

C. L. LIBBY.
TURRET FEED STOP FOR LATHES.
APPLICATION FILED FEB. 6, 1908.

968,374.

Patented Aug. 23, 1910.

3 SHEETS—SHEET 1.

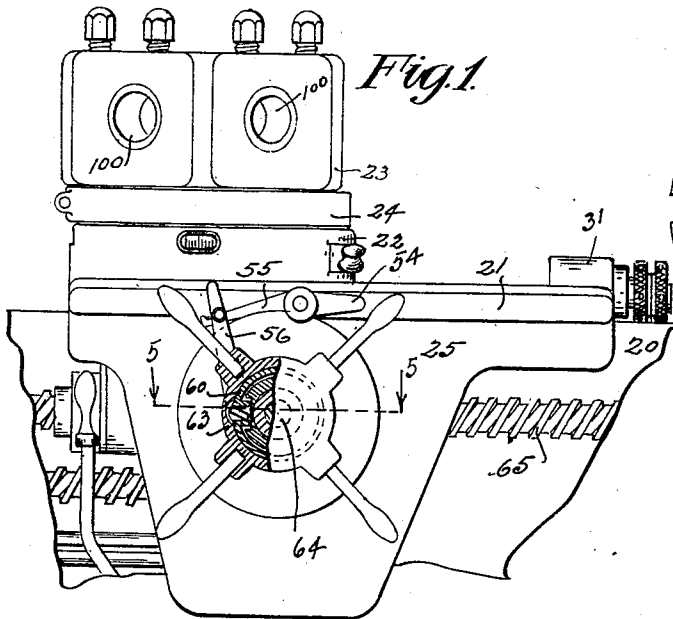


Fig. 1

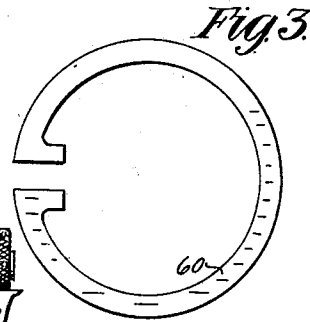


Fig. 3

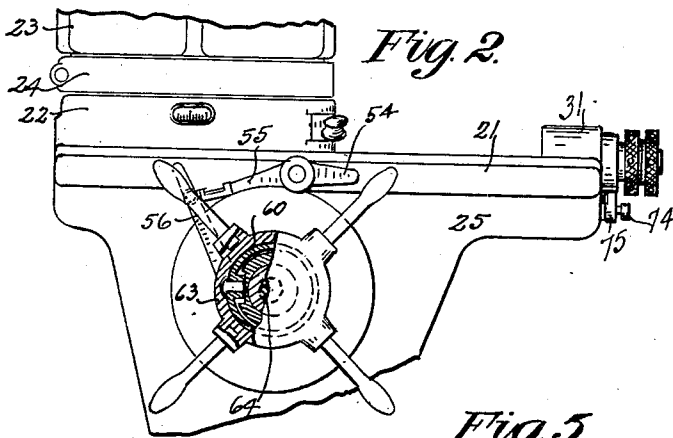


Fig. 2

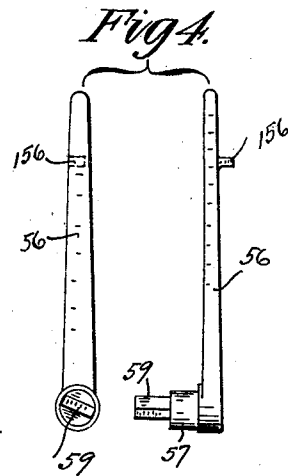


Fig. 4

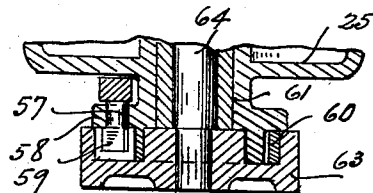


Fig. 5

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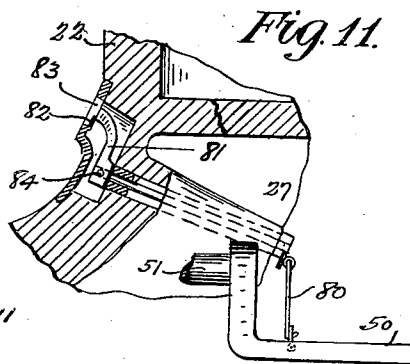
