

No. 798,087.

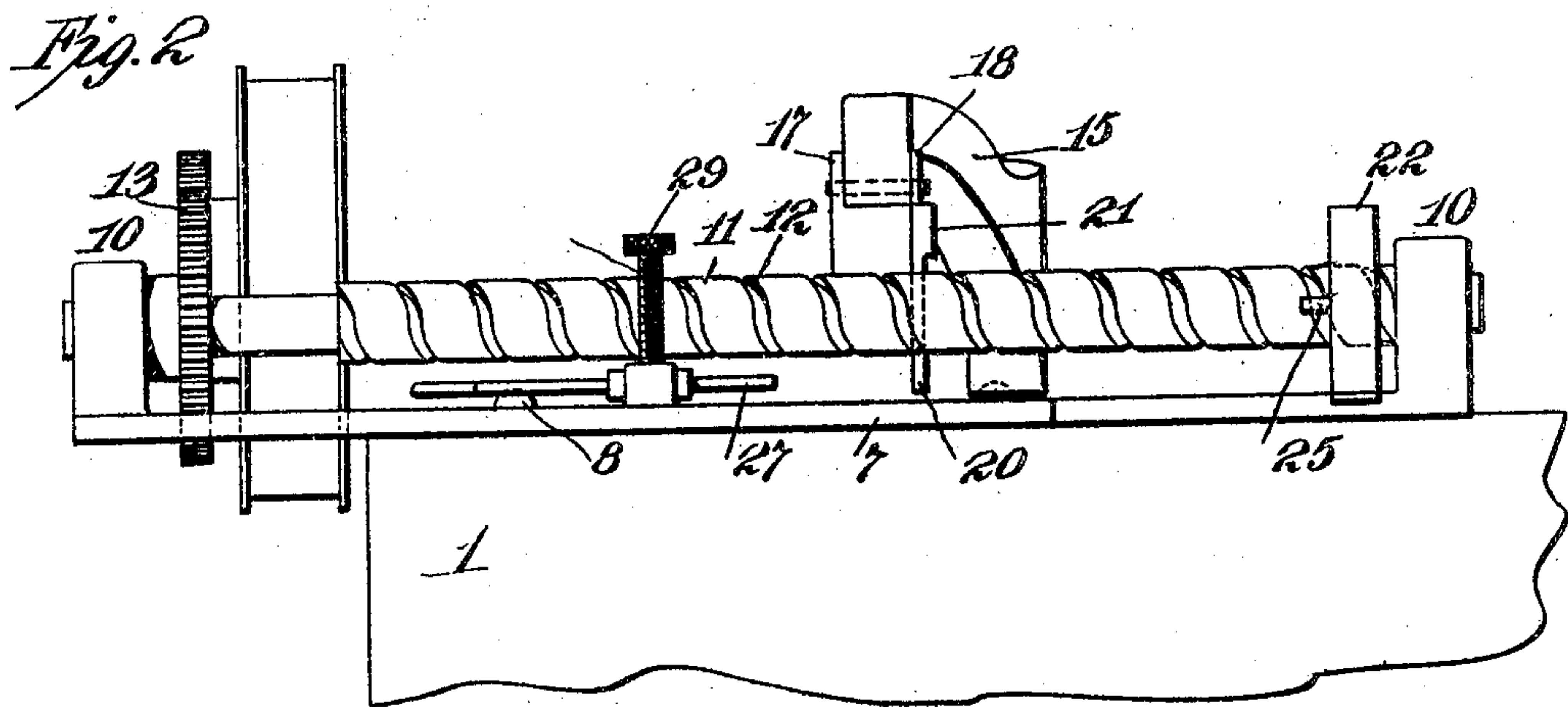
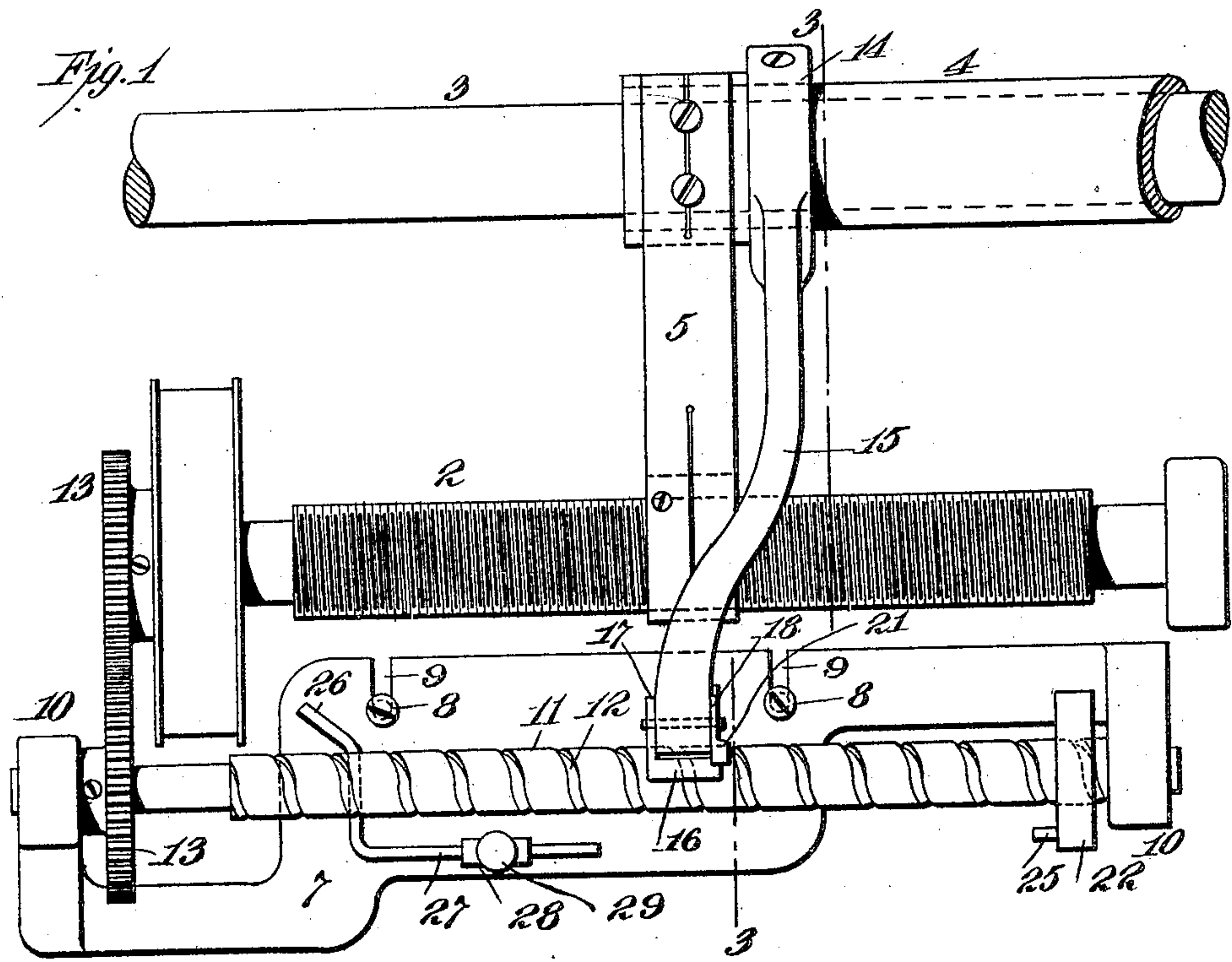
PATENTED AUG. 29, 1905.

