

No. 656,527.

Patented Aug. 21, 1900.

A. DINKEL.
CHUCK.

(Application filed Nov. 20, 1899.)

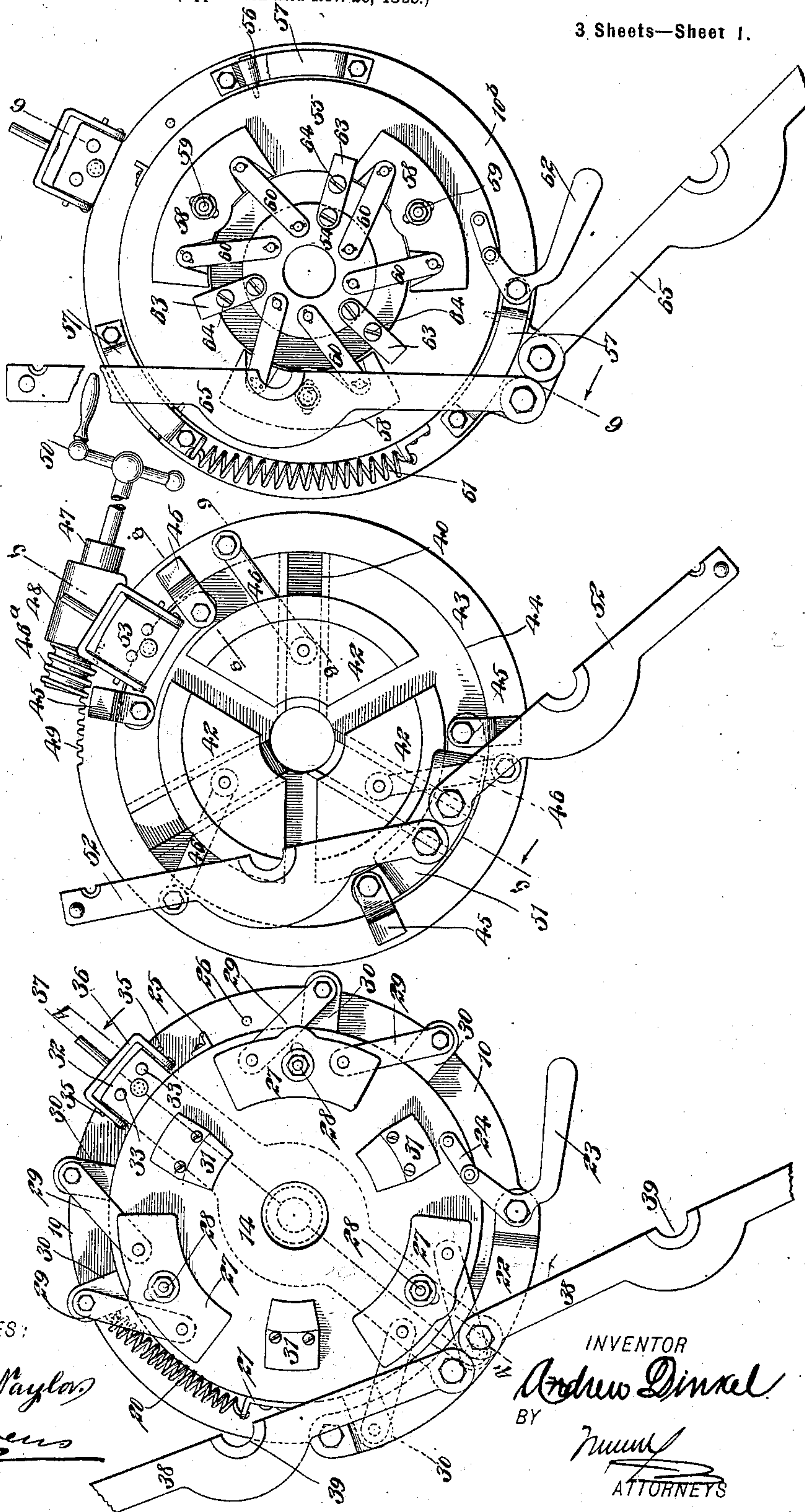
(No Model.)

3 Sheets—Sheet 1.

Fig. 3-

Fig. 2-

Fig. 1-



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Fig. 4.

