

No. 793,448.

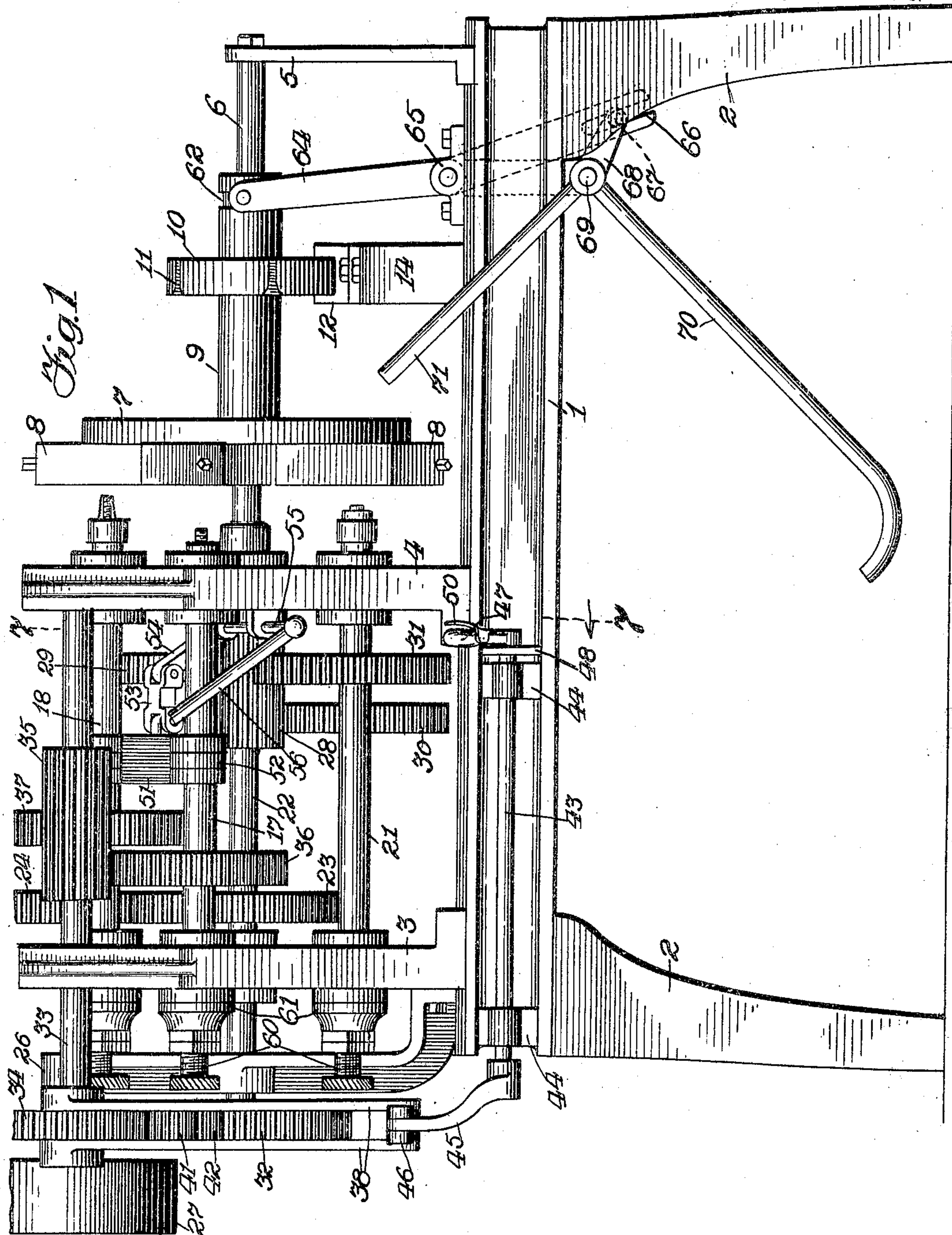
PATENTED JUNE 27, 1905.

P. KREPP.

LATHE.

APPLICATION FILED OCT. 27, 1903.

4 SHEETS—SHEET 1.



Witnesses:
Geo. B. Rowley.
E. C. Potter.

Inventor;
P. Krepp.
By W. C. Everett & Co.
Attorneys.

