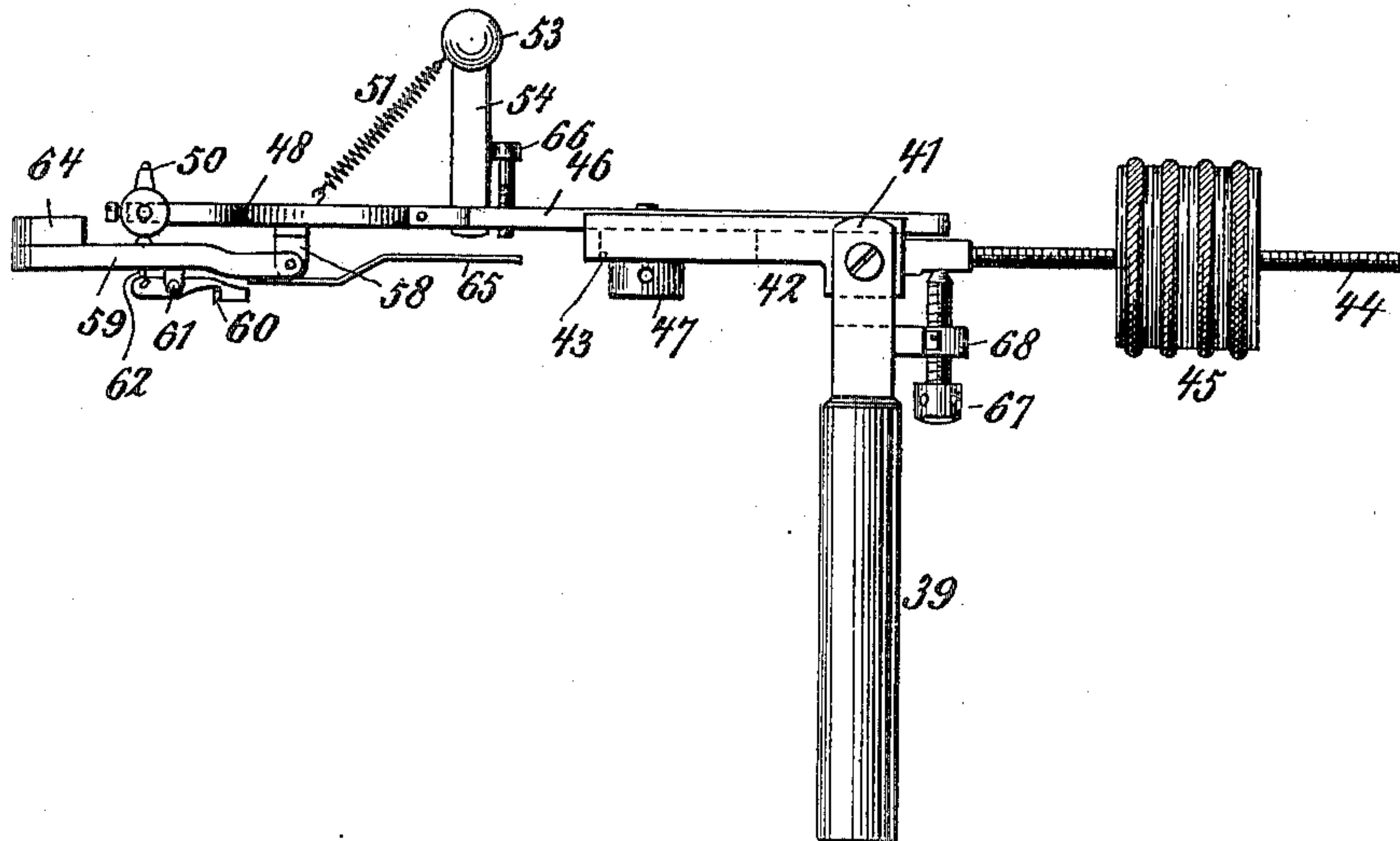
G. BETTINI.  
PHONOGRAPH RECORD DUPLICATOR.

(No Model.)