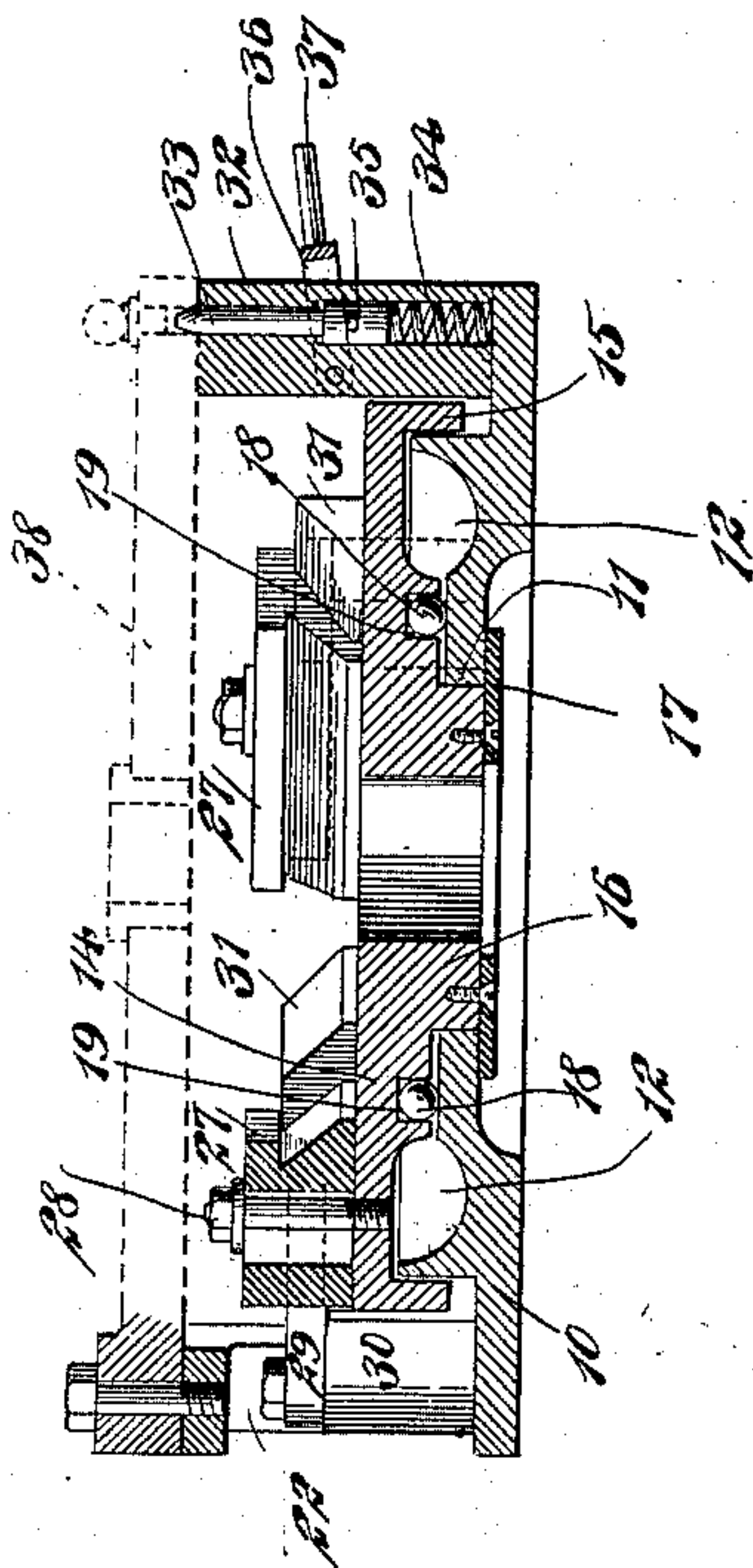


Fig. 5.