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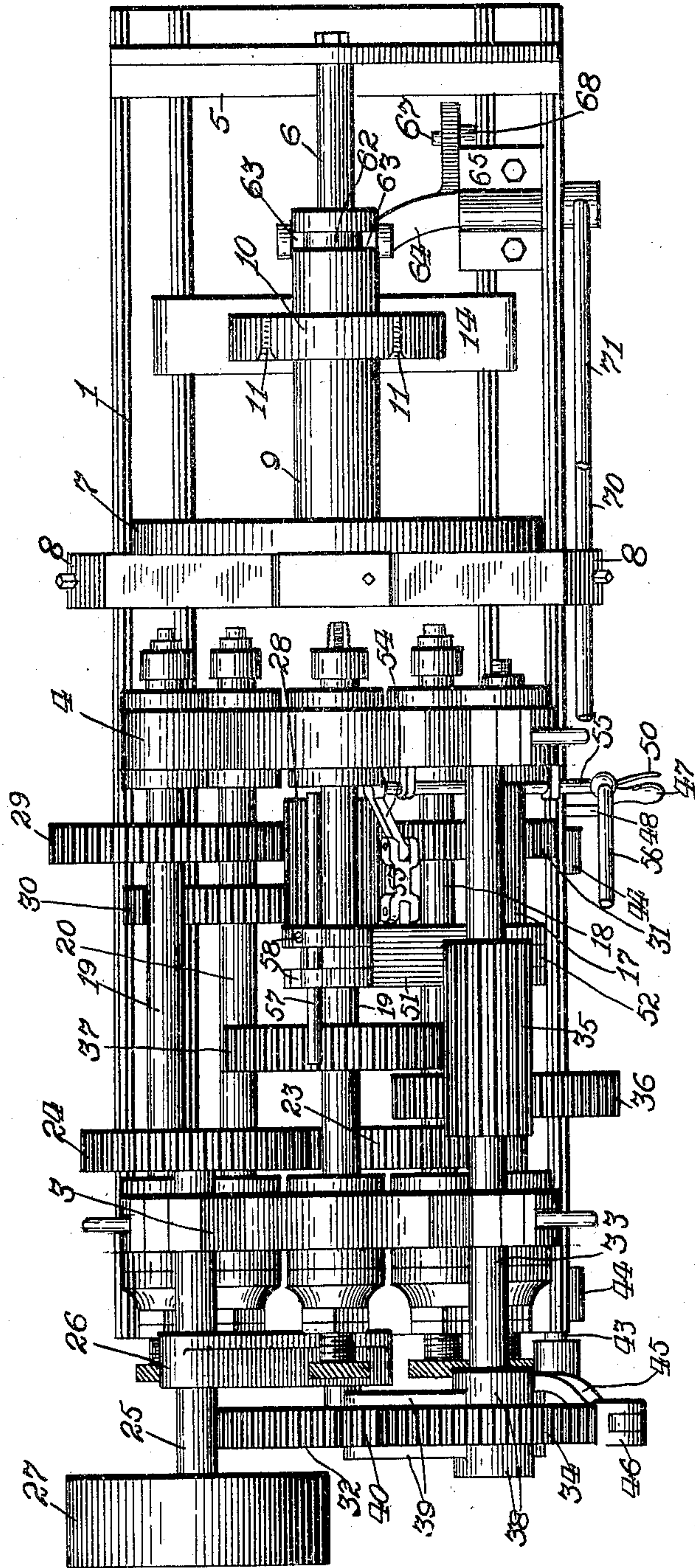
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4 SHEETS—SHEET 2.

