

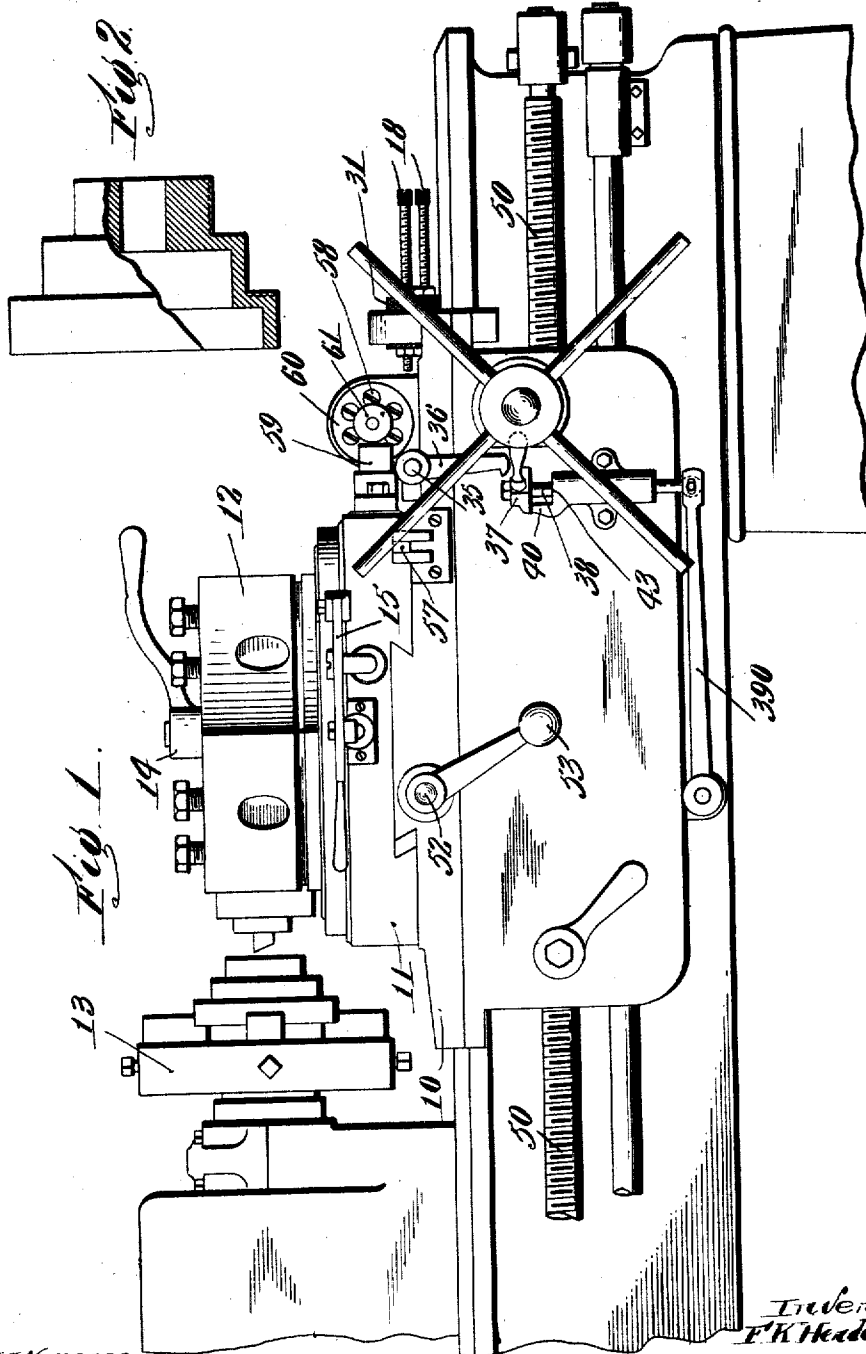
F. K. HENDRICKSON.
TURRET LATHE.

APPLICATION FILED JUNE 2, 1908.