E. L. AIKEN.

REPEATING ATTACHMENT FOR PHONOGRAPHS.

APPLICATION FILED JUNE 10, 1904.

2 SHEETS—SHEET 1.



Witnesses:

*Delos Holden*  
*Wm. L. MacArthur*

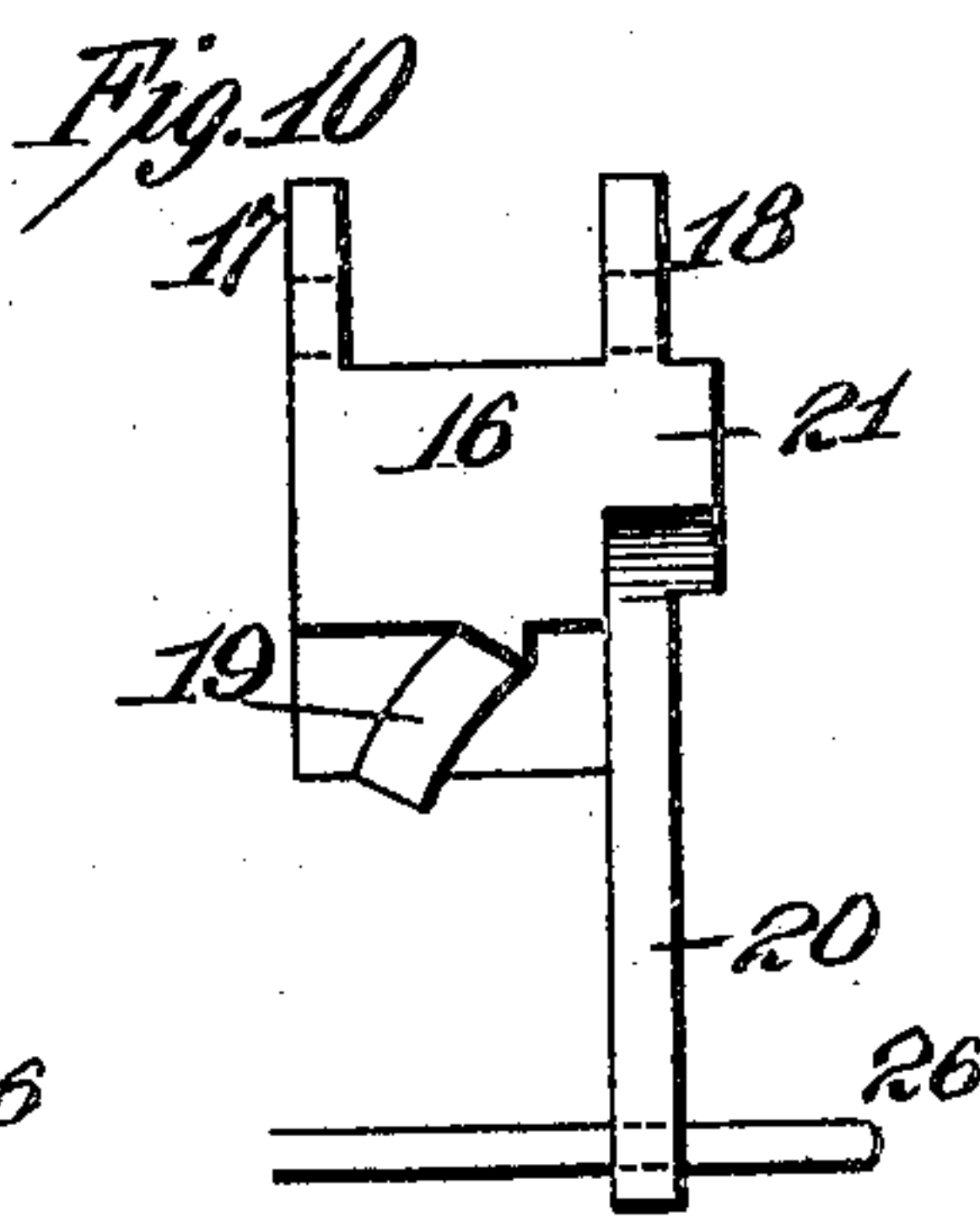
