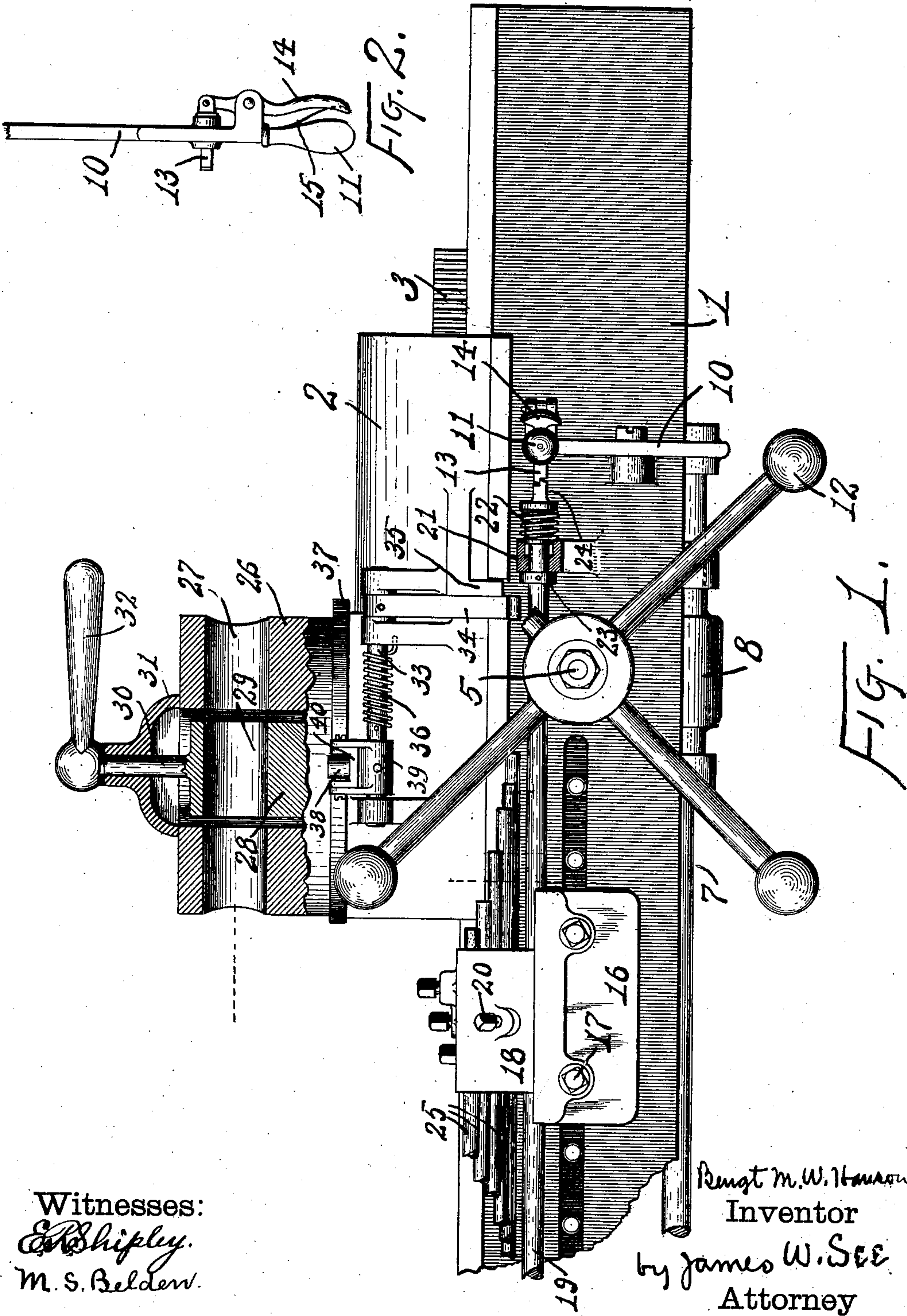


B. M. W. HANSON.  
LATHE TURRET STOP.  
(Application filed Dec. 2, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
*E. Shipley.*  
*M. S. Belden.*

B. M. W. Hanson  
Inventor  
by *James W. See*  
Attorney

No. 701,719.