Patented Jan. 11, 1910.

4 SHEETS—SHEET 1.

945,947.



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APPLICATION FILED JUNE 2, 1908.

4 SHEETS—SHEET 2.

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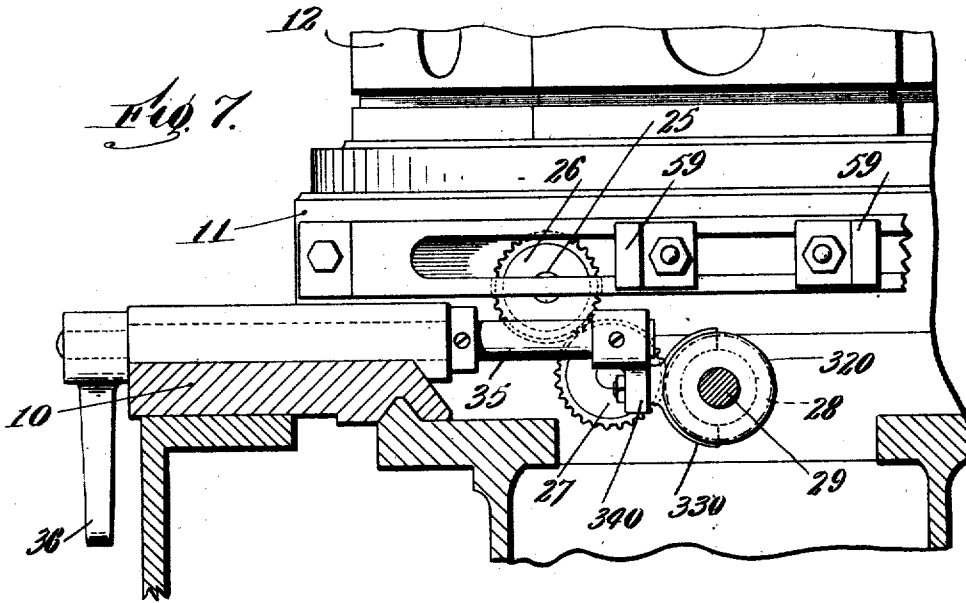
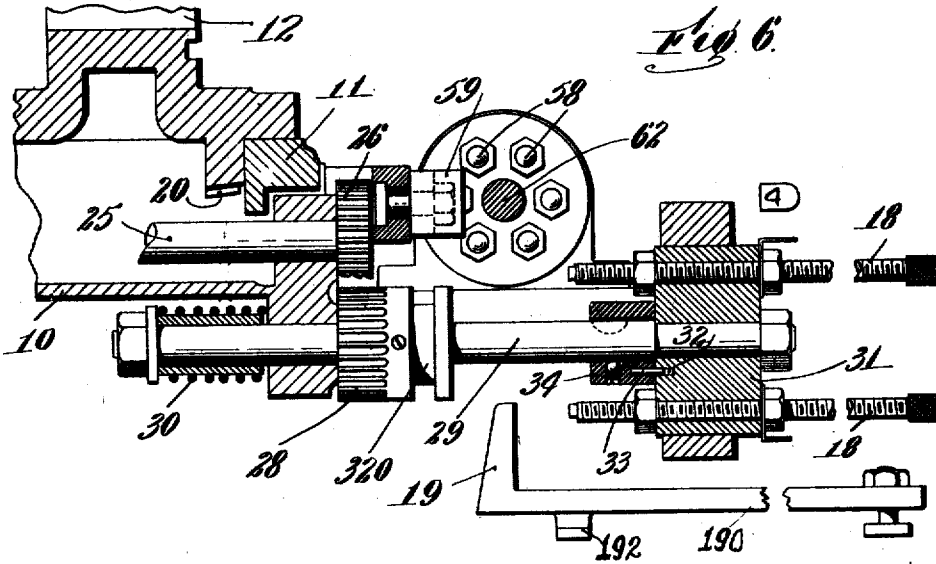
TURRET LATHE.