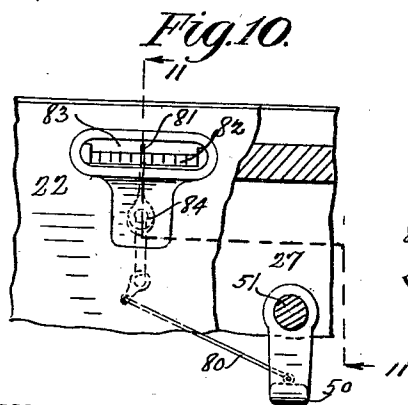
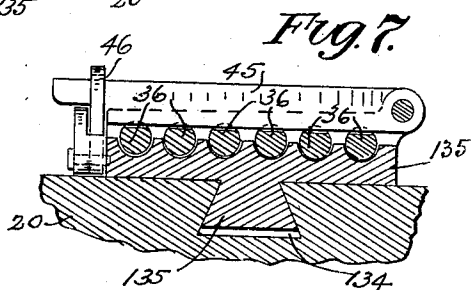
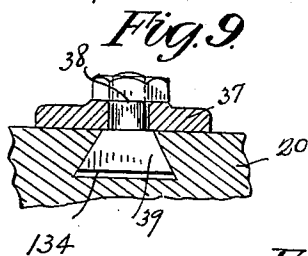
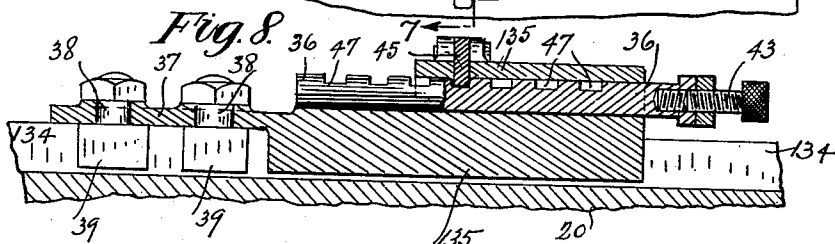
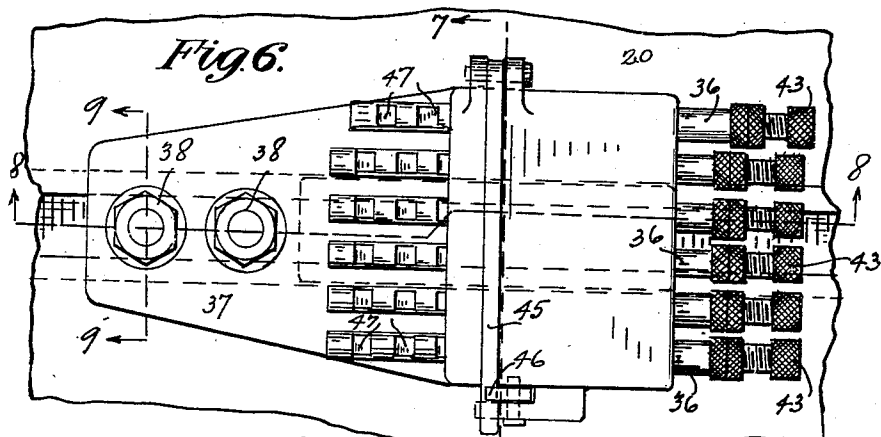
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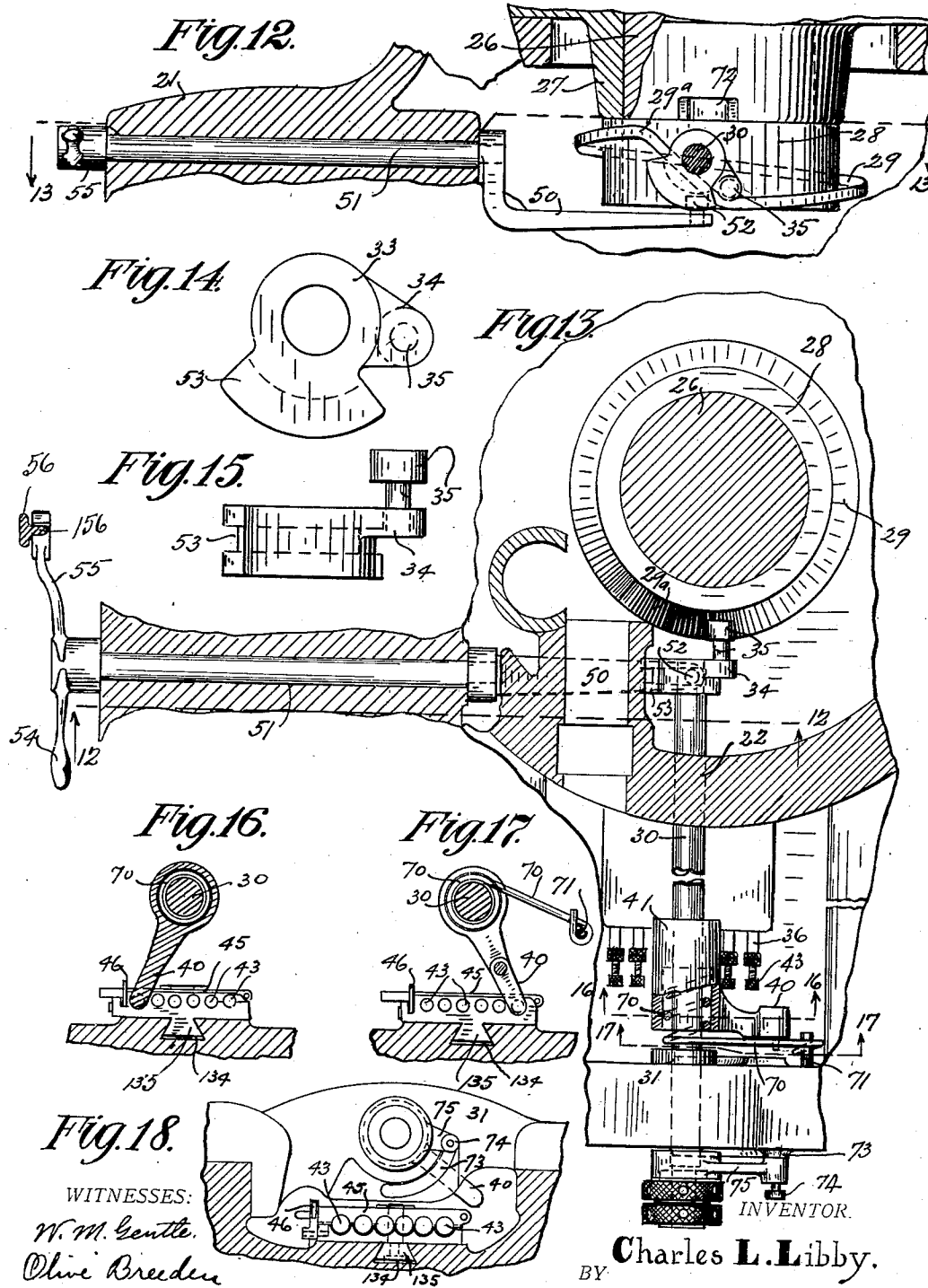
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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TURRET-FEED STOP FOR LATHES.