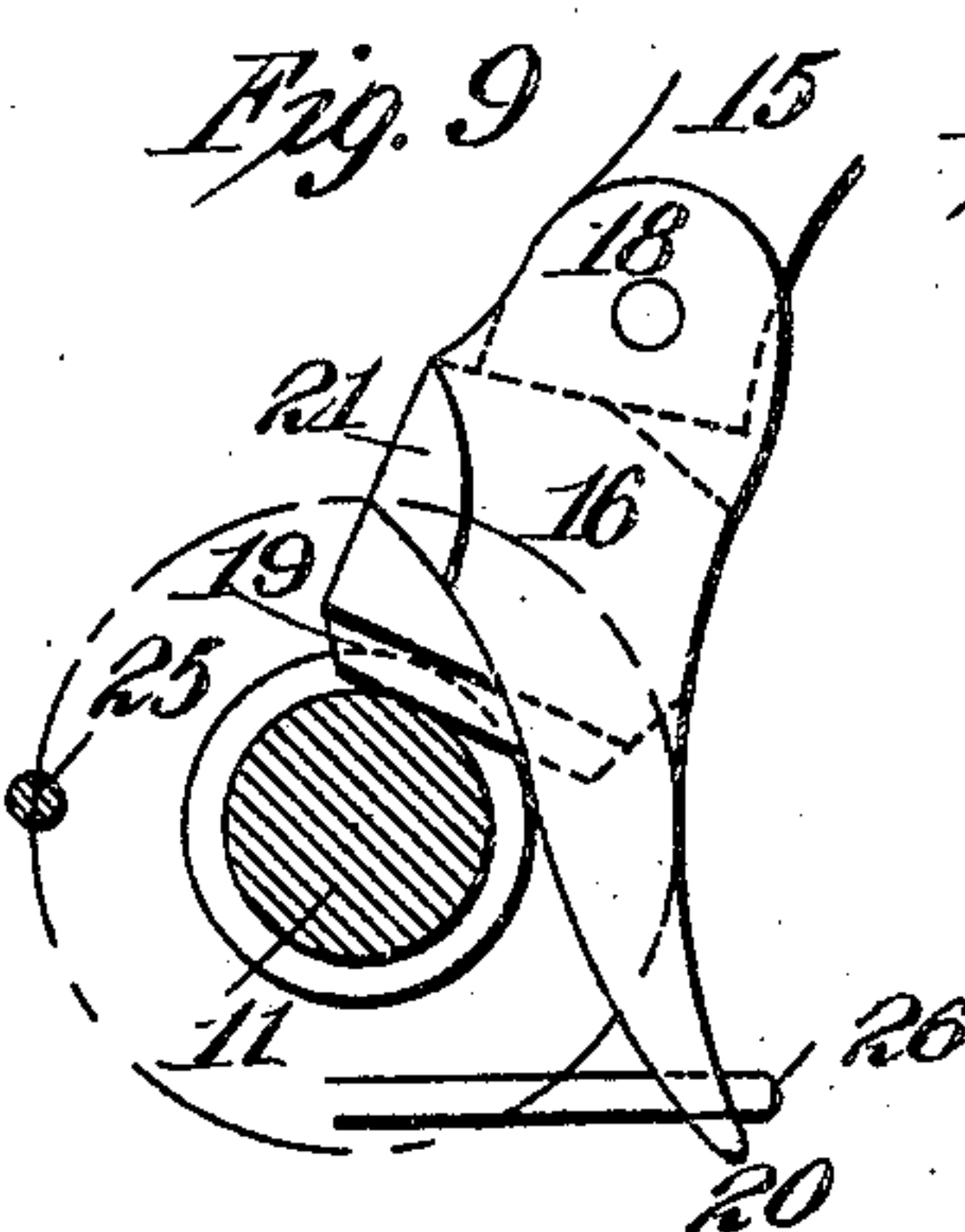
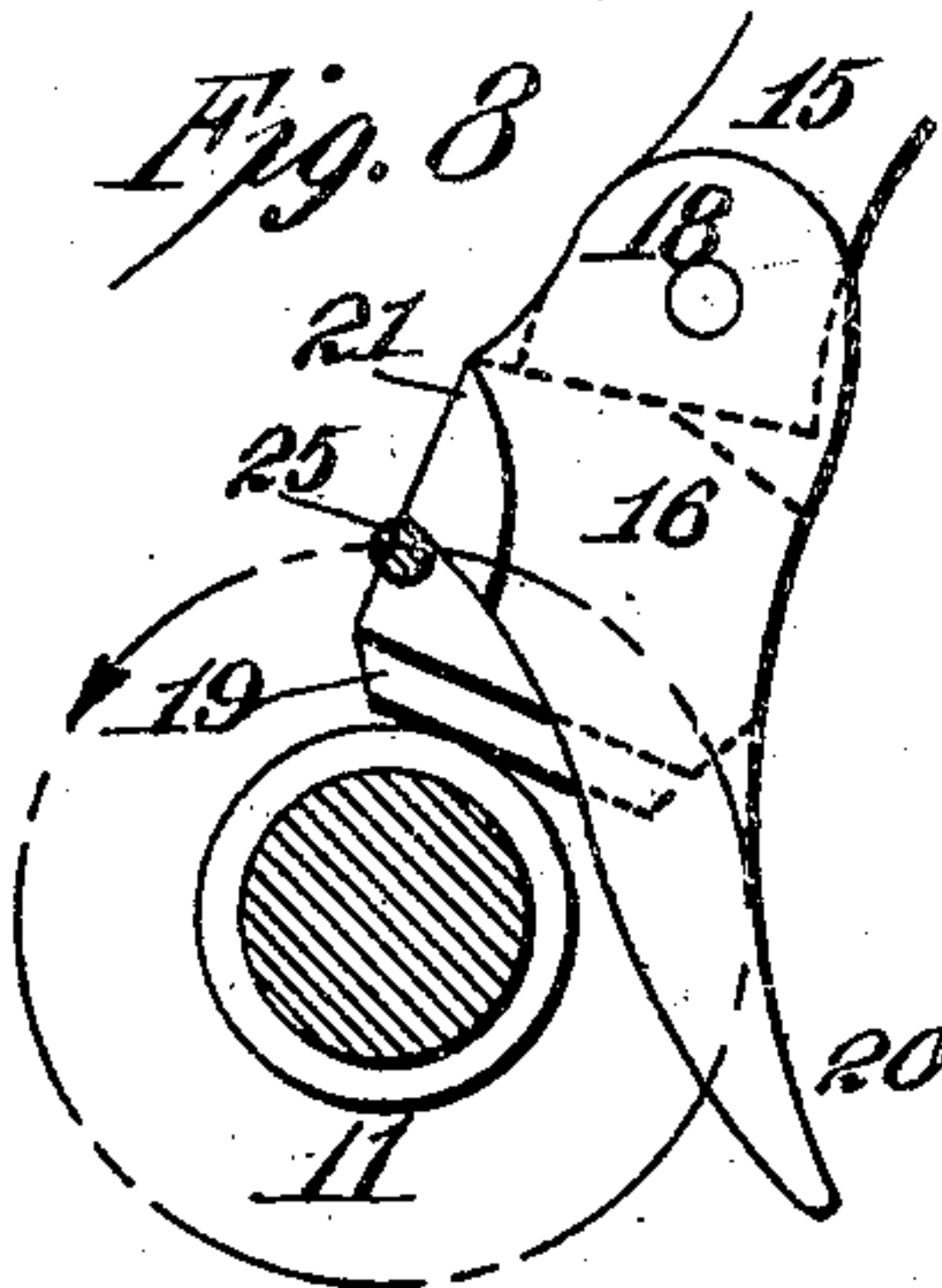