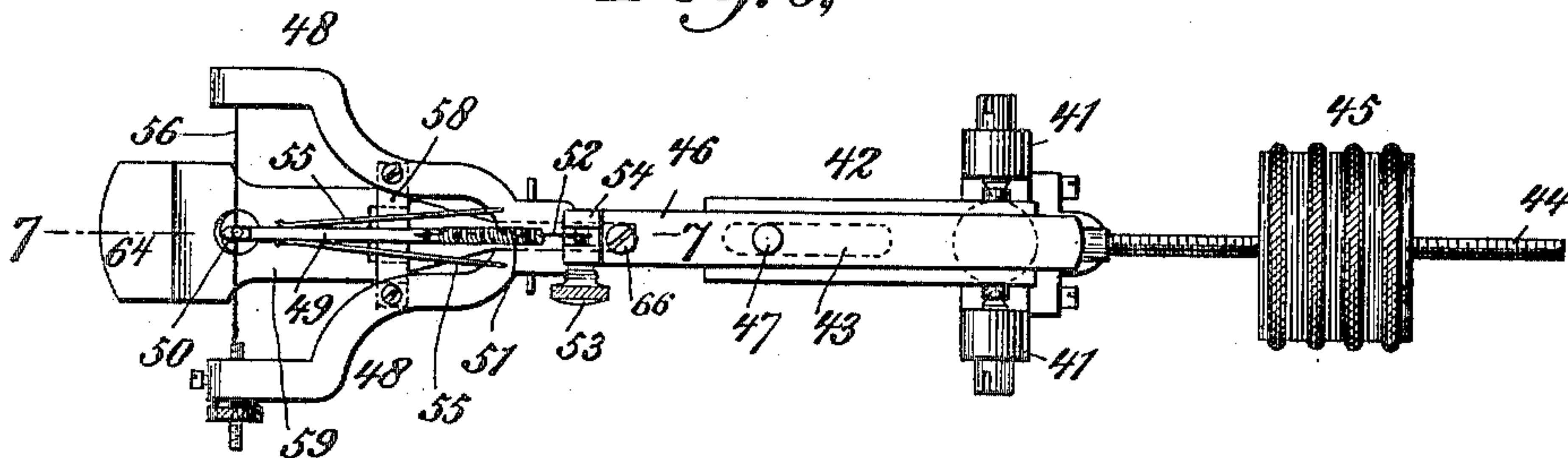
(Application filed July 27, 1897.)