Fig. 2



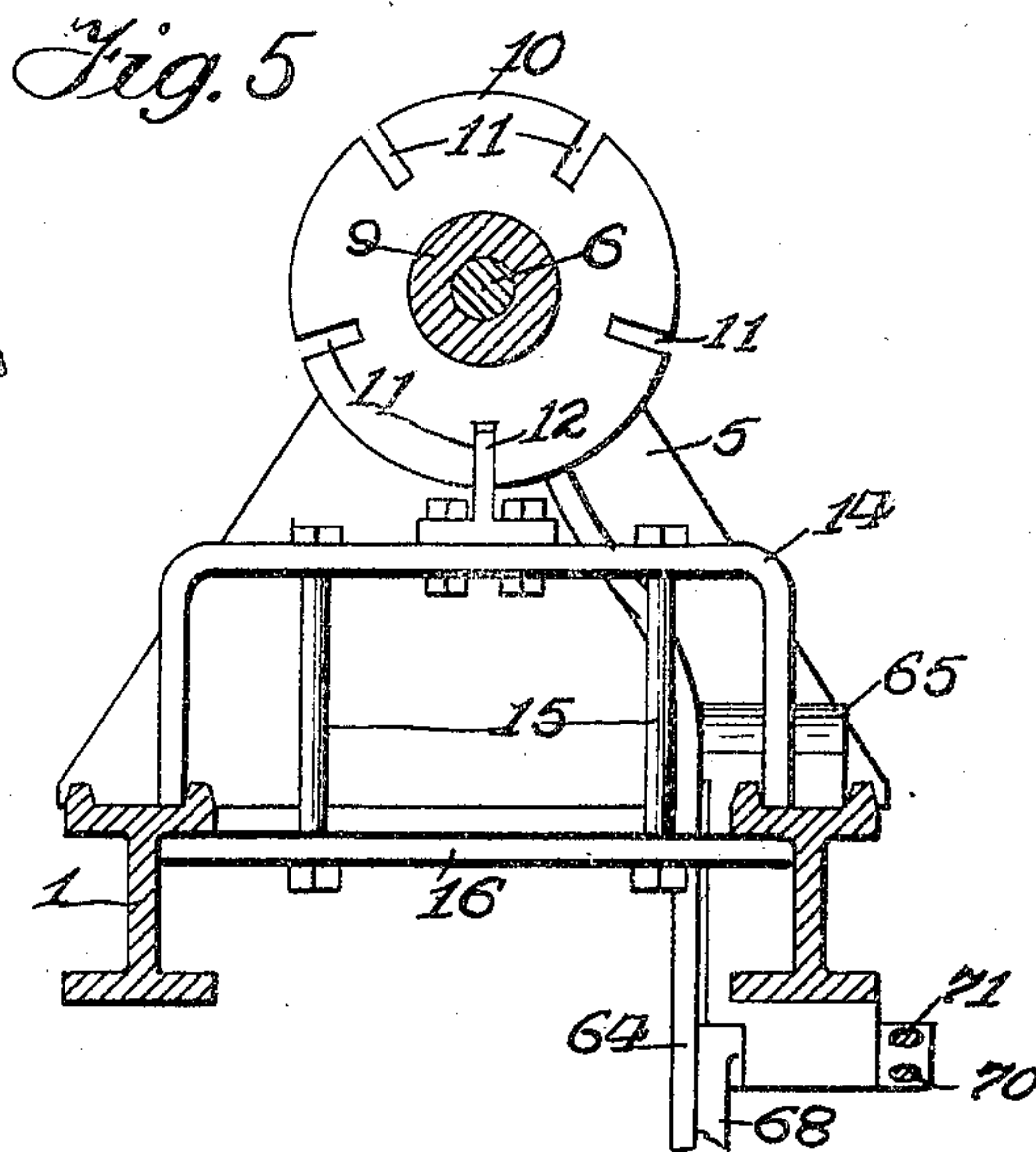
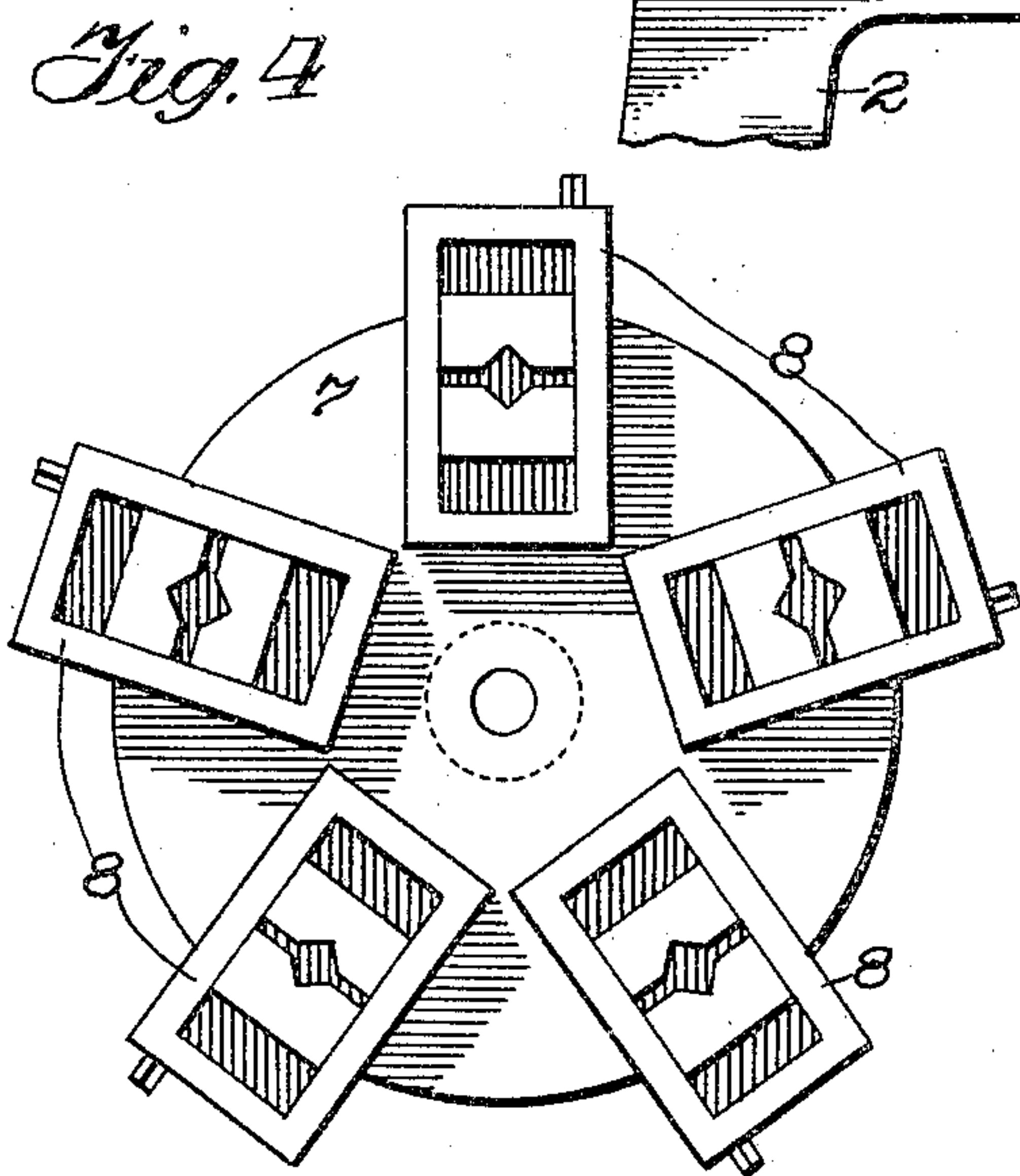