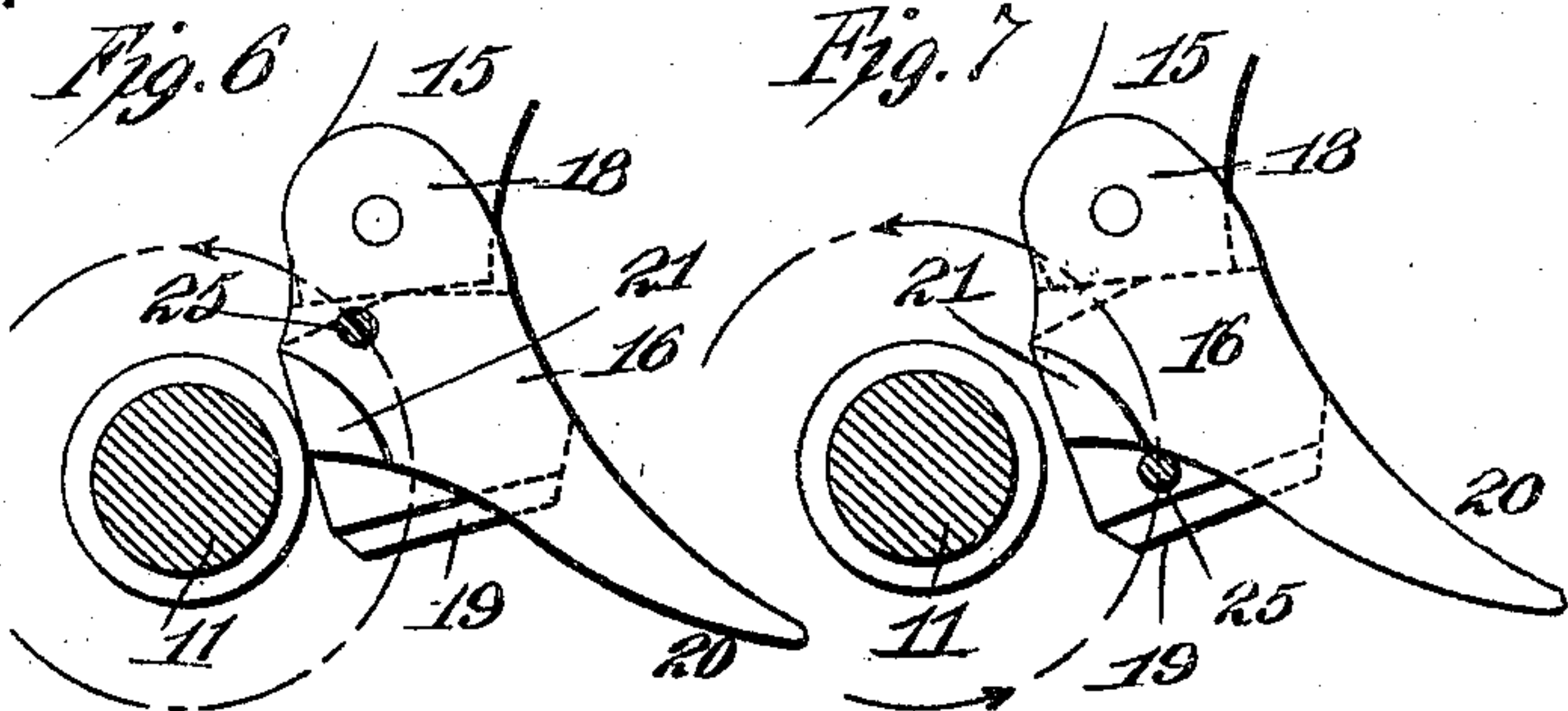
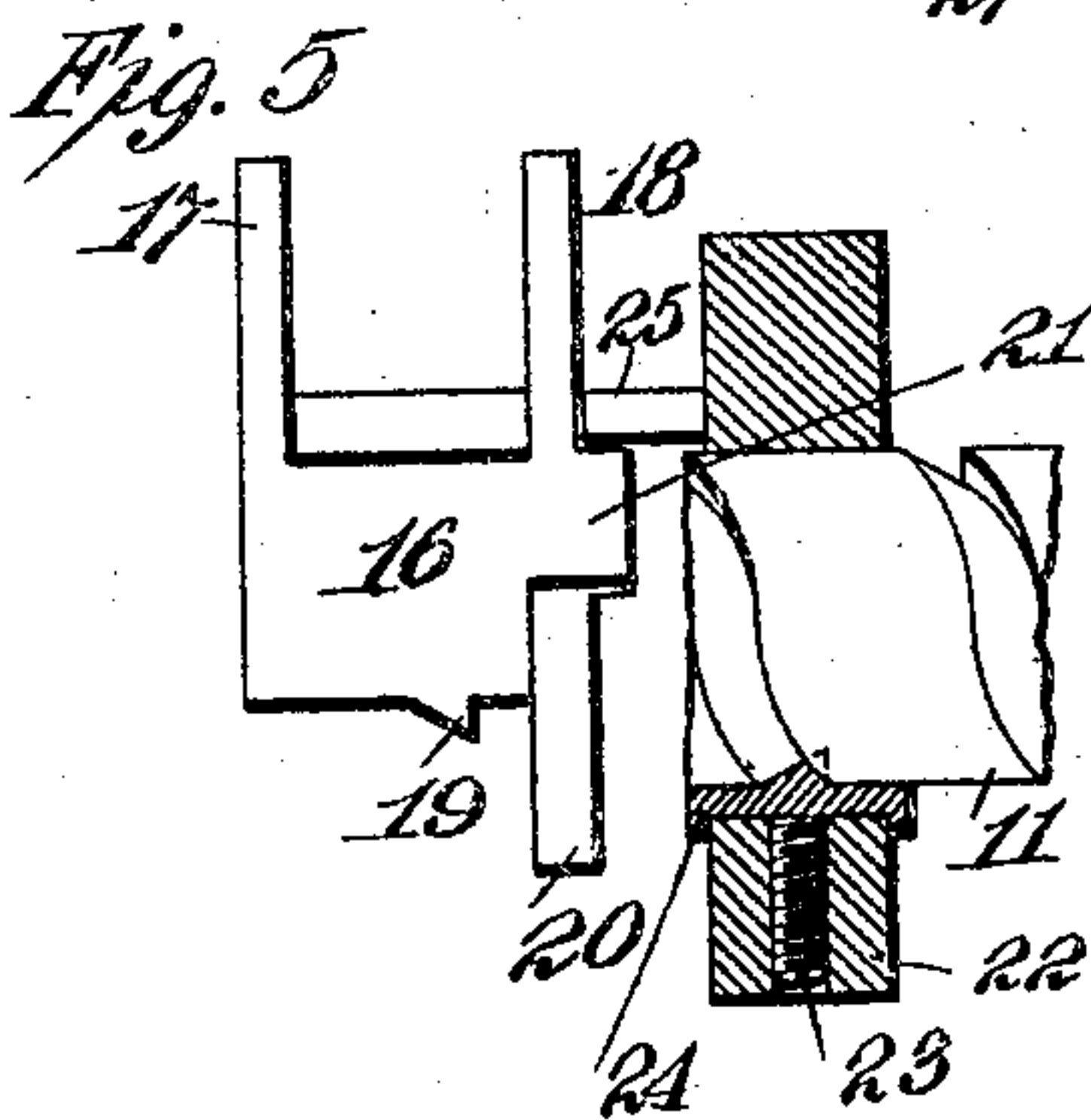