5 Sheets—Sheet 5.

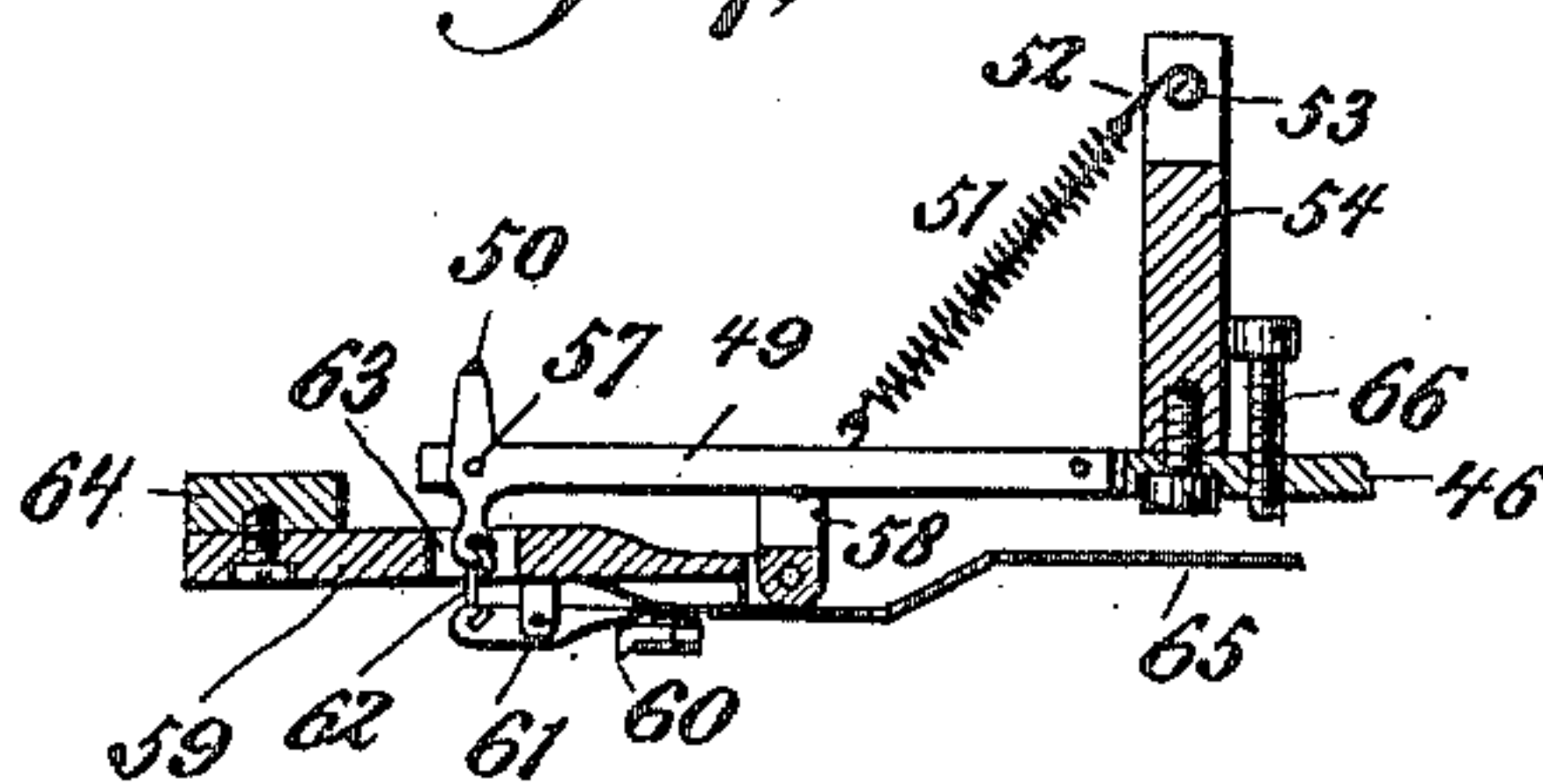
*Fig. 5,*



*Fig. 6,*



*Fig. 7,*



WITNESSES:

*W. H. Raymond*  
*Ernest Robinson*

INVENTOR

*G. Bettini*



# UNITED STATES PATENT OFFICE.

GIANNI BETTINI, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO EDWARD N. DICKERSON, OF SAME PLACE.

## PHONOGRAPH-RECORD DUPLICATOR.

SPECIFICATION forming part of Letters Patent No. 668,154, dated February 19, 1901.

Application filed July 27, 1897. Serial No. 646,072. (No model.)

*To all whom it may concern:*

Be it known that I, GIANNI BETTINI, of the city, county, and State of New York, have invented certain new and useful Improvements in Sound-Record Duplicators, of which the following is a specification.

The present invention relates to machines for reproducing the sound-waves recorded upon a suitable surface and making a duplication of such sound-waves upon a second surface.

In the drawings I have shown a construction embodying the features of the present invention, in which drawings—

Figure 1 is a plan view, certain parts being broken away. Fig. 2 is an end elevational view. Fig. 3 is a section along line 3 3 of Fig. 1. Fig. 4 is a detail view in plan of parts shown in Figs. 2 and 3. Fig. 5 is a side elevation of the parts immediately connected with the record tracing and cutting devices. Fig. 6 is a plan view of the parts shown in Fig. 5, and Fig. 7 is a detail view in section along line 7 7 of Fig. 6.

Like figures of reference refer to like parts throughout the several views of the drawings.

