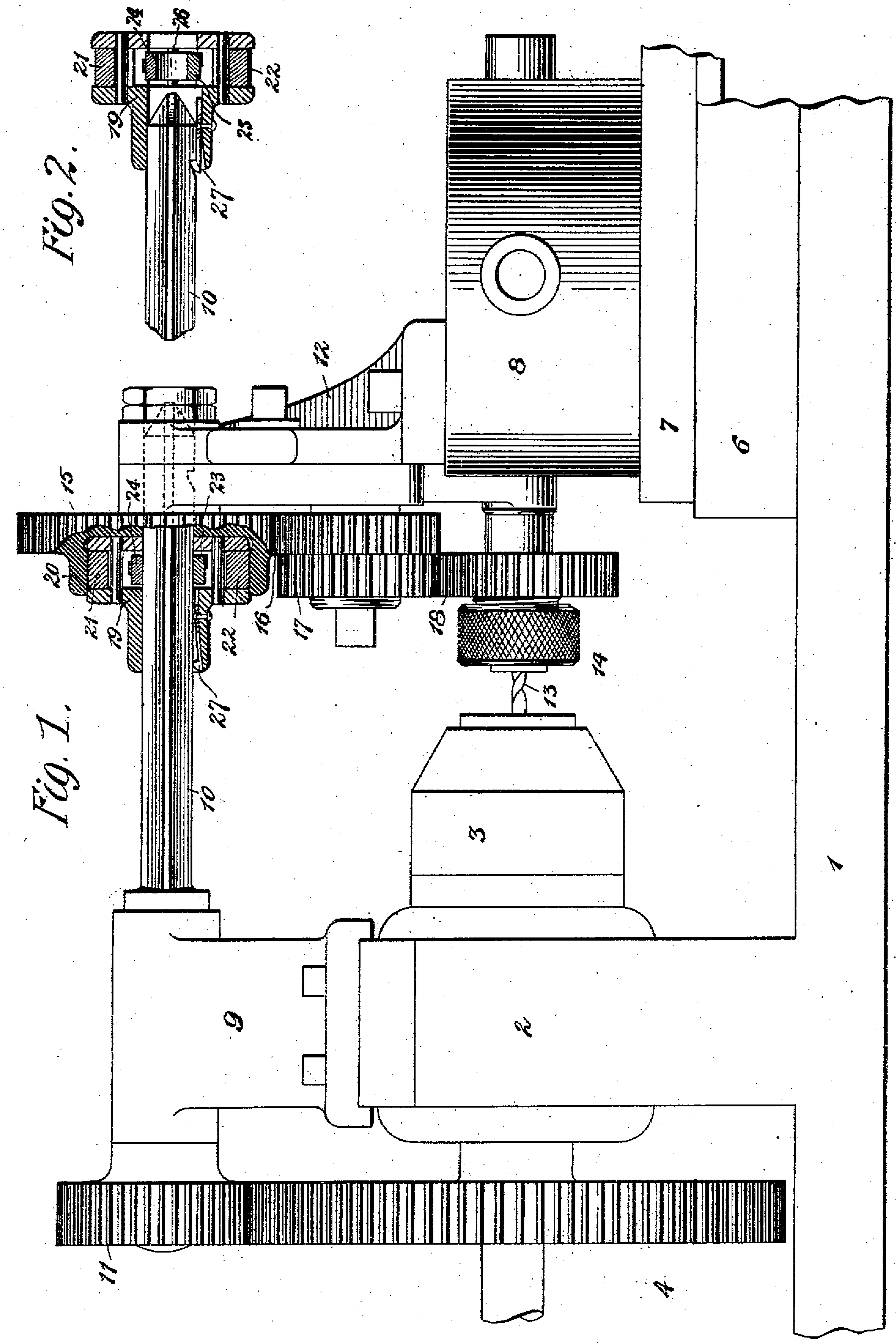
No. 740,641. PATENTED OCT. 6, 1903.

C. GLOVER.

LATHE.

APPLICATION FILED MAR. 23, 1903.

NO MODEL. 3 SHEETS—SHEET 1.