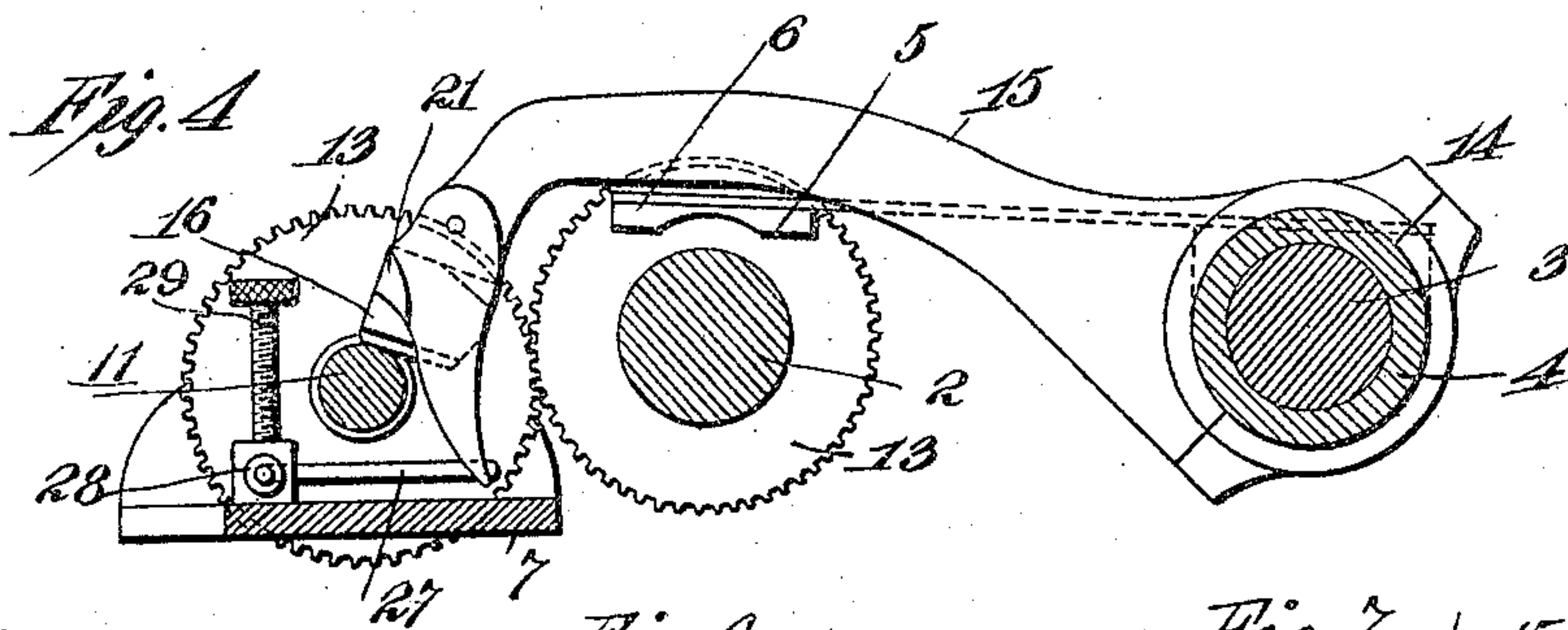
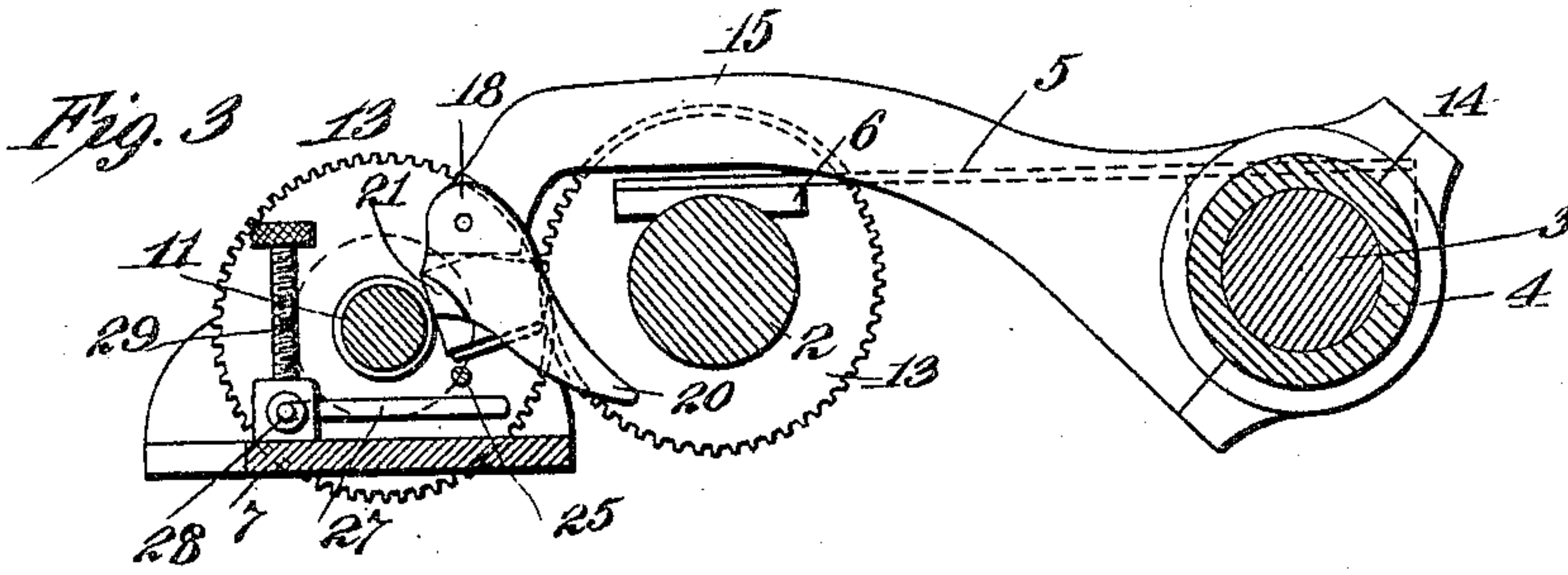
Inventor