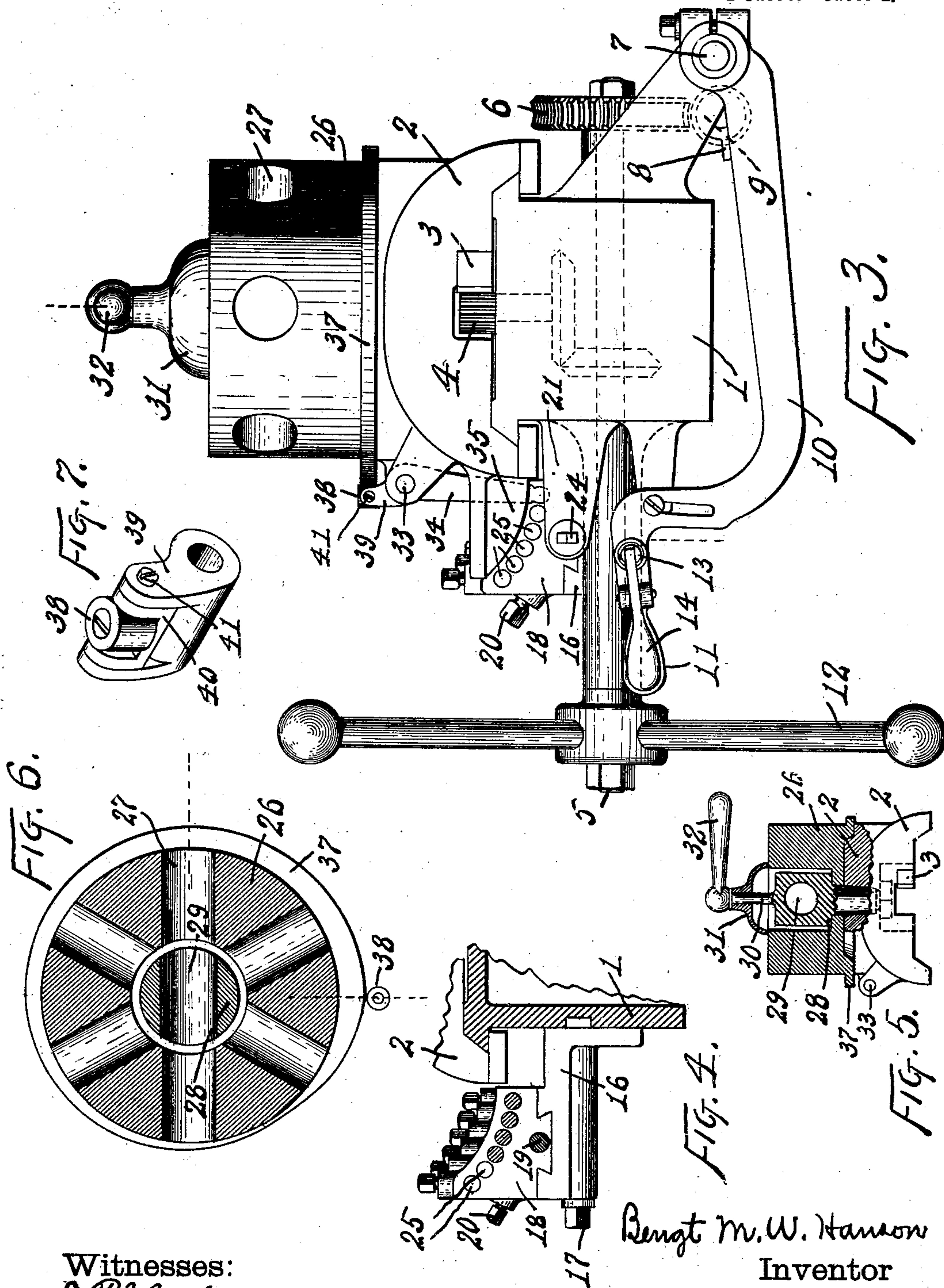
Patented June 3, 1902.

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2 Sheets—Sheet 2.



Witnesses:  
*E. Shipley,*  
*M. S. Belton.*

Bengt M. W. Hanson  
Inventor  
by *James W. See*  
Attorney



# UNITED STATES PATENT OFFICE.

BENGT M. W. HANSON, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT.

## LATHE-TURRET STOP.

SPECIFICATION forming part of Letters Patent No. 701,719, dated June 3, 1902.

Application filed December 2, 1901. Serial No. 84,320. (No model.)

*To all whom it may concern:*

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, residing at Hartford, Hartford county, Connecticut, have invented certain new and useful Improvements in Lathe-Turret Stops, (Case B,) of which the following is a specification.

This invention pertains to improvements in that class of feed-stops for the turrets of turret-lathes in which there are as many stops as there are turret-tools, each individual stop being appropriated to a particular turret-tool and the selection of the active stop being controlled by the angular adjustment of the turret, so that whenever a given turret-tool is in active position then its individual stop is in active condition.