Witnesses

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By his Attorney

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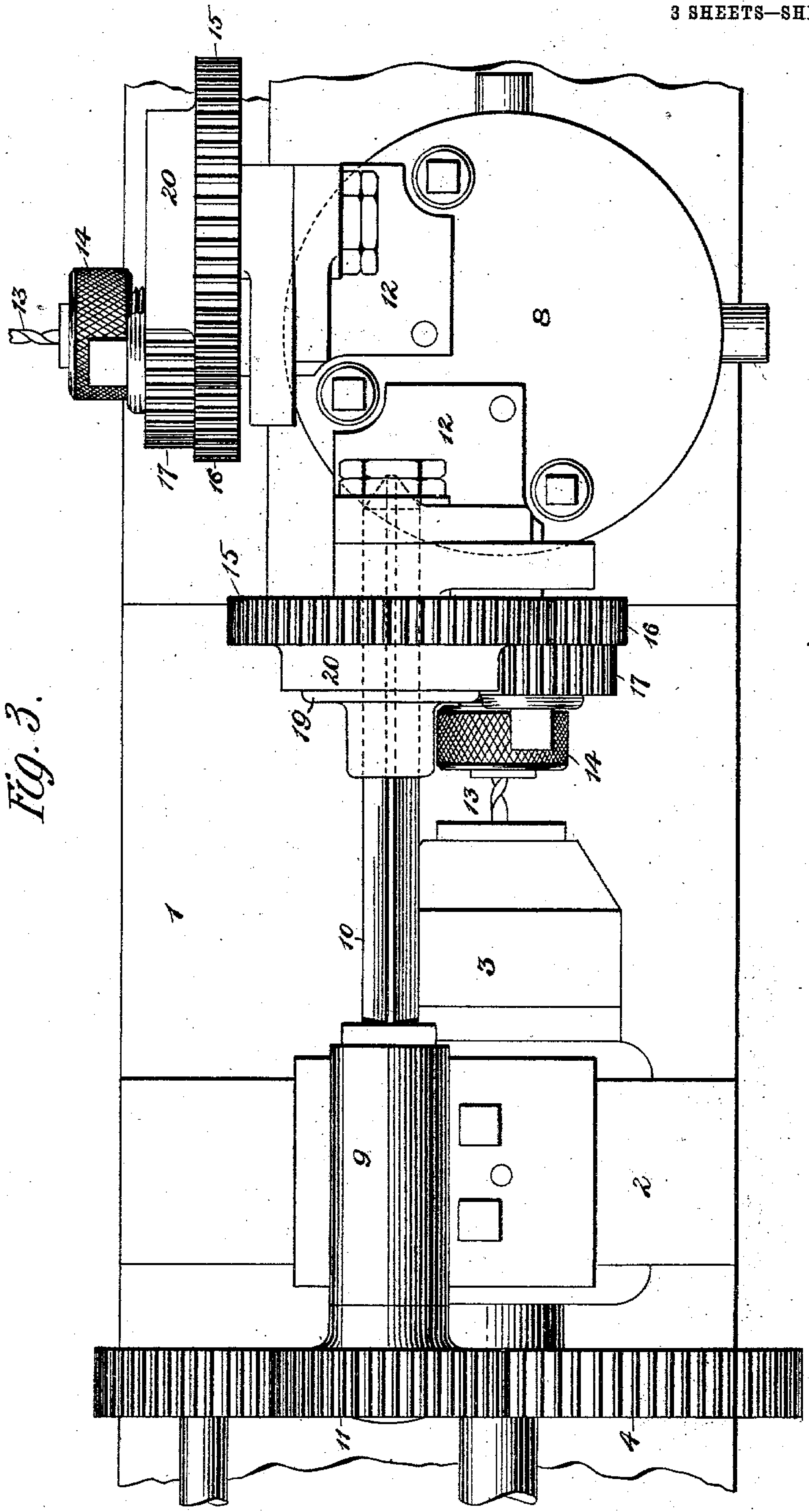
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 3.



Witnesses

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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 5.