APPLICATION FILED JUNE 2, 1906.

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4 SHEETS—SHEET 3.

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Witnesses:

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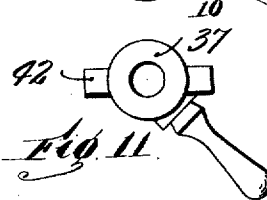
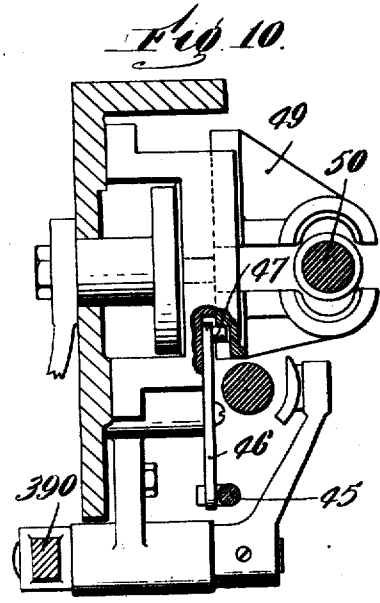
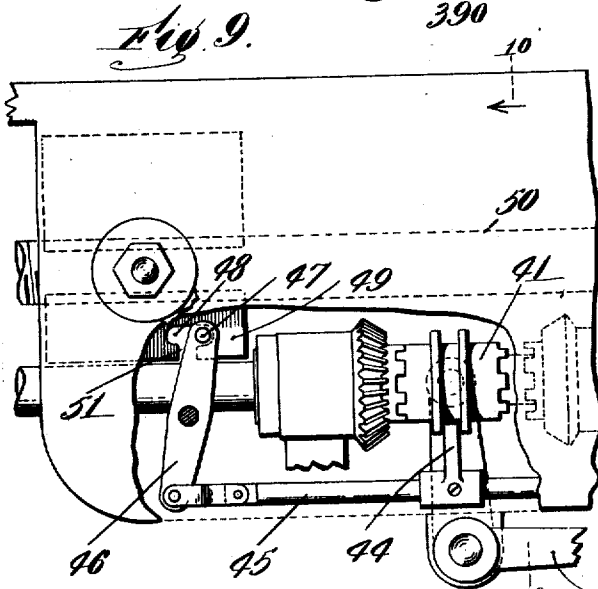
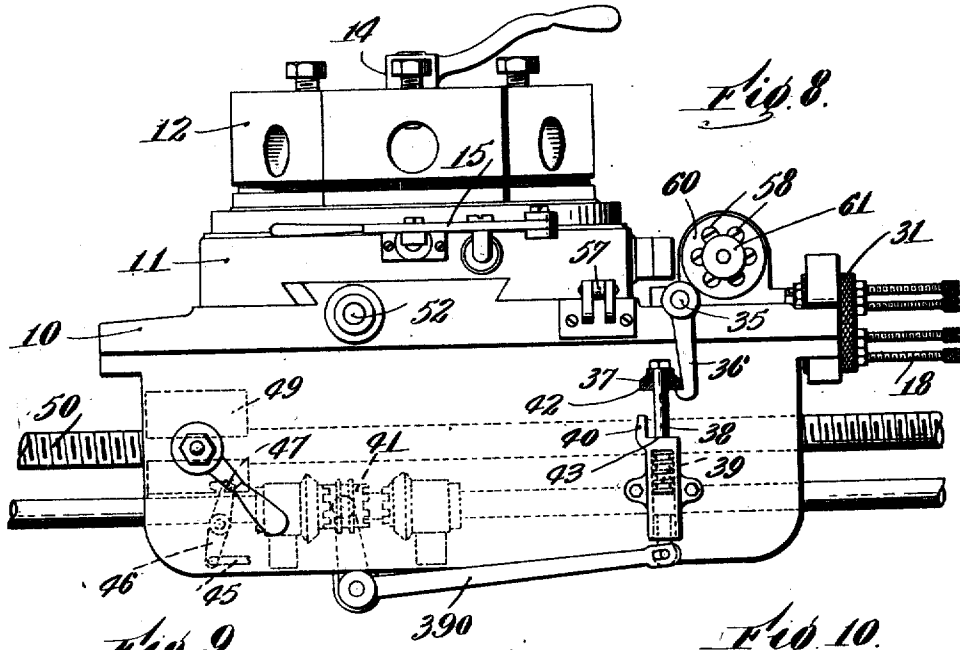
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TURRET LATHE.
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4 SHEETS—SHEET 4.