The invention will be readily understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a turret-lathe embodying an exemplification of the present invention, a portion of the turret appearing in vertical section; Fig. 2, a plan of a portion of the throw-out lever of the feed; Fig. 3, an end elevation of the structure appearing in Fig. 1; Fig. 4, an elevation, viewed from the tail end of the lathe, of the bracket and sliding block carrying the stop-rods, the lathe-bed and some of the rods appearing in vertical section; Fig. 5, an elevation, viewed from the tail end of the lathe, of the turret-slide, the same appearing partly in transverse section and the turret and some of its accessories appearing in diametrical section; Fig. 6, a sectional plan of the turret, and Fig. 7 a perspective view of the roller-arm on which the turret-cam acts.

In the drawings, 1 indicates the lathe-bed; 2, the turret-slide; 3, the feed-rack secured to the turret-slide; 4, a pinion gearing to that rack; 5, a feed-shaft journaled across the bed and geared to pinion 4; 6, a worm-wheel fast on the rear end of shaft 5; 7, a power-shaft journaled at the rear side of the bed and adapted to receive rotary motion; 8, a drop-box disposed below worm-wheel 6 and swinging up and down on the axis of shaft 7, and 9 a worm journaled in the drop-box and

geared to shaft 7 and adapted by the vertical movement of the drop-box to move into or out of engagement with the worm-wheel, all of the parts thus far referred to being of ordinary construction; 10, a lever secured to drop-box 9 and extending forwardly to the front of the bed; 11, a handle on the forward end of lever 10, by means of which worm 9 may be raised into or lowered out of engagement with the worm-wheel; 12, a capstan-wheel on the front end of shaft 5, by means of which the feed-shaft may be turned to feed the turret-slide along the bed by hand; 13, a latch-pin sliding across in and near the forward end of lever 10, its active end projecting toward the head-stock of the lathe; 14, a latch-lever mounted on lever 10 near its handle 11 and connected with latch-pin 13, whereby the latch-pin may be moved endwise; 15, a spring serving to press latch 13 normally to active position—that is to say, in a direction toward the head-stock; 16, a bracket mounted upon the front of the lathe-bed and preferably arranged so that it can be adjusted along and fixed in different positions upon the bed, the illustration showing this bracket as having sliding engagement with a slot in the front of the bed; 17, screws by means of which the bracket 16 can be secured in selective positions along the bed; 18, a block having free sliding motion in bracket 16 in a direction parallel with the length of the lathe-bed, the illustration showing the base of this block as having a dovetailed sliding connection with the top of the bracket; 19, a trip-rod disposed parallel with the lathe-bed and passing through block 18 and having its tail end in the path of latch-pin 13 as the latch-pin rises and falls with lever 10; 20, a set-screw in block 18 for binding the block to trip-rod 19 in adjusted position; 21, a bearing supported by the lathe-bed for trip-rod 19 near the tail end of that rod; 22, a spring disposed upon the trip-rod between a collar thereon and the bearing 21 and serving to urge the trip-rod toward latch-pin 13; 23, a collar on the trip-rod engaging against bearing 21 on its side opposite the one engaged by pin 22, this collar limiting the endwise movement of the trip-rod toward the latch-pin; 24, the tail end of trip-rod



19, the same being formed into a latch pivoted to engage under latch-pin 13 when the latch-pin is in upper position, corresponding with the engaged condition of the feed-worm 9 and adapted to be withdrawn from engagement with the latch-pin by endwise movement of the trip-rod to the left or by endwise movement of the latch-pin to the right, under which disengaged condition lever 10 will fall and drop the worm out of engagement with the worm-wheel; 25, a series of stop-rods passing through sliding block 18 and held therein by set-screws, these stop-rods being arranged parallel with each other and parallel with the bed of the lathe, the series being arranged in an arc of a circle, there being as many of these stop-rods as there are tool-holders in the turret—six in the present instance; 26, the turret mounted upon the turret-slide and having its pintle-hole counterbored from above; 27, the tool holders or sockets in the turret, the same being illustrated as radially-arranged cylindrical sockets, the axes of opposite sockets being coincident; 28, the turret-pintle, the same being rigidly secured in the turret-slide and engaging the lower central bore of the turret and having an upper diameter greatly in excess of the diameter of the tool-sockets 27 of the turret; 29, an opening extending diametrically through the turret-pintle, its axis coinciding with the common axis of the tool-sockets 27 of the turret; 30, the turret binding-screw projecting rigidly upward above the turret from pintle 28; 31, a washer upon screw 30, bearing upon the top of the turret free from the top of the pintle; 32, a hand-nut on screw 30, by means of which the turret may be clamped firmly down to the turret-slide; 33, a rock-shaft mounted upon the front of the turret-slide parallel with stop-rods 25 and having its axis located at the center of the arc of location of the series of stop-rods; 34, an arm fast on rock-shaft 33 and projecting downwardly and adapted to be rocked into position opposite the tail end of any particular one of the stop-rods 25, Fig. 3 showing this arm as being disposed opposite the innermost one of the stop-rods; 35, a bracket projecting rigidly from the turret-slide and engaging the tailward side of arm 34 to enable that arm to better meet the thrust of the stop-rods; 36, a spring upon rock-shaft 33, urging arm 34 to its outermost position; 37, a cam upon the turret, the same being illustrated as having a constantly-increasing radius for five-sixths of its circumferential extent, the remainder of its periphery being a mere joining curve; 38, a roller carried by an arm on rock-shaft 33 and engaging the cam, so that arm 34 will be given angular positions of adjustment in correspondence with the angular adjustment of the turret; 39, the arm on rock-shaft 33, which carries roller 38; 40, a rocking carrier mounted in arm 39 and carrying roll 38; and 41 horizontal pivots with their common axes parallel with rock-shaft 33, uniting this carrier to