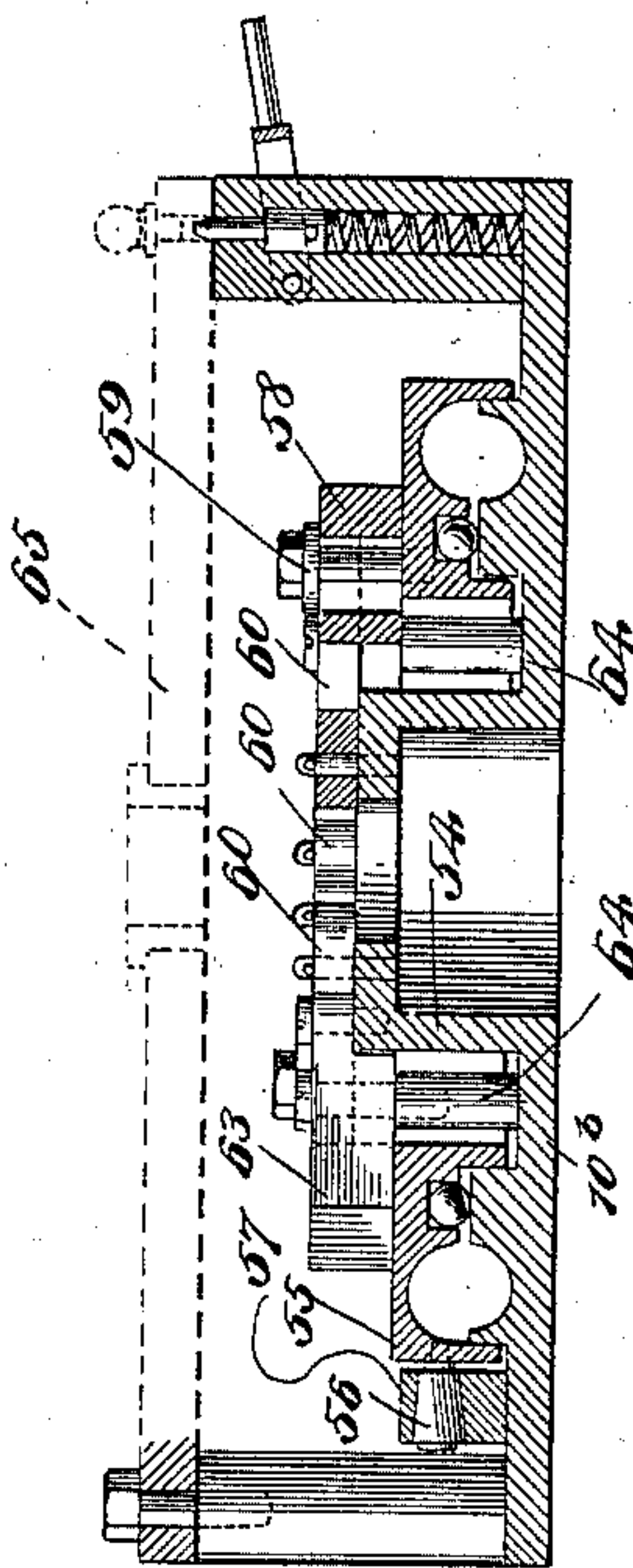
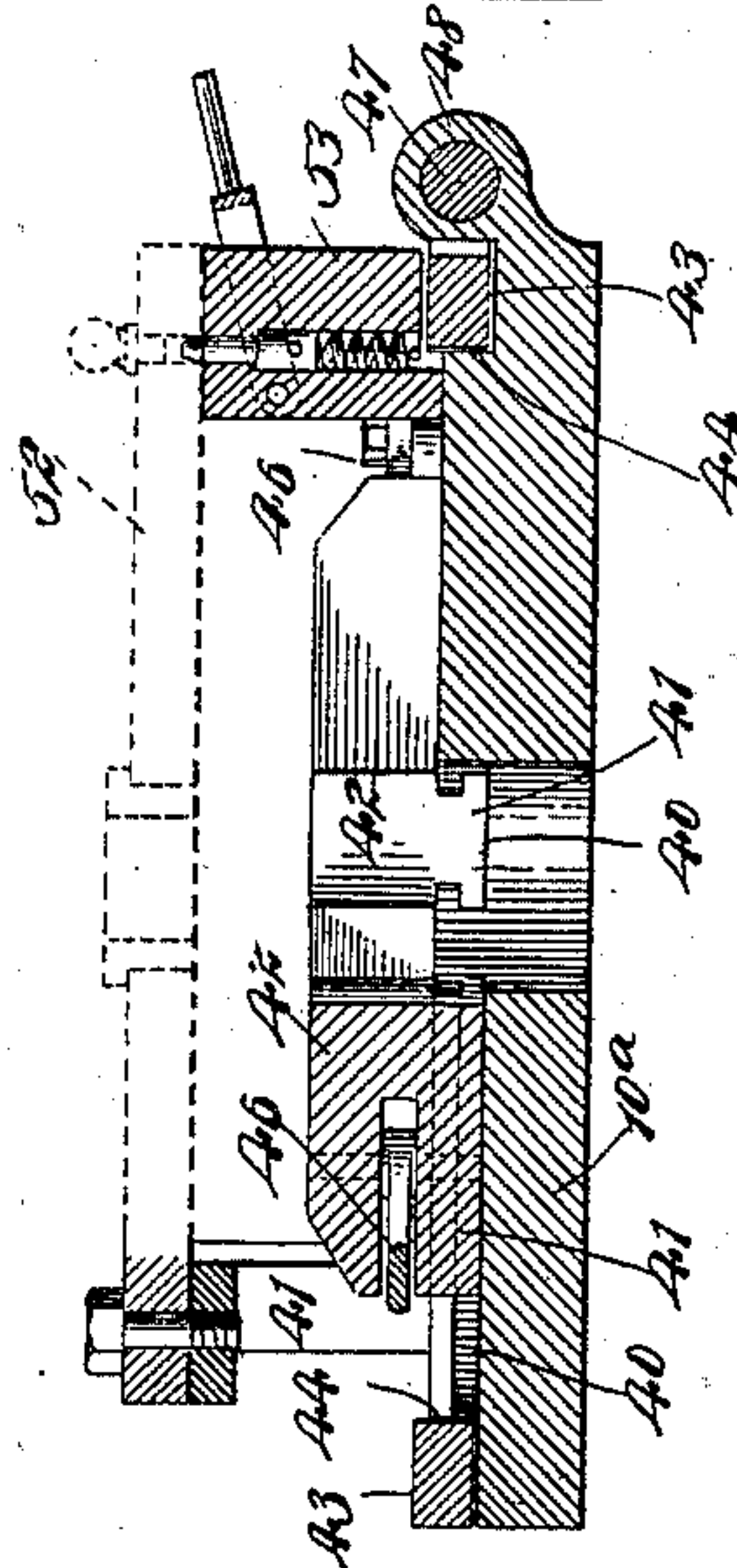


Fig. 6.