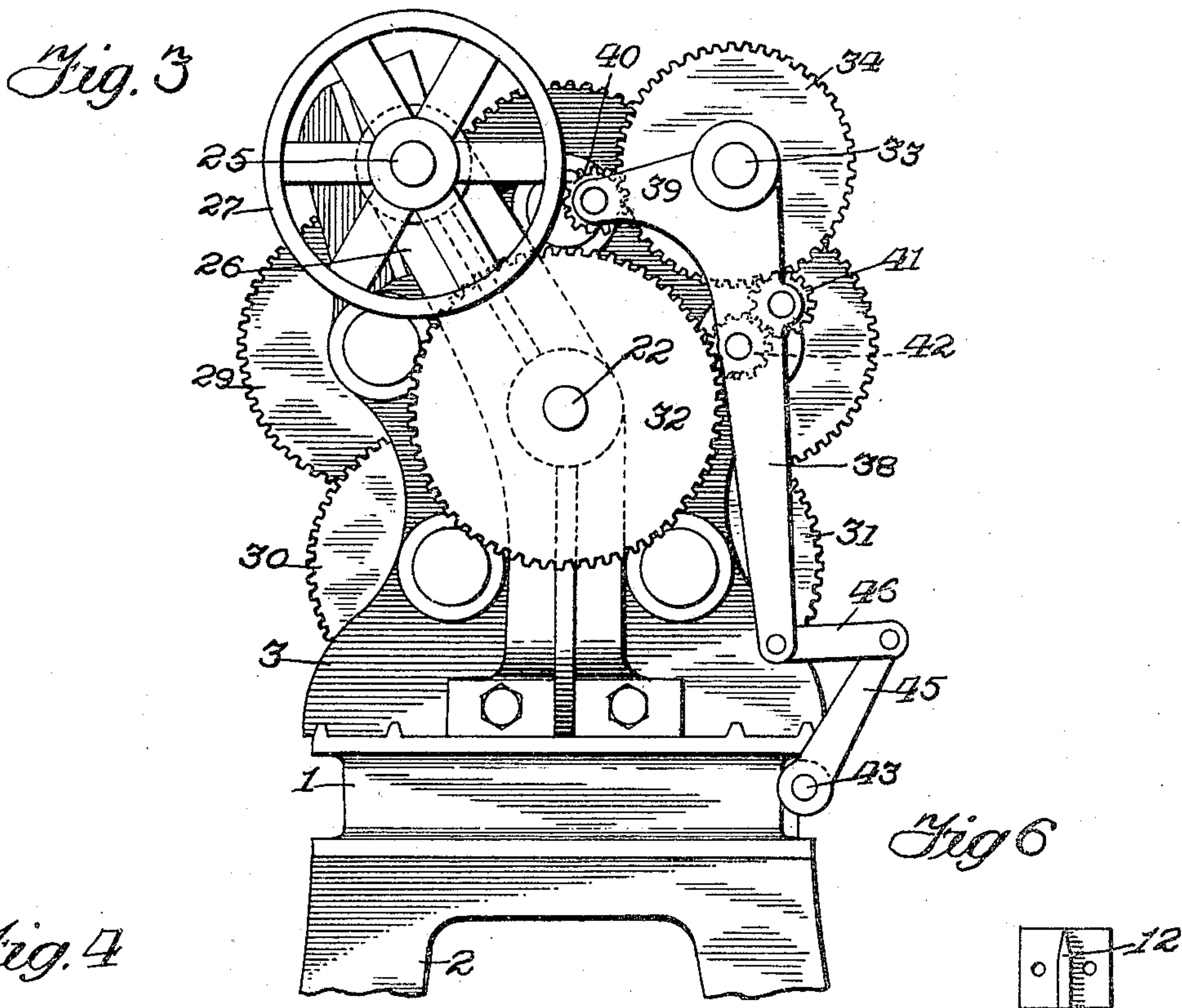
Witnesses:
Geo B Rowley
J. C. Katta