968,374.

Specification of Letters Patent. Patented Aug. 23, 1910.

Application filed February 6, 1908. Serial No. 414,502.

To all whom it may concern:

Be it known that I, CHARLES L. LIBBY, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Turret-Feed Stop for Lathes; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

The object of this invention is to provide an improved stop mechanism for controlling the feed of the turret in a turret lathe.

One feature of the invention consists in the combination with a downward extension from the turret, of an adjustable stop mechanism controlled by the revoluble adjustment of the turret, whereby the stop mechanism is adjusted indirectly and automatically when the operator turns the turret to bring the desired tool therein into working position. To this end the turret is provided with a downward projection carrying a cam-shaped flange which oscillates the feed stop shaft so as to set the stop arm thereon in position to engage a certain one of a number of stops. There is one stop corresponding with each tool carried by the turret and the various stops can be variously adjusted so that one tool will cut a certain distance and another tool a different distance, whereby each tool can do its appropriate work and the stop mechanism will be controlled by the adjustment of the turret itself.

Another feature of my invention consists in novel means actuated by the feed stop shaft for stopping the feed mechanism. Along with this part of the invention there is provided a split ring clutch operable indirectly by the feed stop shaft for stopping and starting the turret feed.

Another feature of the invention consists in providing in connection with the foregoing an indicator for use in doing very fine work. The feed stop mechanism is approximately adjusted to the work desired and, when the feed is stopped thereby, the stopping position will be indicated, and a scale is provided in connection with the indicator whereby the operator is informed to what extent he should further feed the turret by hand in order to make the particularly accurate cut desired.

The full nature of this invention will be understood from the accompanying draw-

ings and the following description and claims.