945,947.



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UNITED STATES PATENT OFFICE.

FRED K. HENDRICKSON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO PRENTICE BROTHERS COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

TURRET-LATHE.

945,947.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed June 2, 1906. Serial No. 319,832.

To all whom it may concern:

Be it known that I, FRED K. HENDRICKSON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Turret-Lathe, of which the following is a specification.

My invention relates to improvements in turret lathes.

The principal objects of the invention are to provide an improved means for regulating the lateral traverse stops connected with the turret and operated thereby; to provide means whereby the traverse stops can be operated by hand independently of the position of the turret when it is desired to use the same tool for cutting several surfaces; to provide for automatically stopping the feed when a stop screw comes into contact with its stop; to provide an improved connection for the stop motion latch whereby the feed can be stopped or reversed automatically in a very simple manner; to provide for automatically locking the ordinary clutch member used on the feed in central position, when the open-and-shut nut is closed to connect the carriage with the feed-screw for cutting screw-threads; and to generally improve the construction of lathes of this character in several other particulars as will appear below.

Reference is to be had to the accompanying drawings which illustrate a preferred embodiment of my invention and in which,

Figure 1 is a side elevation of a turret lathe with certain features of my invention applied thereto. Fig. 2 is an elevation of a cone pulley partly in section to show the work of the machine. Fig. 3 is a plan of the turret, slide and carriage. Fig. 4 is a sectional view of the same on a line 4-4 of Fig. 3. Fig. 5 is an end elevation of a centering stop which I preferably employ. Fig. 6 is a sectional view similar to a portion of Fig. 4 and on an enlarged scale. Fig. 7 is an end elevation of a portion of the device. Fig. 8 is a side elevation. Fig. 9 is a portion of a side elevation similar to Fig. 8 on an enlarged scale with parts broken away to show interior construction. Fig. 10 is a sectional view on the line 10-10 of Fig. 9, and Fig. 11 is a plan of a latch-dog shown in Fig. 8.

I have shown my invention as applied to

a turret lathe of a well-known type having on the lathe bed a carriage 10 adapted to move longitudinally, a slide 11 on the carriage moving transversely, and a turret 12 on the slide. The turret is as usual, provided with means for holding a plurality of tools and is adapted to be turned on a pivot to present any desired tool to cutting position for operation. In the present instance, I have shown the chuck 13, with which lathes of this character are usually provided, as holding work in the form of a cone pulley and in Fig. 2 I have illustrated this pulley to show the cross and lateral cuts which can be obtained with the lathe. The turret is as usual, provided with a tightening nut 14 and a lock lever 15, the lock lever being mounted on the cross slide and having a locking pin 16 and spring 17.

The turret is intended to be turned by hand to bring the proper tool into position for operation and in order that the machine may stop automatically, to provide for the proper operation of each tool, a series of adjustable screw stops 18 are provided. These are known as the lateral traverse stops. Each corresponds to one of the tools of the turret and they are adjusted in a well-known manner to provide for the proper traverse for each tool which they regulate in conjunction with a stop 19. This stop has a body 190 which is adjustable along a groove 191 on the inside of the base. The stop 19 has a guide 192 in the groove and is secured in adjusted position by a clamping nut 193. In order to turn these stops as the turret is turned and always have the right stop in position to operate in conjunction with the proper tool, the following mechanism is provided:

On the bottom of the turret is a circular gear 20 constantly meshing with a bevel gear 21 splined and slidable on a shaft 22 which is mounted in fixed bearings on the carriage 10. This shaft carries a second bevel gear 23 meshing with a bevel gear 24 on a shaft 25 which carries a gear or pinion 26. This gear through a gear 27, drives a gear 28 fixed to a rod 29. This rod is mounted in bearings on the carriage and is adapted to have a slight longitudinal motion on the carriage, being normally held in one extreme position by a spring 30.