Referring to the drawings in detail, 1 designates a suitable support upon which rests the frame 2 of the machine, which is secured to said support by a clamp 3, extending from a plate 4. Bosses 5 project upwardly from this plate, and a shaft 6, supporting the frame 7, which carries the master record-cylinder, is journaled therein. Also projecting from said plate 4 are webs 8, to which is pivotally secured a plate 9, whose under surface rests against a cam 10. An adjusting-screw 11 passes through the frame 7 and impinges against the upper surface of the plate 9. This adjusting-screw 11 is for the purpose of positioning the master record-cylinder 12 relatively to the record-following stylus. The record-cylinder is moved bodily into and out of operating position by means of the cam 10, which is secured to a shaft 13, journaled in uprights 14, projecting from the plate 4, the shaft 13 having secured to it an operating-handle 15.

The master-cylinder 12 is supported on a shaft 16, which shaft is journaled at approximately its middle portion in an arm 17, pro-

jecting from the frame 7, and is journaled at one end by a conical journal-point projecting from an arm 18 and at the opposite end by a similar journal-point upon a pivoted arm 19. This arm 19 is operated so as to be moved away from its position supporting the end of the shaft 16 by means of a sleeve 20, which is provided with a crank-arm 21, connected to a link 22, which is pivoted to the arm 19, said link 22 being provided with an arc-shaped portion 23. The sleeve 20 is provided with an interior square-shaped opening and is operated by the handle 24, having a square end fitting into the opening in the sleeve 20. By these means the arm 19 is moved away from its position opposite the end of the master record-cylinder 12, so that the master record-cylinder may be taken off of its support and a new record-cylinder placed in position. The cylinder upon which the sound-record of the master-cylinder is to be duplicated is here designated by the numeral 25, and is supported in a position below and to one side of the master-cylinder upon a shaft 26, one end of which is provided with a driving-pulley 27 and a gear-wheel 28, meshing with a gear-wheel 29, which in turn meshes with gear-wheel 30 on shaft 16, which carries the master record-cylinder. The gear-wheels 28, 29, and 30 are connected together by links 31, so as to be always in mesh throughout all variations in position relatively to each other of the master record-cylinder and the cylinder upon which the record is to be duplicated. The shaft 26 is provided with a threaded portion 32, upon which bears a half-round threaded yoke secured to arm 33, whose other end is connected to a sleeve 34 on shaft 35. The sleeve 34 carries the record tracing and duplicating parts and is moved longitudinally of the cylinders at a rate bearing a definite relation to the rate of rotation of the master-cylinder and the cylinder upon which the sound-record of the master-cylinder is to be duplicated.

Clamped upon the sleeve 34 is an arm 36, which extends underneath the cylinder which is to receive the duplication of the sound-record, the end of said arm normally resting upon the rail 37. Formed integrally with said arm 36 is a housing 38, which is adapted to receive a



post 39, upon which are pivotally mounted the record-duplicating parts. The post 39 may be secured in any desired position by means of the set-screws 40. At its upper portion the post 39 branches into forks 41, between which is journaled a channel-piece 42, provided with a slot 43. Projecting rearwardly from the channel-piece 42 is a threaded rod 44, upon which is screwed a counterweight 45, said counterweight being designed to counterbalance the weight of the reproducing-stylus and appurtenant parts. An arm 46 is adapted to fit in the channel-piece 42, being secured therein so as to have longitudinal adjustment by means of a set-screw 47, passing through the slot 43 in the channel-piece. The arm 46 is bifurcated at its outer end into arms 48. Hinged between these arms 48 is the stylus-carrying arm 49, which is provided with a stylus 50. A spring 51 is secured at one end to the arm 49, and the other end is secured to a cord 52, fastened to a thumb-screw 53 on a post 54, the turning of the thumb-screw 53 adjusting the tension of the spring by winding or unwinding the cord 52. Upon each side of the stylus-carrying arm 49 bears a leaf-spring 55, operating to maintain the stylus-carrying arm 49 in alignment with the line running longitudinally through the center of the arm 46. Stretched between the arms 48 is a wire 56, which passes through an eye 57, formed in the stylus 50, and maintains the arm 49 in a plane substantially parallel with the plane of the arm 46. Hinged on a cross-piece 58, extending transversely between the arms 48, is a supporting-piece 59 for the record-cutting stylus 60, which is pivoted on a projection 61 on the supporting-piece 59. The record-cutting stylus is secured to the tracing-stylus 50 by any desired means, as by a wire 62, passing through the aperture 63. The outer end of the supporting-piece 59 is provided with a weight 64 and the opposite end with a tailpiece 65, whose limit of movement is defined by a set-screw 66. For the purpose of limiting the oscillation of the channel-piece 42, upon which are supported the stylus-carrying parts, I provide a set-screw 67, passing through a threaded hole in a lug 68, projecting from the post 39.