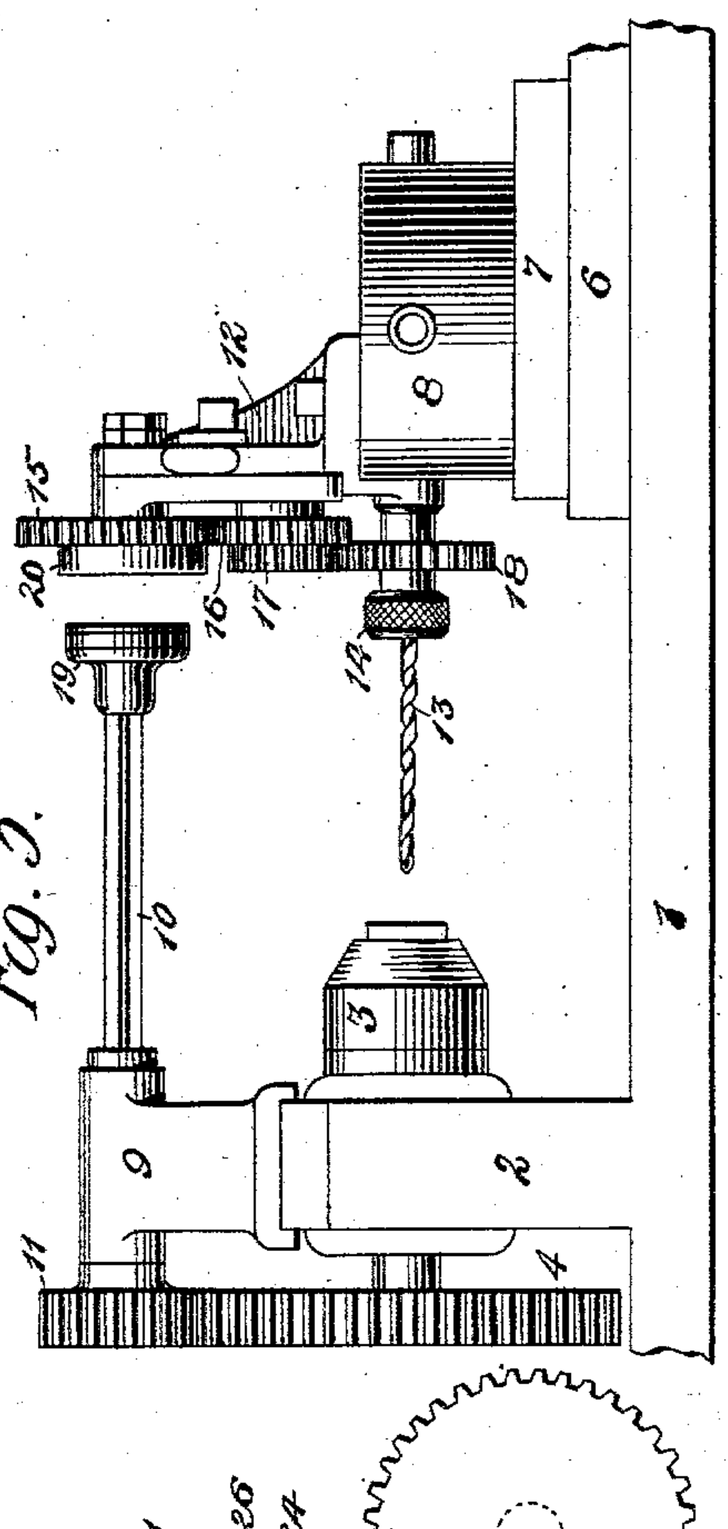


Fig. 7.

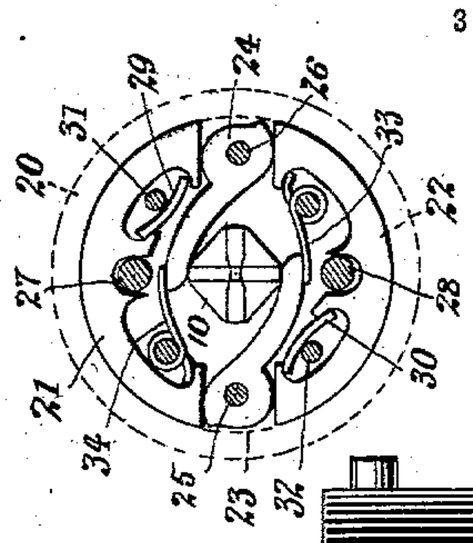


Fig. 6.