Inventor;
P. Krepp.
By J. B. Everett
Attorneys

P. KREPP.
LATHE.

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4 SHEETS—SHEET 3.



Witnesses:
Geo. B. Rowley.
E. E. Potter.

Inventor:
P. Krepp
By *N. C. Corbett*
Attorneys.

P. KREPP.

LATHE.

APPLICATION FILED OCT. 27, 1903.

4 SHEETS—SHEET 4.

Fig. 7

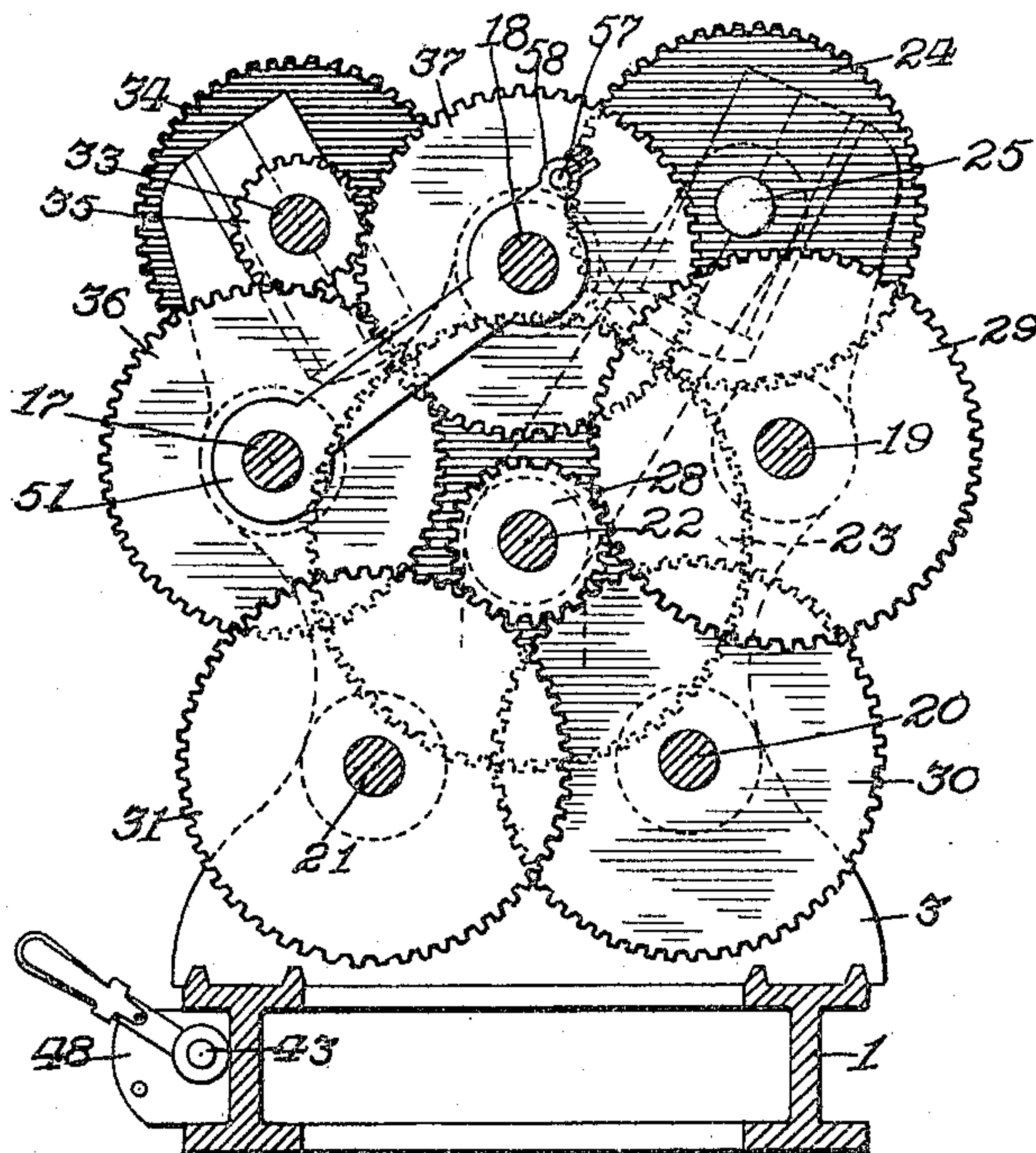


Fig. 8

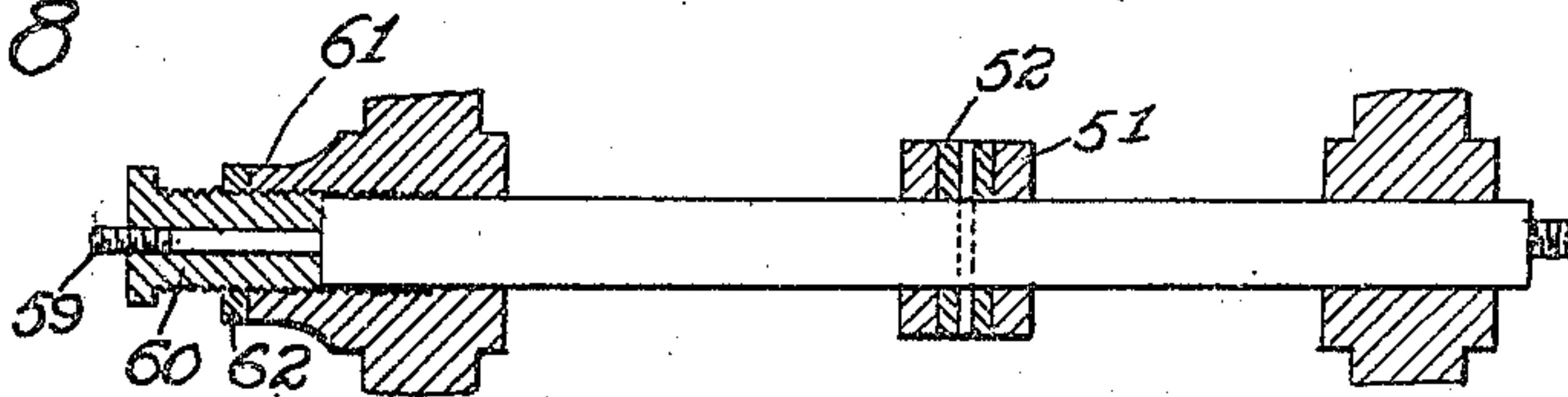


Fig. 9

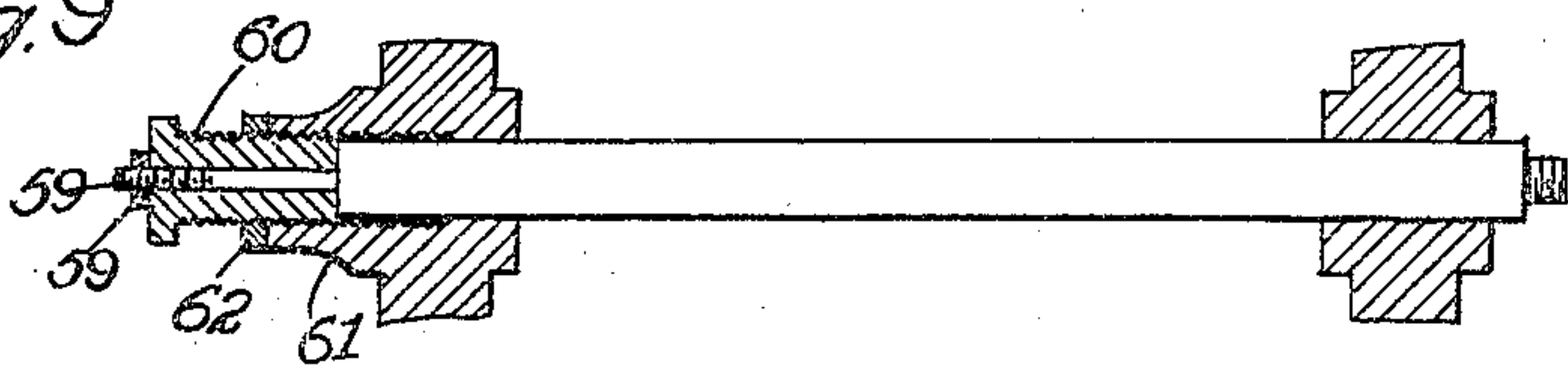
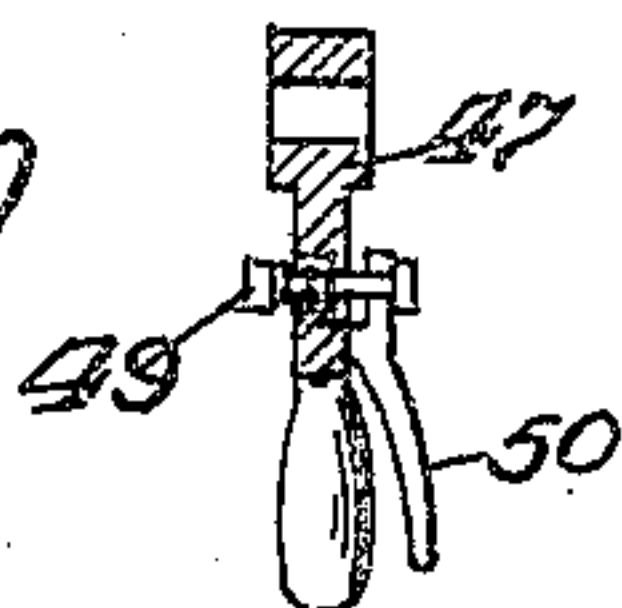


Fig. 10



Witnesses:

Geo. B. Rowley
E. E. Patten

Inventor:

P. Krepp

By *N. G. Overton*
Attorneys

UNITED STATES PATENT OFFICE.

PETER KREPP, OF PITTSBURG, PENNSYLVANIA.

LATHE.

SPECIFICATION forming part of Letters Patent No. 793,448, dated June 27, 1905.

Application filed October 27, 1903. Serial No. 178,737.

To all whom it may concern:

Be it known that I, PETER KREPP, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Lathes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in lathes, and relates more particularly to that class of lathes which are designed to be used when it is desired to perform a plurality of operations on a piece of work placed in the said lathe.

The object of this invention is to provide a lathe whereby a plurality of operations may be accomplished on one piece of work and also to provide means whereby a plurality of pieces of work may be simultaneously operated upon by a plurality of tools in the lathe.

A further object of this invention is to provide means whereby a piece of work within the lathe may be suitably tapped, if desired, and also to construct and arrange the different parts that one operator may control the entire mechanism.

With the above and other objects in view the invention consists in the novel construction, combination, and arrangement of parts to be hereinafter more fully described, and specifically pointed out in the claim.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a side elevation of my improved lathe. Fig. 2 is a plan view thereof. Fig. 3 is a rear end elevation. Fig. 4 is a detail elevation of the chucks in which the work is held. Fig. 5 is a detail of the locking mechanism for holding these chucks. Fig. 6 is a detail of the locking-wedge for the mechanism illustrated in Fig. 5. Fig. 7 is a sectional elevation taken on the line 7 7 of Fig. 1 looking in the direction of the arrow. Figs. 8 and 9 are details of the spindles upon which the tool-chucks are placed. Fig. 10 is a detail of the locking-handle used on the tap-reversing mechanism.