In a screw stop holding member 31 which

is longitudinally movable on the carriage, is a cavity 32 in which is adapted to rest a pin 33 on a lock collar 34. This lock collar is mounted to reciprocate on the rod 29 and when it is desired to turn the lateral traverse rods by hand for cutting several surfaces with the same tool, this lock collar is moved to the left to disengage the pin 33 from the cavity 32 and permit the stop holding member to be turned independently of the rod 29; this also permits the rod to be turned independently of the stop holding member. As there is only one cavity 32 for the pin to enter, when the locking collar is again in position for the pin to be in the cavity, it will bring the right stop screw in position for engaging the stop 19 to correspond with the proper tool in the turret. Each lateral stop screw is preferably numbered to correspond with one of the tool holders on the turret.

When the machine is in operation, if a certain stop screw 18 comes up against the stop 19, the travel of the rod 29 is arrested, but the carriage still moves a short distance, the spring 30 yielding to allow this motion to take place independently of the rod 29. The relative motion between the carriage and the rod 29 is employed for operating my automatic feed stopping device which I will now describe. On the rod 29 is a spool 320. Engaging this spool is a member 330 secured to an arm 340 on a shaft 35. This shaft carries a stop motion latch 36. It will be seen that when there is a relative motion between the rod 29 and the carriage which supports the bearings for the shaft 35, the spool will cause the shaft to be turned slightly and permit the stop motion latch, which is normally in position shown in Fig. 8 under a latch-dog 37, to be swung outwardly and disengaged from the latch-dog. The latch-dog is mounted on a rod 38 which is provided with a spring 39 for normally pulling it down and when the latch is disengaged from the latch-dog, the latter will be pulled down on a projection 40, the upper surface of which is in such position as to hold the rod 38 in a central position and through the instrumentality of a bell-crank 390, to bring the ordinary clutch member 41 into central position so that the feed will be stopped.

It will be noticed that the latch-dog, as shown in Fig. 11, is provided with a projection 42 which is the portion of the latch-dog that really engages the projection 40. When it is desired to reverse the feed, this projection is turned out of the path of the projection 40 and the spring 39 then forces the latch-dog onto a seat 43 in which position the clutch member will so move as to reverse the feed.

In order to keep the clutch member 41 in central inoperative position when screw-

threads are to be cut, I have shown the collar thereon as being engaged by a yoke or the like 44 mounted on a sliding rod 45. This rod is operated by a lever 46 pivoted on the apron of the lathe, the lever being provided with a pin 47 projecting into a T-slot 48 in the open-and-shut nut 49. The head of the slot 48 is long enough to permit the clutch member 41 to move back and forth for reversing and all the motions that it is intended to have. When, however, the open-and-shut nut is closed on the feed screw 50 so as to set the lathe for cutting screw-threads, the lower part of the nut in which is the slot 48, moves upwardly to such an extent that the pin 47 is turned out of the head of the slot 48 and into the narrow shank 51 of the slot. This keeps the clutch member in central inoperative position while the machine is set for cutting screw-threads. The cross-slide is moved across the carriage either by hand or automatically through the use of a rod 52 threaded in a nut on the slide. The rod is provided with a handle 53 for hand operation. For automatic operation, a gear carrying member 54 is loosely journaled on this rod and is operated by a train of gears in the usual manner. Under ordinary circumstances, this member is loose and may be tightened so as to operate the rod by a friction ring 55 secured to the rod. This friction ring can be tightened up against the gear carrying member by means of nuts 56 or in any other equivalent manner. On the carriage is pivotally mounted a centering stop 57, its end being adapted to engage the slide to stop it and therefore the turret, in central position. Cross traverse stop screws 58 are employed, similar to the screws 18 for engaging stops 59. These stop screws are turned by hand, those at one side by a thumb nut 60 and those at the other by a thumb nut 61 operating a rod 62.