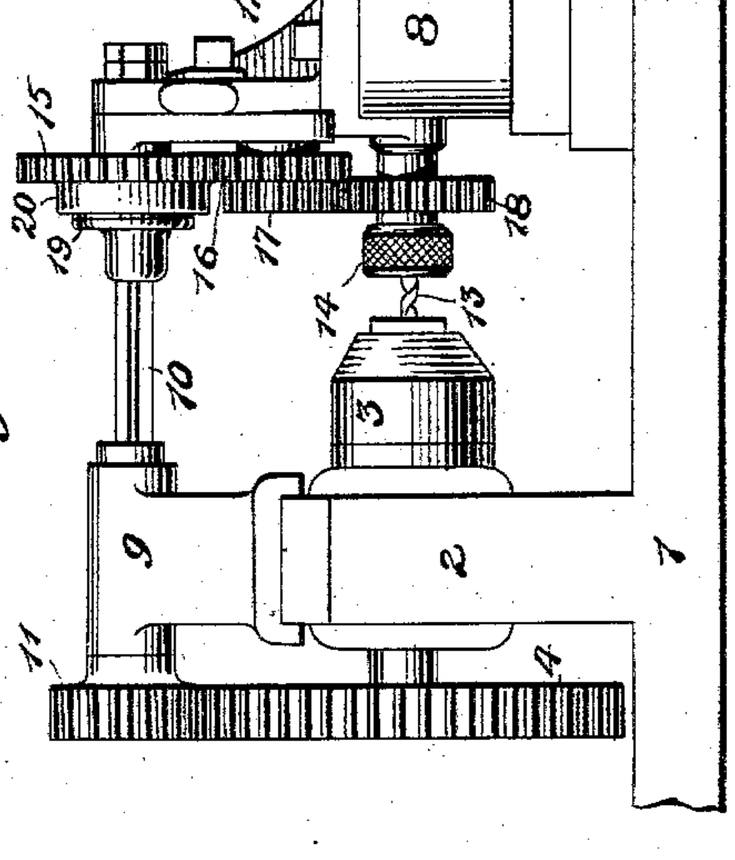
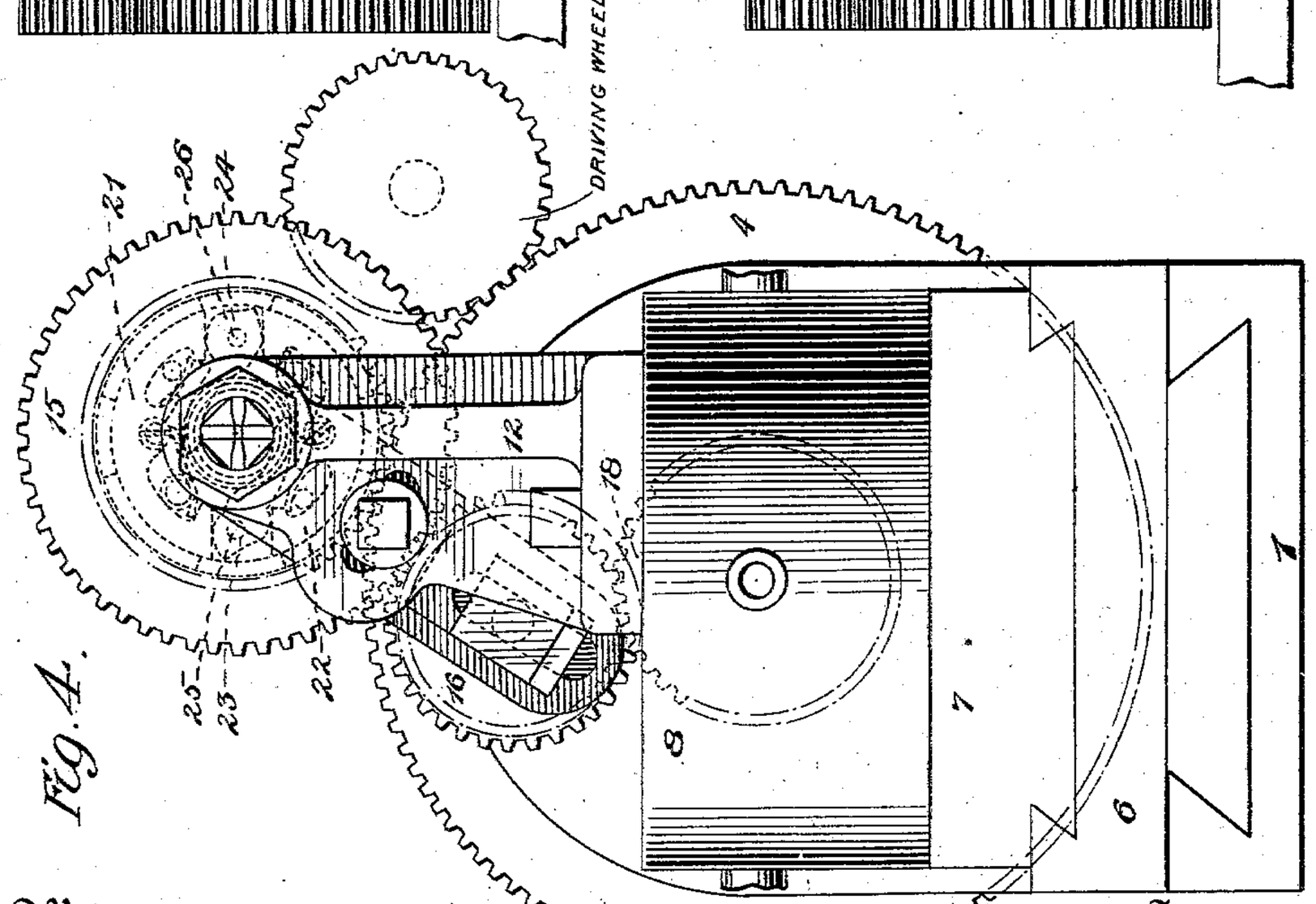