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Fig. 5.

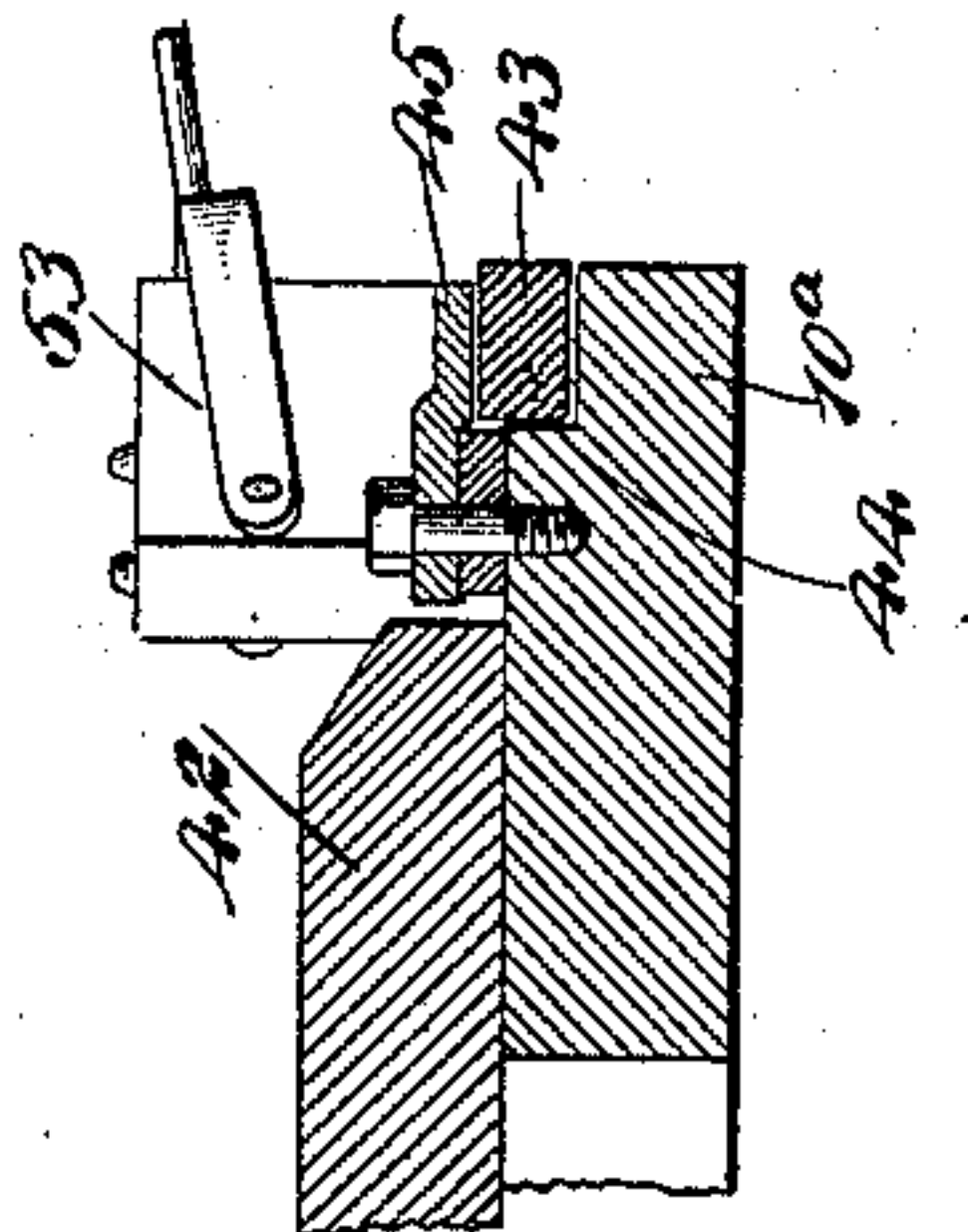


Fig. 6.