It is, of course, understood that certain parts of the invention represented herein can be applied to lathes of other types than the one represented in the drawings and that the invention is therefore not limited to this particular type of lathes. I am also aware that the objects of this invention can be carried out with numerous modifications and that any person skilled in the art can make many changes in the form of construction shown without departing from the scope of my invention as represented in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters-Patent is:—

1. In a turret lathe, the combination of a turret, a rod rotatable thereby, a holding member rotatably mounted on said rod, adjustable stops mounted on said holding member, a stop for engaging said adjustable stops, a lock collar keyed to and slidable on said rod, said lock member having a pin and

said holding member having a cavity for the reception of said pin.

2. In a turret lathe, the combination of a turret, a rod operated thereby, a stop holding member rotatably mounted on said rod, adjustable stops on said stop-holding member, a stop for engaging said adjustable stops, and a locking device on said rod for retaining said holding member in a certain position on the rod with respect to the position of the turret, said locking device being movable to a position in which the holding member can be turned independently of the rod.

3. In a turret lathe, the combination of a turret, a rod operable thereby in proportion to the amount of rotation of the turret, a stop holding member mounted on said rod and rotatable thereon, adjustable stops on said stop holding member, a stop for engaging said adjustable stops and means for positively connecting said stop holding member with the rod in one angular position thereof and for disconnecting the stop holding member from the rod when said member is out of said position.

4. In a lathe, the combination of a reversing device, a clutch member therefor, a reciprocable rod connected with the clutch member for controlling the position thereof, means for normally forcing said rod in a certain direction, a latch-dog on the rod, a stop motion latch adapted to engage the dog and hold the rod in a certain position, and means constructed and adapted to stop the dog when the latch is released therefrom in an intermediate position to stop the feed.

5. In a lathe, the combination of a clutch for controlling the feed, a movable rod connected with the clutch for operating it, a spring for urging the rod in a certain direction, a latch-dog on said rod, a seat for said latch-dog in position to engage the latch-dog and hold it in position for reversing, said seat having means for holding the latch dog in position for stopping the feed and means

for normally holding the latch-dog away from said seat.

6. In a lathe, the combination of a clutch for controlling the feed, a movable rod connected with the clutch for operating it, a spring for forcing said rod in a certain direction, a latch-dog on the rod, a seat for said latch-dog in position to permit the reversal of the feed when the latch dog moves to a certain position on the seat, and a projection from said seat in position to engage the latch-dog and hold it in such position as to stop the feed.

7. In a lathe, the combination of a clutch for controlling the feed, a movable rod connected with said clutch for operating it, a spring for holding the rod in reversing position, a latch-dog on the rod, a seat against which said latch-dog engages when the rod is in reversing position, a projection against which the latch-dog engages when the rod is in neutral position, and removable means for holding the latch-dog away from said seat and projection.

8. In a lathe, the combination of a clutch for controlling the feed, means for holding the clutch in position to drive the lathe forward, means for normally urging the clutch into reverse position, a projection for holding the clutch in inoperative position, a feed screw, an open-and-shut nut, and means connected with said nut for positively holding the clutch in inoperative position when the nut is closed on the feed screw.

9. In a lathe, the combination of a carriage, a slide thereon, and a centering stop pivotally mounted on the carriage, the end of the stop being adapted to engage the slide in central position.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

FRED K. HENDRICKSON.

Witnesses:

LOUIS W. SOUTHGATE,
MARY E. REGAN.