Fig. 4.



Witnesses
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No. 740,641. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

CHARLES GLOVER, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE CORBIN SCREW CORPORATION, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

LATHE.

SPECIFICATION forming part of Letters Patent No. 740,641, dated October 6, 1903.

Application filed March 23, 1903. Serial No. 149,106. (No model.)

To all whom it may concern:

Be it known that I, CHARLES GLOVER, a citizen of the United States, residing at New Britain, in the county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Lathes, of which the following is a full, clear, and exact description.

My invention relates to lathes, and particularly to that class of lathes called "turret-lathes."

The object of this invention is to provide a simple and effective drilling or milling attachment which may be secured to the turret-head of a lathe, so that when it is desired to drill or mill the work carried by the spindle it is merely necessary to swing the turret-head into such position that the revoluble tool faces the work and to then move the turret toward the work. The means for revolving the tool is automatically coupled with the source of power so long as the tool is being operated and uncoupled therefrom when that particular operation is completed. From this it will be seen that the drilling or milling mechanism is disconnected from the source of power when the other tools carried by the turret are being used. Hence undue wear of the parts and waste of energy are avoided.

Figure 1 is a front elevation, partly in section, of those portions of a lathe involving my invention. Fig. 2 is a longitudinal section of the clutch mechanism. Fig. 3 is a plan view of the parts shown in Fig. 1 and with a second drilling attachment provided upon the turret. Fig. 4 is an end elevation looking toward the turret end. Fig. 5 is a front elevation showing the drilling attachment facing the work, but uncoupled. Fig. 6 is a similar view showing the drill at work and coupled with the source of power. Fig. 7 is a detail view of the clutch mechanism with the end plate removed.

1 is the main bed or frame of the lathe. 2 is a head providing bearings for a spindle 3. 4 is one of the ordinary back-gears by means of which the spindle 3 is driven. 6 is a portion of a longitudinally-adjustable carriage supported by the bed 1. 7 is a longitudinally-movable slide supported by the carriage 6, and 8 is a turret carried by the slide 7. All of these parts may be constructed in the usual manner common to machines of this character, with proper provision for adjusting the carriage-slide of the turret and for moving the same in the ordinary way.

9 is a journal-block, which may be mounted upon the head 2 and which provides a bearing for an auxiliary shaft 10, which I shall term herein the "clutch-shaft."

11 is a gear on shaft 10, meshing with one of the back-gears 4 and by means of which the shaft 10 may be rotated from the source of power. In the usual operation of this machine this shaft 10 rotates continuously, and the means shown is one convenient means for transmitting the power from the source to the clutch-shaft.

12 is a bracket which may be detachably secured to the turret 8 and carries the parts of a drilling attachment.