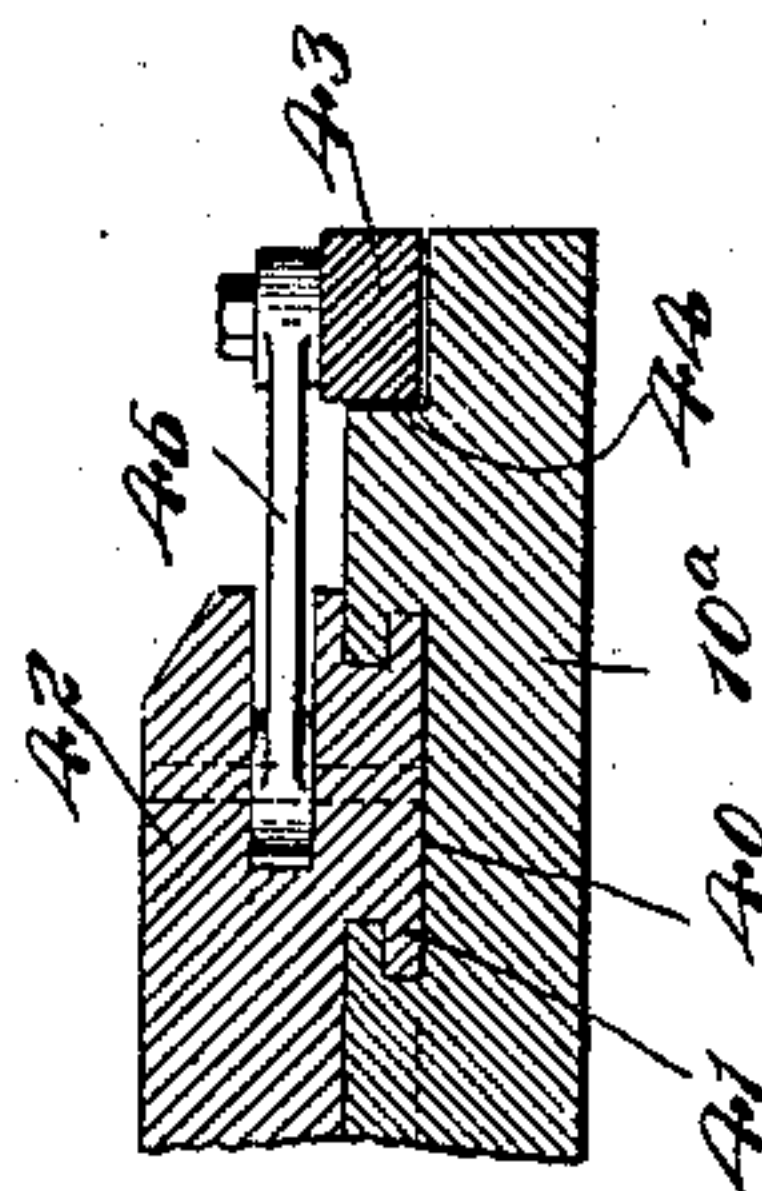
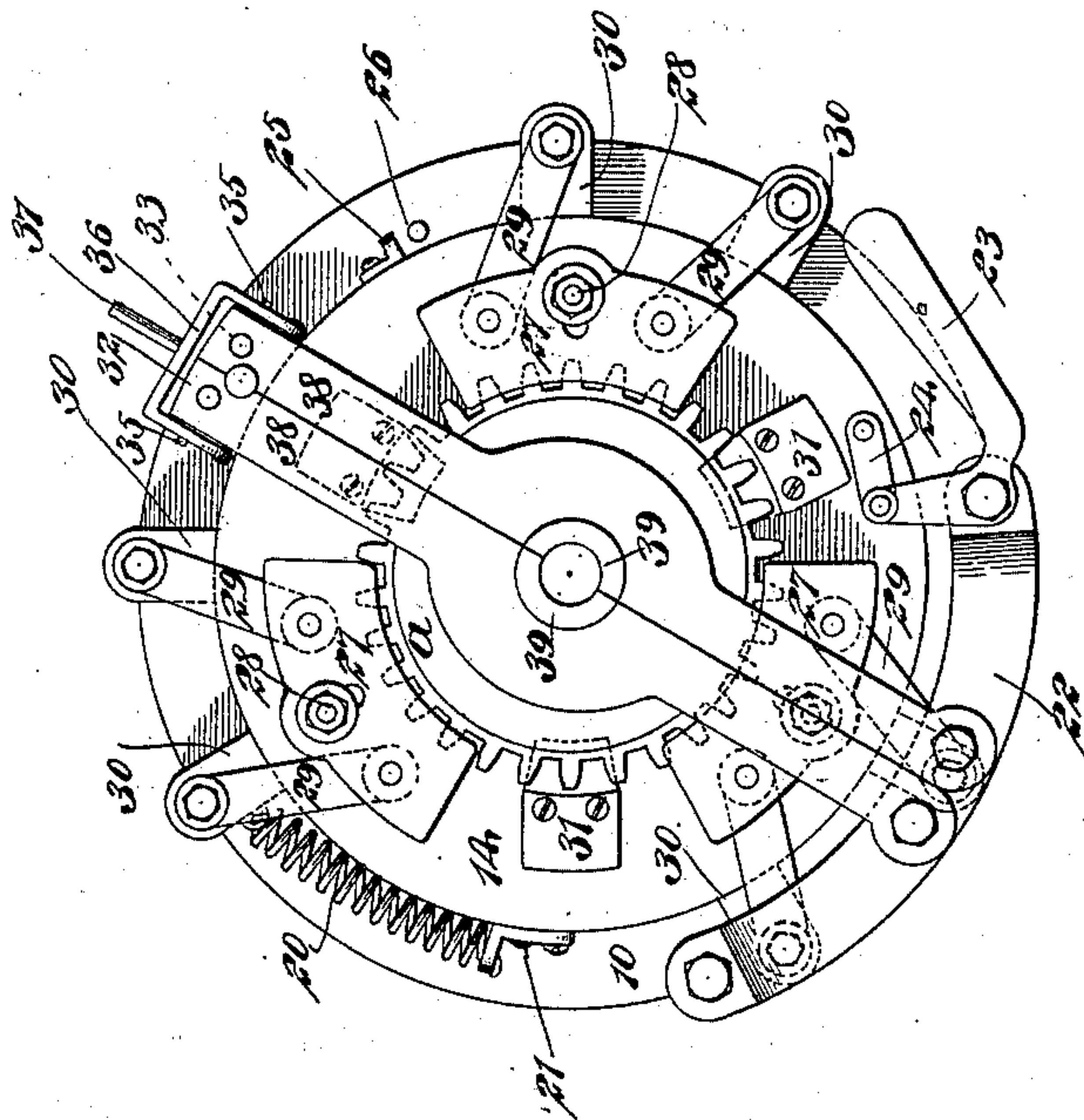