An arm 69 carries a cone-bearing adapted to engage the shaft 26 and is hinged, so as to be capable of movement into and out of supporting position for the purpose of removing the cylinder 25, and is locked in its closed position by means of a catch 70.

When a master-cylinder has been copied and its record duplicated on the cylinder 25, the operating-handle 15 is pressed down, thus turning the cam 10 and raising the master-record out of contact with the record-tracing stylus 50. The cutting-stylus is then raised from contact with the cylinder 25 by tilting the arm 36 by means of the rod 71 lifting the same, the rod 71 extending under the end of the arm 36 throughout the length of its path of

movement longitudinally of the phonograph-cylinders. The rod 71 and the rod 72, which are connected by end pieces 73, are secured to the plate 9 and are moved with said plate when it is tilted by a cam 10. A limiting-stop 74 is secured on the rod 71 and is adapted to be secured in any desired position by means of a set-screw 75.

What I claim as new is—

1. In an apparatus for duplicating sound-records, the combination of two moving surfaces, one of which carries a sound-record, means for duplicating the sound-record of one of said moving surfaces upon the other, and means for moving one of said moving surfaces away from the sound-record-duplicating parts and moving the sound-record-duplicating parts out of contact with the other moving surface, substantially as specified.

2. In an apparatus for duplicating sound-records, the combination of a pivotally-mounted record-cylinder, pivotally-mounted sound-duplicating parts, a second cylinder, and means for simultaneously moving the record-cylinder out of contact with the sound-duplicating parts and the sound-duplicating parts out of contact with the second cylinder, substantially as specified.

3. The combination of a rotatably-mounted cylinder, a pivoted support for one end of said cylinder, a link connected to said pivoted support, and a crank to which said link is secured, substantially as specified.

4. The combination of a rotatably-mounted cylinder, a pivoted support for one end of said cylinder, a link connected to said pivoted support and provided with an arc-shaped portion, and a crank connected to said arc-shaped portion, substantially as specified.

5. In an apparatus for duplicating sound-records, the combination of two moving surfaces, a sound-record-duplicating part, means for adjusting the position of one of said moving surfaces relatively to the sound-record-duplicating part, and means for moving said record-surface away from the sound-record-duplicating part and said part away from the other moving surface, substantially as specified.

6. In an apparatus for duplicating sound-records, the combination of two moving surfaces, an adjustably-mounted sound-record-duplicating part, means for adjusting the position of one of said moving surfaces relatively to the sound-record-duplicating part, and means for moving said record-surface away from the sound-record-duplicating part, and said part away from the other moving surface, substantially as specified.

7. In an apparatus for duplicating sound-records, a counterbalanced pivoted support, an arm carrying a tracing-stylus hinged to said support, lateral guides for said arm, and means for holding the tracing-stylus arm in substantially the same horizontal plane as the pivoted support, substantially as specified.



8. In an apparatus for duplicating sound-  
records, the combination of a longitudinally-  
adjustable support, a tracing-stylus pivoted  
thereon, an independently-pivoted cutting-  
5 stylus and a connection between the tracing-  
stylus and cutting-stylus, substantially as  
specified.

In testimony whereof I have signed my  
name to this specification in the presence of  
two subscribing witnesses.

GIANNI BETTINI.

Witnesses:

E. D. GREENE,  
B. L. CLARKE.