13 is a drill carried by a chuck 14, which is suitably mounted in the frame 12 or an extension thereof. The gears 15, 16, 17, and 18 are mounted upon suitable bearings on the bracket 12. The chuck 14 is secured to rotate with the gear 18.

19 is a clutch carried at the end of the shaft 10 and adapted to rotate therewith.

20 is a clutch-drum which is carried by the gear 15.

21 and 22 are clutch-shoes which are mounted in the clutch 19 and adapted to have movement diametrically outward to engage with the inner surface of the clutch-drum 20 at the desired moment.

23 and 24 are cams which are mounted between the adjacent ends of the clutch-shoes 21 and 22. When these cams are actuated by rotating them slightly about their axes 25 26, they move said clutch-shoes outwardly. A lever-arm may extend from each of the cams 23 24, and these lever-arms project into the path of the end of the shaft 10. The clutch, as shown, is slidable upon the shaft 10, and the said shaft may be squared or keyed and the clutch properly fitted thereon, so that while it may slide thereon it must rotate therewith. The end of the shaft 10 may be tapered or pointed, as shown in Fig. 2. A

latch 27 may be provided, carried by one of the parts—for example, the clutch member adapted to engage the other member (the shaft 10) when the shaft has been retracted. The function of the latch is to prevent the clutch from being withdrawn from the shaft entirely.

From the foregoing description it will be seen that the apparatus will operate as follows: Referring particularly to Fig. 5, in this figure the turret has been swung so that the drill 13 faces the work. In this position the clutch-drum 20 faces the clutch member 19, carried by the shaft 10. When in the operation of the machine the turret is moved toward the work, the clutch 19 abuts against the bottom of the clutch-drum 20, and a further movement causes it to slide onto the shaft. As soon as the end of the shaft encounters the cam-levers the same are thrown outwardly and the cams act to expand the clutch-shoes, so as to engage tightly with the inner wall of the drum, whereupon the several gears 15, 16, 17, and 18 are then set in motion from the source of power, thus giving motion to the drill, which may then be brought up against the work, which may be drilled as deeply as the particular operation requires.

It should be understood that the gear ratios may be such that, although the spindle 3, which carries the work, is revolving at a certain speed, the speed at which the drill is rotated may be so much in excess that it will drill a hole in the work carried by the spindle just as effectively as though the work were stationary. The direction of rotation of the drill is quite immaterial to the invention, a suitable drill, of course, being used, so that the cutting-face will act properly in performing its function. When the drilling operation is completed, the turret is slid back until the cam-levers are freed from the shaft 10, whereupon the clutch is released, so that by sliding the turret back still farther it may be entirely freed from the clutch and swung around to bring any other tool into the operative position relatively to the work carried by the spindle 3. By changing the ratio of the gears any speed of the drill may be had.

From the foregoing it will be seen that the usual turret-tools may be carried and thrown into the operative position, and in addition thereto a drilling attachment may be carried by the turret, so that without taking down the work or in any way substantially interrupting the process the drilling operation may be resorted to with the same facility as any other operation such as commonly effected with turret-lathes. Any number of these drilling attachments may be used corresponding to the usual turret positions.

While it should be understood that any suitable form of clutch mechanism may be employed to connect the shaft 10 with the gears which drive the drill 13, one convenient form of clutch mechanism is shown in the drawings, and, referring particularly to Fig. 7, the same will be found to comprise the aforesaid clutch-shoes 21 22, which have the diametrically outward movement, and the cams 23 24, pivoted at 25 26, respectively, and located between the ends of the shoes 21 22. This view also shows the lever-arms, which are pushed apart by the shaft 10 to throw the cams into operative position and spread the clutch-shoes 21 22 into firm engagement with the interior of the clutch-ring or drum 20. In this view it will be seen that pins 27 28 are provided carried by the main portion of the clutch 19, the function of said pins being to prevent shoes 21 22 from shifting around, so as to bind on the cams and cause them in turn to bind onto their pivots. 29 30 are springs held in suitable cavities in the clutch-shoes 21 22, the said springs being respectively engaged by other stationary pins 31 32, secured in the main body of the clutch member. By the presence of these springs the clutch-shoes 21 22 are normally retracted and prevented from becoming accidentally disengaged from the clutch. 33 34 are springs suitably held in such manner that the ends of the same bear against the lever extensions of cams 23 24, so as to press said levers against the shaft 10 and release the clutch when the shaft 10 is withdrawn from between the lever-arms.