Fig. 7.



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UNITED STATES PATENT OFFICE.

ANDREW DINKEL, OF AUBURN, NEW YORK.

CHUCK.

SPECIFICATION forming part of Letters Patent No. 656,527, dated August 21, 1900.

Application filed November 20, 1899. Serial No. 737,590. (No model.)

To all whom it may concern:

Be it known that I, ANDREW DINKEL, a citizen of the United States, and a resident of Auburn, in the county of Cayuga and State of New York, have invented a new and Improved Chuck, of which the following is a full, clear, and exact description.

This invention relates to a chuck adapted particularly for holding work the center of which is to be bored—for example, for holding a gear while the hub thereof is being bored.

This specification is the disclosure of several forms of the invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the chuck, showing it in open position. Fig. 2 is a similar view of a slightly-modified form of the invention. Fig. 3 is a similar view of another modification. Fig. 4 is a sectional view on the line 4 4 of Fig. 1. Fig. 5 is a sectional view on the line 5 5 of Fig. 2. Fig. 6 is a sectional view on the line 6 6 of Fig. 3. Fig. 7 is a plan view of the chuck shown in Fig. 1, with the parts in closed position and illustrating a gear held in the chuck. Fig. 8 is a section on the line 8 8 of Fig. 2, and Fig. 9 is a section on the line 9 9 of Fig. 2.

As shown in Figs. 1, 4, and 7, the chuck comprises a base 10, which may be of any desired form, adapting it to be fastened in place—for example, to the face-plate of a lathe. This base is formed with a centrally-disposed orifice 11, the center of the base being raised above the outer portion of the same. The base is also provided with an annular groove 12, formed in the raised middle portion of the base, the purpose of which will be fully described hereinafter.

On the base 10 is mounted a circular carrier 14, provided at its outer edge with a downwardly-extending annular flange 15, encircling the enlarged middle portion of the base and covering the groove 12. This carrier 14 has a central extension or hub 16 projecting loosely into the opening 11 of the base 10, and the carrier 14 is fastened in place by a plate 17, secured to the middle portion 16 of the

plate and also bearing against the under side of the base. Antifriction-balls 18 are mounted in an annular ball-race 19, formed in the under side of the carrier 14 in position to hold the balls 18 on the raised central portion of the base inside of the groove 12. By these means the carrier is mounted to oscillate freely on the base. The groove 12 serves to receive the grit filings and like foreign matter from the ball-race 19 and from the space adjacent thereto between the parts 10 and 14. This keeps the ball-race clear and prevents clogging of the moving parts.

A retractile spiral spring 20 is attached to a lug 21 on the carrier 14 and to a part of the base 10, as shown, this spring serving normally to throw the carrier 14 into the position shown in Fig. 7. A bracket 22 is attached to the base 10 at one side of the carrier 14 and is elevated above the carrier, as shown in Fig. 4. To one end of this bracket 22, at a point approximately level with the carrier 14, an elbow-lever 23 is fulcrumed, the lever having connection by a link 24 with the carrier. When this lever is moved outward to the position shown in Fig. 1, the carrier 14 may be rocked against the tension of the spring 20 to the position shown in said figure. In order to limit the movement of the carrier 14 under the influence of the spring 20, I provide a lug 25, attached to the periphery of the carrier, as shown in Figs. 1 and 7, and in position to engage a pin 26, standing rigidly on the base 10, when the parts are in the position shown in Fig. 7.