In the drawings Figure 1 is a side elevation of a part of the turret lathe, parts being broken away and parts in section. Fig. 2 is the same view of a part of what is shown in Fig. 1 with the feed unlocked. Fig. 3 is an elevation of the friction ring. Fig. 4 shows front and side elevations of the friction lever. Fig. 5 is a horizontal section on the line 5—5 of Fig. 1. Fig. 6 is a plan view of the stop block mechanism and a portion of the bed of the lathe. Fig. 7 is a transverse section on the line 7—7 of Fig. 6. Fig. 8 is a longitudinal section on the line 8—8 of Fig. 6. Fig. 9 is a section on the line 9—9 of Fig. 6. Fig. 10 is a side elevation of a portion of the upper part of the turret base and showing the feed indicating mechanism. Fig. 11 is a vertical transverse section on the crooked line 11—11 of Fig. 10. Fig. 12 is a vertical section on the line 12—12 of Fig. 13, parts being in elevation. Fig. 13 is partly in plan and partly in section on the line 13—13 of Fig. 12, parts of the turret base being broken away. Fig. 14 is a side elevation of the disk on the inner end of the stop shaft. Fig. 15 is a plan view of the same. Fig. 16 is a vertical section on the line 16—16 of Fig. 13. Fig. 17 is a vertical section on the line 17—17 of Fig. 13. Fig. 18 is an end elevation of the near end of the construction shown in Fig. 13.

As shown in the drawings, there is a lathe bed 20 with a turret slide 21 mounted thereon and having an upward projection 22 on which the turret 23 is mounted, said turret being secured on the part 22 by a clamp ring 24. To the under side of one lateral edge of the turret slide the apron 25 is secured.

As seen in Fig. 12, there is a central downwardly extending turret post 26 from the turret that fits in the bearing ring 27 which is secured upon the turret slide 21. Upon the lower end of the turret post a cam ring 28 is secured, it having an annular cam-like flange 29 secured about its periphery. This cam-like flange at 29^a has a sharp inclination, whereas at other points the inclination is gradual.

There is a feed stop shaft 30 mounted horizontally above the lathe bed in the bearing 31 at one end of the turret slide and in one wall of the extension 22 near the middle

of the turret slide; and upon the inner end of said shaft a disk 33 is secured having an arm 34 carrying a pin 35 which rides upon and is actuated by the cam-like flange 29 above described. Under said shaft 30 there is a dove-tailed groove 134 longitudinally of the bed to receive the adjustable block 135 which carries the stop pins 36. The block 135 has an extension 37 with holes through it, whereby it is clamped in position on the bed by the bolts 38 that have dove-tail-shaped heads 39 fitting in the groove 134, as shown in Fig. 9. In this manner said block with its series of pins 36 may be adjusted and held in any position with reference to the feed stop arm 40 on the sleeve 41 that is secured rigidly on the shaft 30. A stop screw 43 is secured in the end of each pin 36 and the number of pins 36 agrees with the number of tool-holding places in the turret, and said pins are mounted longitudinally adjustable in the pin block 35, as shown in Figs. 6, 7 and 8, and the pin block is provided with six longitudinal holes for that purpose. In the portion of the pin block 135 above the pins 36 there is a transverse slot for the latch bar 45 which is hinged at one side of the block 35 and at the other end is held by the catch 46. The pins have a series of notches 47 in their upper sides to receive the latch bar 45. Consequently any pin can be independently adjusted so as to stop the turret feed to suit the tool and work at the time.

After the proper pin 36 has been set so as to throw the turret out of operation at the right point in its work, and the turret has been adjusted to bring the tool therein to the proper position for work, such turn of the turret revolves the cam-like flange 29 and it, acting through the pin 35, the disk 33 and shaft 30, will turn the stop arm 40 into the proper position to engage the screw 43 on the particular pin 36 that corresponds with the hole 100 in the turret holding the tool which is to be used.

During the operation of the lathe, the turret and turret slide move longitudinally of the bed, whereas the stop block 135 is held stationary in the bed. Therefore, when the screw 43 of the pin 36 is engaged by the stop arm 40 secured to the shaft 40, it will stop the further movement of the shaft 30 and, as the turret slide proceeds further, draw the disk 33 so as to move the arm 50 secured to the feed stop rod 51 far enough to trip the feed of the turret and turret slide on the bed. For that purpose the inner end of the arm 50 has a pin 52 that projects up into the slot 53 on the under side of the disk 33, as seen in Fig. 12.

The feed stop 51 is mounted transversely of the machine and horizontally in the turret slide and projects out to one side thereof and has secured to it a handle 54 and also

an arm 55 that engages pin 156 on the friction lever 56 which is fulcrumed by means of the pin 57 in the circular flange 58, projecting from the apron 25, see Fig. 5. The bearing pin 57 of the friction lever 56 has a flat extension 59 that projects in between the split ends of the friction ring 60, see Fig. 3, so as to open said ring.