Briefly described, my invention consists in providing a plurality of chucks in which the work to be operated upon is placed, and I also provide a plurality of tool-holders, suitably mounted on spindles, the said spindles being in such relation to the chucks that all of the said tools may perform a different operation on all the pieces of work which may be held in the several chucks. The spindles upon which the tools are mounted are so geared as to be suitably driven from a common point, and means is also provided whereby one or more of the said spindles may be provided with a tap, and gearing is so arranged that the direction of rotation of the tap may be controlled. Means is also provided whereby the tap may be suitably fed forward. As it is imperative that the relation of the tools to the pieces of work held in the chucks should be relatively maintained when the different operations are being performed, a locking-disk is suitably connected with the said chucks whereby as the chucks are moved toward the tools the same will be held in the desired relative position.

Referring to the drawings, the reference-numeral 1 indicates the bed of the lathe, which is supported on any suitable legs or standards 2, and suitably secured to one end of the bed are uprights or standards 3 4, in which the several work-spindles are suitably journaled. At the other end of the lathe an upright 5 is suitably secured to the bed, and a stationary shaft or bearing 6, extending between the uprights 4 5, is suitably secured thereon. The disk 7, upon which the several chucks 8 are concentrically arranged, is rotatably mounted on this shaft 6, and secured to or formed integral with the sleeve 9 of said disk 7 is a locking-disk 10. This disk 10 is provided with notches 11, the number of which correspond with the number of chucks on the disk 7, and the notches are so arranged with relation to the chucks that when the said sleeve 9 is moved forward by means which will be hereinafter described one of the said notches 11 in the disk 10 is engaged by the locking-wedge 12. This wedge 12 is secured to the bridge member 14, said member being secured to the bed of the lathe by bolts 15, which pass through the plate 16, as clearly shown in Fig. 5.

As illustrated in the drawings, I have shown five chucks concentrically and evenly spaced around the center of the disk 7; but it is obvious that a greater or less number of chucks may be used, if desired; but when the said chucks number five, as shown, a corresponding number of tool-spindles will be similarly arranged and positioned, whereby as the chucks are moved toward the said spindles the tools held therein may act upon the work. The spindles 17, 18, 19, 20, and 21 are mounted in the uprights 3 4, as will be hereinafter described, and located centrally of the same is a shaft 22, upon which is secured a large gear 23. Meshing with this gear 23 is a main drive-gear 24, which is mounted upon the shaft 25, having bearings in the upright 3 and the upright 26, and secured on the outer end of said shaft is a suitable driving-pulley 27. Secured on the shaft 22, between the uprights 3 4, is an elongated gear 28, and mounted on the spindles 19, 20, and 21 are gears 29, 30, and 31, respectively, which mesh with the gear 28, thereby providing a means for rotating the said spindles. The shaft 22 is extended through the uprights 3 26, and secured to the end thereof is a gear 32. The shaft 33, journaled in the extensions of the uprights 3 4, has secured to its outer end a gear 34, which by means of intermediate gears, which will be hereinafter described, is adapted to be connected with gear 32, whereby the said shaft 33 may be driven, and secured to the said shaft 33, between the uprights 3 4, is an elongated gear 35, with which meshes the gears 36 37, mounted on the spindles 17 18. It will thus be seen that these spindles will also be suitably rotated.

Pivotaly suspended on the shaft 33 are two arms 38 and between the extensions 39 of which the gear 40 is mounted, this gear being so positioned that at all times it meshes with gear 34; but upon actuation of the said arms 38 the said gear is adapted to be connected or disconnected from the gear 37.

Mounted between the downwardly-extending portions of the arms 38 is a gear 41, which meshes with gear 42 and also with the gear 34, the gear 42 being adapted to be connected or disconnected from the gear 32 by the actuating of the said arms 38. It will be noted, however, that the gear 42 only engages with the gear 32 when the gear 40 is disengaged therefrom, and the gear 40 only engages gear 32 when the gear 42 is disengaged therefrom.

Extending longitudinally of the lathe, adjacent to the bed thereof, is a shaft 43, mounted in suitable bearings 44, and secured to the outer end thereof is a crank 45, which is connected to the arms 38 by a link 46, and to the other end of the shaft 43 a locking actuating-handle 47 is secured, and a locking-plate 48 is secured to the bed of the lathe. This handle 47 is provided with a spring-pressed latch

49, which is adapted to normally lie in one of the holes in the locking-disk 48; but the handle 50, pivotaly secured on handle 47, is adapted to disengage locking member 49 from said disk, whereby the shaft 43 may be rotated by the said handle until such time as the locking member falls into an opening in the locking-disk. By this means it will be noted that the direction of rotation of the shaft 33 may be readily reversed, for, as shown in Fig. 3 of the drawings, the gear 32, actuating the gear 34 through the medium of the gears 41 42, will rotate the shaft in one direction, whereas if the gear 42 is disengaged from gear 32 and the gear 40 connected with said gear 32 the shaft 33 will be rotated in the opposite direction. This changing of direction of rotation of the shaft provides a means whereby the direction of the rotation of the spindles 17 18 may be readily controlled. The reason for desiring to change the direction of rotation of the spindles 17 18 is that in many operations which might be performed on the machine it would be desirable to tap the work in one or more places, and it is obvious that when the tap has entered the work it would be necessary to reverse the same in order to withdraw it from the work, and in the case of the tapping-tools it would also be necessary to provide means whereby the said tap may be advanced toward the work, as they would probably have a much greater distance to advance than the tools which are being used of the remaining spindles, and to this end I provide a yoke member 51, the outer end of which is bifurcated and secured to the spindles 17 18 by any desired means, which as shown in Fig. 8 is a pin, and a collar 52, which is adapted to lie between the bifurcated ends of the said yoke member 51, and connected to this yoke member at its forward side is a link 53, which is also connected to the crank 54, secured on the actuating-shaft 55, mounted in suitable lugs on the upright 4 in such a manner that when the handle 56 is actuated the yoke member 51 may be advanced or retired, the said operation also carrying forward the spindles 17 18, with which the said yoke is connected, as has been described. A gage 57, adjustably mounted in extensions 58 of the yoke 51, is provided, whereby the advance of the yoke will carry the said gage with it, and when the end of the gage has reached the face of the upright 4 the operator will know that the tap has entered into the work the desired depth, whereby he will reverse the said tap by actuating handle 47. In order that the relative position of the face of the different tools may be suitably adjusted, the spindles are provided at their rear with an extension 59, the outer end of which is screw-threaded and projects through the threaded cap 60, which is mounted in extension 61 of the uprights 3, and a nut 59', secured on the outer end of the said extension 59, will hold