Mounted on the carrier 14 are three jaws 27, which are attached to the carrier by means of pins 28, rigid on the same and projecting through radially-disposed slots in the respective jaws. Each jaw is connected with two links 29, the links extending rearward tangentially to the carrier and being pivotally connected with the outer edges of the base 10 through the medium of pivots seated in lugs 30, formed on the base, such lugs bearing against the outer side of the flange 15 of the carrier to assist in steadying the same. Now it is clear that when the carrier 14 is thrown from one position to the other the jaws 27 are caused to move in or out by reason of their connection with the links 29, which are also connected with the base 10, the base

being stationary relatively to the carrier. When the parts are in the locked position, (shown in Fig. 7,) the spring 20 will be contracted, and, assuming that a piece of work, such as the gear *a*, indicated in such view, is to be held, the jaws 27 will be forced against the work and held engaged by the spring 20, even though the force of the tool may not yet be applied to the work. It will also be seen that when the tool is applied to the work the direction of rotation can be so arranged as to cause the jaws to exert a compressive strain on the links, thus resulting in more firmly binding the work within the jaws. As shown in Figs. 1, 4, and 7, blocks 31 may be fastened to the carrier between the jaws to facilitate centering the work on the carrier previous to the engagement of the jaws with the work.

Opposite the bracket 22 a standard 32 is rigidly mounted on the base outside of the carrier and provided with two pins 33, pressed upward slightly beyond the standard by means of expansive spiral springs 34, contained in the standard. (See Fig. 4.) These pins 32 have fingers 35 attached thereto and extended transversely through slots in the standard 32, so that the pins 35 may be engaged by a yoke 36, mounted to swing on the standard 32 and provided with a handle 37, by which it may be operated. By pressing this yoke downward the pins 33 may be moved downward against the tension of the springs 34. The bracket 22 carries two pivotally-mounted bars 38, which are adapted to swing to the open position (shown in Fig. 1) and the closed position, (shown in Fig. 7,) in which latter position the pins 33 will engage with openings in the bars 38, thus holding the bars in the closed position shown. To release the bars from the position shown in Fig. 7, the yoke 36 should be pushed down, thus disengaging the pins 33, which permits the bars to be swung to the position shown in Fig. 1. These bars are provided with matching recesses 39, which register with each other when the parts are in the position shown in Fig. 7, thus forming an opening in which may be fitted the tool which works with the chuck. It will be seen, therefore, that the bars 38 form a tool-guide, causing the tool to be held centrally in the proper position during the operation of the several parts.

In Figs. 2, 5, 8, and 9 I have illustrated a modification of the invention in which the carrier 14 is dispensed with and a worm and gear are provided for operating the jaws, such devices making it unnecessary to employ the spring 20. In this form of my invention the base 10^a is provided with a number (preferably three) of undercut grooves 40 in its upper face. In these grooves are arranged to slide the gibs 41 of the jaws 42. The jaws 42 are segmental in form and are movable from the open position (shown in Fig. 2) to the closed position, in which the radial

side edges of the jaws will be engaged with each other. An annulus 43 is mounted to turn on the upper face of the base 10^a outside the jaws, the base having a shoulder 44, against which the inner side of the annulus 43 engages. The annulus 43 is further held in place by means of fingers 45, which are attached rigidly to the base inside of the annulus and which project outwardly over the annulus, as shown best in Fig. 8, thus preventing the displacement of the annulus upwardly from the base. To the annulus 43 are pivoted three links 46, which are also pivoted to the jaws 42. When the annulus is turned, the links 46 will impart rotary sliding movements to the jaws, causing them to open and close, as will be understood. The annulus 43 is driven by a worm 46^a, which is carried on a shaft 47, mounted in a bearing 48, attached to the base 10^a, as shown best in Fig. 5. This worm 46^a engages worm-teeth 49, formed on the annulus, and the shaft 47 has a handle 50, enabling the shaft to be turned manually. This provides a means for moving the annulus and also a means for firmly locking it in any desired position. A bracket 51 is attached rigidly to the base inside of the annulus and is raised above the jaws 42, so as to carry bars 52, similar to the bars 38, before described, and performing the same functions. A standard 53 is erected on the base opposite the bracket 51 and carries devices for holding the bars 52, which bars are the same as those described in connection with the bracket 32, mentioned above. The standard 53 is rigidly supported on the base and overhangs the annulus 43, as shown in Fig. 5. In connection with this form of my invention it will be observed that the work is held by the positive action of the jaws connected therewith, such devices in turn being actuated by the worm 46^a and gear 49 of the annulus 43.