*Edward L. Aiken*  
by *Frank L. Aiken*  
Attorney

E. L. AIKEN.  
REPEATING ATTACHMENT FOR PHONOGRAPHS.

APPLICATION FILED JUNE 10, 1904.

2 SHEETS—SHEET 2.



Witnesses:

Delos Holden.  
Mina C. Mac Arthur

Inventor

Edward L. Aiken  
by Frank L. Aiken  
Attorney



# UNITED STATES PATENT OFFICE.

EDWARD L. AIKEN, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO NEW JERSEY PATENT COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## REPEATING ATTACHMENT FOR PHONOGRAPHS.

No. 798,087.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed June 10, 1904. Serial No. 211,917.

*To all whom it may concern:*

Be it known that I, EDWARD L. AIKEN, residing at 643 Springdale avenue, East Orange, in the county of Essex and State of New Jersey, have invented a certain Repeating Attachment for Phonographs, of which the following is a description.

My invention relates to improvements in repeating attachments for phonographs or other talking-machines, adapted either for the purpose of repeating a selection indefinitely or for use in combination with any appropriate form of coin-operated mechanism for controlling the motor, whereby when the selection has been once reproduced by the prepayment of a coin the reproducer will be returned to the starting position to permit successive reproductions.

The object of my invention is to provide a device for the purpose which shall be effective and positive in its operation, of but few parts, capable of being readily attached to standard types of phonographs and other talking-machines, and which when applied will not in any way affect the operation of the device or prevent the reproducer from being fully raised to permit the records to be changed or the reproducer to be repaired or removed. At the same time the device provides for simple and effective adjustment whereby the reproducer may be caused to engage or be disengaged from the record immediately before and after the selection has been reproduced.

My invention has more particularly for its object the provision of means whereby the members which cooperate to raise the reproducer or diaphragm-carrier may obtain a broad bearing or contact surface for the lifting operation.

In the accompanying drawings, Figure 1 is a plan view showing a part of the main shaft, feed-screw, part of the back rod, sleeve, spring-arm, and feed-nut of a phonograph with my present improvements applied thereto; Fig. 2, a front view of the same; Fig. 3, a sectional view on the line 3 3 of Fig. 1, showing the repeating mechanism out of operation, as when the reproducer is in engagement with the record; Fig. 4, a corresponding view showing the repeating mechanism in operation. Figs. 5, 6, 7, 8, 9, and 10 are detail views of the lifting and return mechanism.

In all of the above views corresponding parts are represented by the same numerals of reference.

The phonograph is provided with the usual bed-plate 1, on which is mounted in suitable bearings (not shown) the main shaft 2, which carries the usual mandrel and which for a part of its length is cut with a fine screw-thread to feed the reproducer lengthwise of the record. The usual stationary back rod 3 is shown, on which is mounted the usual sleeve 4, arranged to slide on said rod and carrying the reproducing devices. (Not shown.) Secured to the sleeve 4 are the usual diaphragm-carrying arm 4<sup>a</sup> and spring-arm 5, carrying the nut or nuts 6, engaging the threaded portion of the main shaft 2, all as is common in this art. The sleeve 4, together with the arm 4<sup>a</sup>, may be termed the "diaphragm-carrier."

In applying my improved repeating attachment to a phonograph I make use of a small compact base 7, which by means of screws 8, engaging slots 9, is removably and adjustably secured to the bed-plate 1. The base 7 is provided with two bearings 10 10, in which is mounted a return-shaft 11, having a coarse-pitch return-screw 12. The return-shaft 11 is driven from the main shaft 2 by any approved gearing; but I preferably use two spur-gears 13 13, mounted on the two shafts, respectively, engaging together, as shown. Secured to the sleeve 4 by a split collar 14 is an arm 15, having a bend at its center, so that it projects over in front of and substantially in line with the spring-arm 5. Pivoted at the downwardly-projecting free end of the arm 15 is a lifting and return dog, the special form, proportions, construction, and operation of which are shown in Figs. 3 to 10, exclusive. This lifting-dog comprises a block 16, having two ears 17 and 18 at the sides, by means of which the dog is pivoted to the arm 15. The upper face of the block 16 is formed on two angles, (see Figs. 3, 4, 6, 7, 8, and 9,) whereby the dog will be capable of moving between the extreme positions, which are determined by the engagement of one or the other of the angular faces with the bottom end face of the arm 15. One of these extreme positions is shown in Fig. 4, the other extreme position being somewhat beyond the normal position of the parts shown in Fig. 3. The under side of the block 16 is formed with



a rib 19 of the proper size and at the correct angle to engage the thread of the return-shaft 12. The ear 18 is provided with a downwardly and rearwardly extending tail 20, by means of which the dog will be disengaged from the return-screw, as will be explained. Extending out from the side of the tail 20, at its upper portion, is a small lug or projection 21, whose under face partakes of the same curve as the tail 20, as shown. Mounted on the return-screw 12 is a disk 22, having a screw 23, whose inner end bears upon a small key 24, engaging the thread of the return-screw, so that by rotating the disk it may be adjusted longitudinally of the return-screw, and by tightening the screw 23 the disk may be securely locked in any position of its longitudinal adjustment.

In order to elevate the arm 15 and swing the dog to engage it with the return-screw when the record has been reproduced, I provide the disk 22 with a pin or projection 25, which normally—*i. e.*, when the parts are in the position shown in Fig. 3—travels in a path encircling the path of the lug 21. To illustrate this, I show in Fig. 3 the pin 25 and in dotted lines the path which it transcribes relatively to the lug 21. In order to trip the dog and determine the position at which the reproducer shall again engage the record, I provide an inclined arm 26, arranged in the path of the tail 20, and said arm is formed integrally with a rod 27, passing through a sleeve 28, secured to the base 7 and engaged by a set-screw 29, so that the position of the curved arm or cam 26 may be adjusted.