arm 39, whereby the roller is adapted to maintain a fair bearing against the cam in the various angular positions of the arm which carries it. 7c

In Fig. 3 lever 10 appears in drop position, worm 9 being out of engagement with its worm-wheel and the power-feed derived from shaft 7 being inactive. The turret-slide may now be moved along the bed by hand through the medium of capstan-wheel 12. If lever 10 be elevated, the worm will be engaged with its worm-wheel and the latch-pin will engage the latch end of the trip-rod, whereby the power-feed will be maintained in active condition. By withdrawing the latch-pin through the medium of latch-lever 14 the feed may at any time be thrown out of action. In Fig. 1 the latch-pin is shown as engaged with the trip-rod, corresponding with the active condition of the power-feed. Under these conditions the turret-slide feeds forward to the left. In course of time the arm 34 will make contact with the tail end of the innermost one of the stop-rods 25 and push block 18 to the left, thus moving the trip-rod to the left and disengaging the latch and causing the feed to be thrown out of action. This throwing out of the feed may not be accurate enough in point of slide travel to do accurate shoulder-work. Hence after the feed has thus gone out of action the turret-slide may be fed forward by hand. The shoulder on the trip-rod will soon engage the bearing 21 and the trip-rod can move no farther, thus positively arresting the turret-slide at an accurate predetermined point. The stop-rod in question will be adjusted in the block 18 to such position as corresponds with the desired arresting-point for the particular turret-tool then in operation. The work of the first turret-tool having been completed, the turret is retracted and turned to bring the next tool to active position. This angular motion of the turret through the medium of cam 37 causes arm 34 to rock forward, so as to be opposite the tail end of the second stop-rod, whose tailward projection from block 18 is assumed to have been adjusted to suit the stopping-point appropriate to the second turret-tool, and so on through the entire series of turret-tools, the bringing of any particular turret-tool to active position causing stop-arm 34 to take its position in the line of the appropriate stop-rod. Spring 36 causes the roller to always hug the cam, and the mounting of the roller in the rocking carrier 40 causes the roller to always bear fairly against the cam, and thus when the rocking carrier is employed avoids the necessity for the variable coning of the cam. The stop-rods 25 may be adjusted endwise, as desired, to suit the stopping position for the respective turret-tool, and it is quite immaterial which of the rods has the greater tailward projection from the block. The stop-rods may have any length desired according to the length of maximum turret travel; but the adjustment of bracket 16 to various positions along the length of the bed provides



extreme variations in the stopping-points of the several turret-tools and provides for long lathe-beds. Thus, for instance, on a comparatively long lathe-bed, with great difference in the stopping-points for the turret-tools, the bracket 16 may be secured far to the left, some of the stop-rods in that case projecting far to the right from block 18, while others project but a short distance to the right. For long work with hollow turret-tools, such as common box-tools, the stock passing through the active turret-tool may pass on through opening 29 in the turret-pintle and through the opposite tool-socket in the turret, and even through a tool in that opposite socket, if the bore of that tool will permit. The turret-mounting also permits of a tool-bar being mounted in the turret and extending entirely through it and engaging two diametrically opposite tool-sockets therein. It is to be observed that the turret-pintle 28 has a circumferential fit only in the lower portion of the bore of the turret, the shoulder of the pintle fitting down nicely upon the floor of the counterbore in the turret. This construction clamps the turret to the turret-slide with sufficient firmness for many operations of the machine—operations of such character that the binding action of the binder 32 is not required. This leaving of the turret-bore free from the upper portion of the pintle, in conjunction with the snug fitting under the shoulder of the pintle provides to a satisfactory degree against the entrance of chips to the rubbing-surfaces.