The form of the invention illustrated in Figs. 3 and 6 is a chuck adapted for gripping internal surfaces on the work, and it embodies the same general principles as those embodied in the devices shown in Figs. 1 and 4. The base 10^b in Figs. 3 and 6 has its central portion raised in the form of a dome 54. A carrier 55 is mounted to turn on the base 10^b around the dome 54 and is provided at its outer edge with rollers 56, in the form of a frustum of a cone, and which work in guideways 57, attached to the base 10^b, and by means of which the carrier is held to move in the desired manner. The carrier may also be provided with ball-bearings similar to those previously described in connection with Figs. 1 and 4. Mounted on the carrier 55 are a number (preferably three) of jaws 58, which are held to slide radially on the carrier by means of pins 59, projecting through radially-disposed slots in the jaws. The jaws may, however, be guided in radially-disposed T-slots, thus dispensing with the pins 59. These jaws 58 are provided with pivotally-attached links 60,

such links extending inward from the jaws and being pivoted on the top of the dome 54 of the base 10^b, as shown. The carrier 55 is provided with a retractile spring 61 and with a lever 62, similar to the parts 20 and 23 previously described. By means of these parts 61 and 62 the jaws may be actuated, causing them to engage and disengage their outer surfaces with and from an interior surface on the work. Attached to the dome 54 are fingers 63, which project outwardly to and bear loosely on the upper surface of the carrier 55 to steady the same and prevent it from being jarred upward from the base. These fingers 63 are braced against the main portion of the base by means of fastening devices 64, as shown. The chuck illustrated in Figs. 3 and 6 is provided with bars 65 for holding the tool similarly to the bars 52 and 38 before described and provided with similar devices for mounting and holding them.

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

1. A chuck, provided with a base, jaws for engaging the work, means for operating the jaws, the jaws and said means being carried on the base and a bar mounted on the base and extending across the same in front of the jaws to guide the tool.

2. A chuck, having a base, jaws mounted on the base to engage and hold the work, and two bars mounted to swing on the base and provided with matching recesses which register to form a guide in which the tool may be held when the bars are thrown to engaged position.

3. The combination with a chuck, of a bar mounted to swing thereon and serving to guide a tool, a spring-pressed pin serving to engage the bar to hold the same in closed position, and means for withdrawing the pin to release the bar.

4. The combination with a chuck, of a bar mounted to swing thereon, the bar constituting a guide for the tool, a standard mounted on the chuck, a spring-pressed pin carried by the standard and serving to engage the bar to hold it in operative position, and a yoke mounted to swing on the standard and having connection with the pin to retract the same.

5. In a chuck, the combination of a base, a carrier mounted to oscillate thereon, jaws mounted to move radially on the carrier, and links extending between the jaws and the base to drive the jaws upon a relative movement of the base and carrier.

6. In a chuck, the combination of a base, a carrier mounted to move thereon, jaws carried by the carrier and movable thereon to engage and disengage the work, links extend-

ing between the jaws and the base to actuate the jaws, a spring extending between the carrier and the base, and a hand-lever in connection with the carrier and with the base, to move the carrier against the spring.

7. In a chuck, the combination of a base, a carrier mounted to oscillate thereon, inward of the outer edges of the base, jaws mounted and movable radially on the carrier, and links connected with the jaws and extending outwardly beyond the carrier and having connection with the base to drive the jaws from a relative movement of the base and carrier.

8. In a chuck, the combination of two relatively-turnable parts, jaws mounted in fixed guideways on one of said parts to move radially thereof, and links extending between the jaws and the other of such relatively-movable parts, to operate the jaws by a relative movement of said parts.

9. In a chuck, the combination of two relatively-turnable parts, jaws mounted on one of said parts to move radially thereof, links extending between the jaws and the other of said parts, to operate the jaws by a relative movement of said parts, and a spring working between the said relatively-turnable parts to throw the jaws into a certain position.

10. A chuck, comprising jaws to hold the work, and two parts mounted to move into engagement with each other adjacent to the jaws and formed with matching recesses which register to form a guide in which a tool may be held when the parts are thrown to engaged position.

11. In a chuck, the combination of two relatively-movable parts, jaws mounted to slide on one of said parts, links extending between the jaws and the other of said parts, the jaws being operative by a relative movement of the said relatively-movable parts, a spring working between the said relatively-movable parts, and means for moving said parts against the tendency of the spring.

12. In a chuck, the combination of a base having a centrally-disposed orifice and also having a raised middle portion, a carrier having a centrally-disposed projection fitted to turn in the orifice of the base and also having a downwardly-disposed edge flange encircling the middle portion of the base, jaws mounted to move radially on the carrier, links extending between the jaws and the base, and means for turning the carrier on the base to actuate the jaws.

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

ANDREW DINKEL.

Witnesses:

GEO. W. BENHAM,
M. E. CONGER.