When the reproducer is in engagement with the record and the instrument started, the feed-nut 6 will be in engagement with the threaded portion of the main shaft 2, and the lifting-dog by its weight will hang in the position shown in Fig. 3 immediately behind the return-screw 12, but out of engagement therewith. Consequently the phonograph will operate in the usual way to effect the reproduction, the return-shaft being rotated continuously. As the reproducer approaches the end of the record the lug 21 will in being slowly moved toward the disk 22 be gradually overlapped by the pin 25, which for a number of revolutions will encircle said lug. (See Figs. 3 and 6.) When, however, the pin 25 engages the tail 20, the dog will be moved rearwardly to its limit, (see Fig. 7,) whereupon the upward movement of the pin 25 will lift the arm 15, so as to elevate the nut 6 from the feed-screw and the reproducer from the record. This feature is of great importance, for the reason that the forward feed of a phonograph-carriage as commercially constructed—*i. e.*, the pitch of the feed-screw—is only one one-hundredth of an inch. Consequently the first contact of the rotating member and traveling member cannot be more than one

one-hundredth of an inch in width and may be anything less. Under ordinary conditions this width of contact is not sufficient to accomplish the lifting in a reliable manner, because as soon as the feed-nut is lifted from the feed-screw the carriage frequently slides back, so that the lifting members are separated and the carriage falls, and this difficulty becomes much worse as soon as the parts become even slightly worn. An exceedingly narrow bearing-surface will, however, be sufficient to swing the dog on its pivot, because there is practically no resistance to such motion. The change of position of the dog throws a wide bearing-surface into the path of the rotating projection just before the lifting operation and renders it impossible for the carriage to fall. By reason of the circular path transcribed by the pin 25 the latter not only elevates the arm 15, but before leaving the lug 21 swings the dog forwardly (see Fig. 8) until the rib 19 is brought above the return-screw, so as to be engaged by the thread of the screw immediately after the pin leaves the lug 21. By reason of the rotation of the return-screw 12 the dog will be maintained in the position shown in Fig. 4 with the rib 19 in engagement with said screw. In this position the return-screw moves the parts rearwardly at a rapid rate, owing to the coarseness of the pitch of the return-screw, until the tail 20 of the dog engages the cam 26, whereupon the dog will be swung rearwardly, disengaging the rib 19 from the return-screw and permitting the feed-nut 6 and reproducer to again engage the feed-screw and record, respectively. By longitudinally adjusting the disk 22 on the return-screw in the manner explained the pin 25 will always bear a definite relation to the thread of the screw, so that immediately after the pin leaves the lug 21 the rib 19 will be engaged by the thread of the screw. In this way the return movement of the screw will move the dog sufficiently away from the disk 22 by the time the pin 25 once again approaches the tail 20 as to clear the parts, so that the pin 25 will not strike the said tail. If, on the other hand, this adjustment was not effected, there would be the danger of the rib not being engaged by the thread of the return-screw soon enough to start the return movement before the pin 25 again engaged the tail 20.

Having now described my invention, what I claim as new therein, and desire to secure by Letters Patent, is as follows:

1. In a repeating attachment for talking-machines, the sound-box and means for supporting and progressively moving the same when in its operative position, in combination with a return feed-screw and means for elevating the sound-box, comprising a rotating member, and a member traveling with the sound-



box toward said rotating member and provided with a contact-surface of progressively-increasing width, substantially as set forth.

2. In a repeating attachment for talking-machines, the sound-box and means for supporting and progressively moving the same when in its operative position, in combination with a return feed-screw and means for elevating the sound-box comprising a projection rotating in a plane and a projection extending in the direction of said progressive movement and traveling with the sound-box toward said plane, said projections normally moving in paths which do not intersect, whereby said projections are permitted to overlap, one of said projections being so pivoted that when moved on its pivot, its new path intersects the path of the other projection, substantially as set forth.

3. In a repeating attachment for talking-machines, the combination with the diaphragm, carrier, feed-nut, feed-screw and return-screw of a dog secured to said carrier by a pivot parallel to said return-screw and provided with a contact-surface of increasing width and means which engages said dog and oscillates it, and which then engages the wider portion of said dog presenting a substantially greater overlap and raises the sound-box carrier, substantially as set forth.

4. In a repeating attachment for talking-machines, the combination with the diaphragm-carrier, feed-nut, feed-screw and return-screw, of an arm secured to the carrier, a dog pivoted to said arm, a lug carried by said dog and means rotating with the feed-screw for successively engaging said dog, and lug, substantially as set forth.

5. In a repeating attachment for talking-machines, the combination with the diaphragm-carrier, feed-nut, feed-screw and return-screw, of an arm secured to the carrier, a dog pivoted to said arm, a disk carried by the return-screw and adjustable in line with the thread

thereof, and a projection on said disk cooperating with said dog to raise the carrier, substantially as set forth.

6. In a repeating attachment for talking-machines, the sound-box and means for progressively moving the same when in its operative position, in combination with a return feed-screw and means for elevating the sound-box, comprising a rotating member and a member traveling with the sound-box toward said rotating member, said traveling member being provided with a contact-surface having one portion so placed that it overlaps the rotating member during more than one revolution thereof, whereby a substantial bearing-surface is obtained for the lifting operation, and having another portion so placed as to intersect the path of said rotating member and thereby initiate the lifting operation, substantially as set forth.

7. In a repeating attachment for talking-machines, the sound-box and means for supporting and progressively moving the same when in its operative position, in combination with a return feed-screw and means for elevating the sound-box, comprising a rotating member, and a member traveling with the sound-box toward said rotating member, one of said members being provided with a contact-surface having one portion so placed that it overlaps the other member during more than one revolution of the rotating member, whereby a substantial bearing-surface is obtained for the lifting operation, and having another portion so placed as to intersect the path of the other member, and thereby initiate the lifting operation, substantially as set forth.

This specification signed and witnessed this 9th day of June, 1904.

EDWARD L. AIKEN.

Witnesses:

FRANK L. DYER,  
MINA C. MACARTHUR.