From the foregoing description it will be seen that my invention provides a means whereby an article carried by the work-holder and upon which the work is to be performed may be bored and counterbored, if desired, without the necessity of removing it from said holder. Ordinarily in devices of this kind the turret-head is provided with outside cutting or milling tools and the spindle carrying the work is arranged to run rather slowly—in fact, too slowly to facilitate drilling. For this reason and because a drill should run at a relatively much higher speed I have devised the attachments described herein, which may be readily attached to any turret-head and brought into play whenever it is desired to drill the work. At other times the drilling attachment is idle and will absorb none of the power employed for driving the machine.

What I claim is—

1. In a machine of the class described, the combination with a work-driving spindle and a rotatable turret mounted to move toward and from said spindle, of a bracket carried by the turret and in turn carrying a rotatable tool-spindle, a shaft mounted adjacent to and arranged to be driven with said work-driving spindle, but whose axial position is independent of the position of said work-driving spindle, and means connected to said tool-spindle, and arranged to be engaged by said shaft to rotate the tool-spindle when the turret brings the same into operative position.

2. In a machine of the class described, the combination with a work-driving spindle, and a rotatable turret mounted to slide toward

and from said spindle, of a rotatable tool-spindle carried by said turret, a shaft adjacent to and arranged to be driven with said work-driving spindle and means connected with said tool-spindle and said shaft and arranged to couple said shaft with said tool-spindle to rotate the latter when the turret brings the same into operative position, said means including an automatically-operated clutch.

3. In a machine of the class described, the combination with a work-driving spindle, of a rotatable turret arranged to move toward and from said spindle, of a rotatable tool-spindle carried by the turret, a shaft having a fixed axis of rotation mounted adjacent to and arranged to be driven by said work-driving spindle, and means to engage said tool-spindle with said shaft to rotate said tool-spindle when the turret brings the latter into operative position.

4. A lathe including a work-driving spindle, a counter-shaft driven therewith, a turret mounted to move toward and from the spindle, a tool-carrying spindle carried by the turret, a series of gears connected to said latter spindle, one of said gears having a recess therein, a longitudinally-movable clutch rotatable with said counter-shaft and adapted to engage with the wall of said recess.

5. A lathe including a work-driving spindle, a counter-shaft driven therewith, a turret mounted to move toward and from the spindle, a tool-carrying spindle carried by the turret, a series of gears connected to said latter spindle, one of said gears having a recess therein, a longitudinally-movable clutch rotatable with said counter-shaft and adapted to engage with the wall of said recess, and a catch carried by the clutch for engaging the shaft to prevent accidental removal of the clutch from the shaft.

6. A lathe including a work-driving spindle, a rotatable counter-shaft, a turret mounted to have longitudinal movement relative to the work-driving spindle, a tool-carrying spindle carried by the turret, a clutch carried by said counter-shaft and adapted to rotate therewith but to have a longitudinal movement thereon, said clutch comprising brake-shoes, operating-cams therefor having members adapted to coöperate with the counter-shaft as the clutch is moved longitudinally thereon for expanding the brake-shoes, said clutch being adapted to couple the tool-carrying spindle with the counter-shaft when the turret is moved toward the work-driving spindle.

7. A lathe including a work-driving spindle, a tool-slide mounted to move toward and from the work-spindle, a rotary tool-spindle carried on said slide, a shaft driven with said work-spindle, a clutch slidably carried thereby, said shaft being arranged to automatically operate said clutch to connect or disconnect said tool and work-spindle.

8. A lathe including a work-driving spindle, a rotatable turret mounted to move toward and from said work-driving spindle, a tool-carrying spindle carried by said turret, a train of gears connected to said tool-carrying spindle and carried by said turret, and clutch mechanism comprising a member in operative connection with the work-driving spindle but having an axis of rotation eccentric of the axis of rotation of said work-driving spindle and a second member in operative connection with the train of gears, said second member being adapted to coöperate with the first member and to be rotated thereby when the turret is moved toward the work-driving spindle and to be released therefrom when the turret is moved in the opposite direction.

Signed at New Britain, Connecticut, this 20th day of March, 1903.

CHARLES GLOVER.

Witnesses:
H. B. POST,
M. C. JOHNSON.