the rear face of the spindles against the inner face of the cap 60, whereby when the said cap is rotated in the extension 61 the said spindles will be advanced or retired, consequent upon which direction the cap 60 is rotated in, and a locking-nut 62 is provided on said cap for the purpose of securing the same in any desired position. Where certain of the spindles are being used for tapping purposes, as has been described, and the said spindles necessarily advanced or retired, as also described, the nut 59' is removed, whereby the said extension 59 may slide freely through cap 60, this construction being clearly brought out in Fig. 8, while Fig. 9 shows the nut in position. It is often the case in practice that only four of the spindles are necessary for the desired operations, and in this case spindle 17 is not brought into operative use, and thus the operator may remove the piece of work from the chuck which is opposite said spindle and insert a new piece of work therein while the remainder of the spindles are performing their respective operations.

It is of course necessary to provide means whereby the several chucks are fed toward the tools, and to this end the rear end of the sleeve 9 is provided with an annular slot 62, in which projections 63, which are secured in the bifurcated end of the actuating-lever 64, operate. This lever 64 is fulcrumed intermediate its length in a bracket 65, secured to the bed of the lathe, and the lower end of the lever 64 is provided with a slot 66, in which a pin 67, mounted in the crank 68, is adapted to operate. This crank 68 is secured on a shaft 69, which also has a bearing in the downwardly-extending portion of the bracket 65, and secured to the outer end thereof are the actuating-levers 70 71, the lever 70 of which has its end bent, as shown in Fig. 1, in order that the operator may place his foot thereon to feed the said chucks forward, thus leaving his hands free to actuate the other mechanism and insert and remove the work from the chucks. It will be noted by this arrangement, especially the arrangement of the crank 68, slot 66, and lever 64, that a great leverage is obtained, this being made necessary by the fact that all the pieces of work in the several chucks are being machined at once, where in the ordinary turret-lathe but one piece of work is being machined at a time.

The operation of my device would be as follows: The operator securing a rough piece of work in one of the chucks, the levers 70 71 are so actuated that the work is fed toward the first tool of the group, whereby the desired operation is performed on this piece of work. The chucks then being drawn back, another piece of work is inserted in the next chuck, and the chucks are then revolved to such position that the piece of work just in-

serted is acted upon by the first tool of the group while the piece of work first inserted is being acted upon by the second tool of the group. This operation is continued until the piece of work first inserted is located opposite the tapping-tool, at which time the operator so actuates the handle 47 that the said tap will be revolved in the desired direction, and by thus advancing the chucks toward the tools and actuating-handle 56 the tap is caused to tap the work. When the tap has been fed into the work the desired distance, the handle 47 is actuated, whereby the direction of rotation of the tap is reversed, whereby it will free itself, and the chucks may then be retired from the tools and the several operations performed, it of course being necessary to remove the piece of work when the operations upon the same have been completed and insert a rough piece of work in the chuck from which the piece of work has been removed. It will of course be obvious that a die, chaser, or other desired tool could be suitably operated on the spindles 17 18 instead of a tap, as described.

While I have herein shown and described my invention in detail, it is obvious that many changes in the method of gearing, arrangement of parts, number of tools, &c., may be made without departing from the general spirit of my invention.

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

In a lathe, the combination with the bed thereof, of suitable stationary uprights mounted thereon, a shaft rotatably mounted in said uprights, a plurality of work-spindles rotatably mounted in said uprights concentrically to said shaft, tools suitably secured to the ends of said spindles, a gear on said shaft, gears on a portion of the spindles meshing with the gear of the shaft whereby said spindles may be rotated, means for rotating said shaft, a shaft mounted in said uprights outside the radius of the work-spindles, a gear mounted on said shaft, gears mounted on the remainder of the spindles and meshing with said gear whereby the same may be rotated, connections between said shaft and said centrally-disposed shaft whereby the direction of rotation of the shaft outside the radius of the spindles may be reversed, thereby reversing the direction of rotation of the spindles geared thereto, means connected with the last-named spindles whereby the same may be longitudinally actuated variable distances, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

PETER KREPP.

Witnesses:

A. M. WILSON,
E. E. POTTER.