The friction clutch ring 60 is mounted within the pilot wheel 63 so that, when the split ring is spread into frictional engagement with the pilot wheel 63, it locks the pilot wheel from rotation. The pilot wheel is mounted on the shaft 64, that extends to and controls the operation of the feed mechanism, which, however, is not herein shown as this stop feed mechanism may be used in connection with the various forms of feed mechanisms. When the split ring 60 is expanded it starts the feed and when the lever 56 is thrown into the position shown in Fig. 2 to permit the ring 60 to contract, the pilot wheel can then revolve and the feed will be stopped.

On the shaft 30, see Figs. 13 and 17, there is a spring 70 coiled spirally that is fastened at one side to the pin 71. The spiral end of the spring is coiled within the sleeve 41, so that said spring has two functions. The spiral form thereof causes it to move the shaft 30 longitudinally to return it to its normal position after the feed mechanism has been thrown out of gear automatically, as above described, and after the turret has been returned to its starting position again. Likewise, said spring 70 has a torsional effect on the rod 31 that tends to hold the pin 35 down upon the cam-like flange 29 all the time.

When it is desired to operate the turret without the stops heretofore described, the lever 75 on the outer end of the shaft 30 is oscillated or its outer end turned upwardly until the pin 74 reaches the upper end of the boss 73 and enters a hole or dent, and when in that position the arm 40 on the shaft 30 will have been oscillated far enough so that it will not engage any stop, but ride above the right hand one, and at the same time the pin 35 at the other end of the shaft 30 will project above the highest point of the cam-like flange 29 and rest in the notch 72 in the downward extension from the turret, see Fig. 12.

The stop mechanism heretofore described satisfactorily controls and stops the machine while doing ordinary work requiring ordinary accuracy. When, however, it is necessary to do very fine work, beyond the accuracy of the stop mechanism heretofore described, I provide in connection with said stop mechanism an indicator for indicating in very small fractions the cutting movement of the machine, whereby the operator is enabled to complete the cutting operation,

when very fine work is being done, by the further feeding movement of the machine by hand. To the foregoing end a connecting rod 80 is pivoted to the arm 50 on the feed stop rod 51, and when said arm 50 is given a horizontal swinging movement by the disk 33 on the feed rod 30 as the latter stops, the indicator 81 is moved along a scale 82 visible in the slot 83 in the side of the turret base extension 22. The indicating finger 81 is fulcrumed at 84 between its ends.

To do very fine work the stop mechanism above described is set so as to approximately finish the cut; when the machine is stopped by such stop mechanism, the indicating finger 81 is moved along the scale 82 to a certain indicating point or mark. Then the operator can tell by said scale, the spaces of which may represent thousandths of an inch in the cutting movement of the machine, exactly how much farther to feed the machine by hand to cause it to cut with the fine degree of accuracy desired for the particular work in hand.

What I claim as my invention and desire to secure by Letters Patent is:

1. A lathe including a bed, a turret slide thereon, a turret revolubly mounted on said slide means for feeding said turret slide along the bed, a plurality of stationary stops, a shaft traveling with said turret, means actuated by said shaft for stopping the feed, an arm mounted on said shaft and adapted to engage any one of said stops, means controlled by the revoluble movement of the turret for turning said shaft so said arm will engage the proper stop, and means for holding said arm in a position not to engage any stop.

2. A lathe including a bed, a turret slide thereon, a turret revolubly mounted on said slide and provided with a downward extension, means for feeding said turret slide along the bed, a plurality of stationary stops, a shaft traveling with said turret, means actuated by said shaft for stopping the feed, an arm on said shaft adapted to engage any one of said stops, an eccentric pin mounted on said shaft, a cam like flange surrounding the downward extension from the turret upon which said pin rides, whereby a revoluble movement of the turret will turn the shaft so as to cause the arm thereon to engage the proper stop, and a recess in said turret to receive said eccentric pin and hold the shaft so the arm thereon will not engage any stop.

3. A lathe including a turret, an adjustable mechanism for stopping the feed thereof, an indicator controlled by said feed stop mechanism for indicating the exact position at which the turret stopped, and a scale with said indicator to indicate the extent of any further movement of the turret by the hand.

4. A lathe including a turret, means for feeding the turret, an oscillatory rod for stopping the feed, an indicator, a scale along which it moves, and a connection between the indicator and said feed stop rod, whereby the extent of oscillatory movement of the rod will be indicated by the indicator.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

CHARLES L. LIBBY.

Witnesses:

OLIVE BREEDEN,
V. H. LOCKWOOD.