Many of the details of construction particularly set forth herein are to be understood as merely exemplifying in character and subject to modification at the hands of the skilled machine-constructor seeking a realization of my present invention, the exemplification set forth being simply the best mode in which I at present contemplate the application of the principle of my invention.

It has heretofore been proposed to mount a single stop-rod on the tail of a lathe to be engaged by a selective stop in a series of stops carried by the end of a swinging arm mounted on the turret-slide and swinging in unison with the turning of the turret, so that a given stop in said arm would be in line when the turret was put in a given angular position. Such proposed system would be satisfactory only for comparatively small variations in the stopping distances for the respective turret-tools, for it is obvious that the longest one of said stops carried by the arm can be no longer than the arm itself, and that the entire device was capable of operating only at the tail end of the lathe. In the modern use of the turret-lathe long shafts are turned with shoulders disposed at various points along the length of the shaft. In such case one turret-tool may require to be stopped when the turret has moved up near to the chuck, while the final turret-tool may require to be stopped very early in its advance and while

still near the tail of the lathe. It is thus seen that the projection of the longest stop beyond the shortest one may represent nearly the entire turning length of the lathe, which may in some cases be eight or ten feet. In my improved system the stop-rods may be the full length of the lathe-bed, if needed, and without producing any projection of any parts beyond the tail end of the lathe.

I claim as my invention—

1. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and power mechanism for feeding the slide along the bed, of a series of endwise-movable parallel stop-rods supported by the lathe-bed independent of the turret-slide, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of and move any one of said rods, a cam turning in unison with the turret and adapted to swing said arm to position corresponding with the angular adjustment of the turret, a feed-release device, and mechanism connecting said endwise-movable stop-rods and feed-release device to cause the latter to release by the endwise movement of any of said stop-rods.

2. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and power mechanism for feeding the slide along the bed, of a series of endwise-movable longitudinally-adjustable parallel stop-rods supported by the lathe-bed independent of the turret-slide, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of and move any one of said rods, a cam turning in unison with the turret and adapted to swing said arm to position corresponding with the angular adjustment of the turret, a feed-release device, and mechanism connecting said stop-rods and feed-release device and serving to release the latter upon the endwise movement of any of the stop-rods.

3. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and power mechanism for feeding the slide along the bed, of a series of endwise-movable parallel stop-rods supported by the lathe-bed independent of the turret-slide, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of and move any one of said rods, a cam upon the turret and adapted to swing said arm to position corresponding with the angular adjustment of the turret, a feed-release device, and mechanism connecting said feed-release device and stop-rods to cause the former to be actuated upon the endwise movement of any of said stop-rods.

4. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and releasable power mechanism for feeding the slide along the bed, of a block supported by and adapted for longitudinal sliding motion on the lathe-bed, a series of parallel stop-rods carried by said block,



- a trip-rod carried by said block and adapted as it moves endwise to trip and release the power feed mechanism, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of any one of said rods; and a cam turning in unison with the turret and adapted to swing said arm to position corresponding with the angular adjustment of the turret.
5. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and releasable power mechanism for feeding the slide along the bed, of a block supported by and adapted for longitudinal sliding motion on the lathe-bed, a longitudinally-adjustable series of parallel stop-rods carried by said block, a trip-rod carried by said block and adapted as it moves endwise to trip and release the power feed mechanism, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of any one of said rods, and a cam turning in unison with the turret and adapted to swing said arm to position corresponding with the angular adjustment of the turret.
6. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and releasable power mechanism for feeding the slide along the bed, of a block supported by and adapted for longitudinal sliding motion on the lathe-bed, a series of parallel stop-rods carried by said block, a trip-rod carried by said block and longitudinally adjustable therein and adapted as it moves endwise to trip and release the power feed mechanism, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of any one of said rods, a cam turning in unison with the turret and adapted to swing said arm to position corresponding with the angular adjustment of the turret, and a bracket longitudinally adjustable along the lathe-bed and furnishing the slide-bearing for said block.
7. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and power mechanism for feeding the slide along the bed, of a series of parallel stop-rods supported by the lathe-bed, an arm carried by the turret-slide upon an axis at right angles to that of the turret and adapted to be swung into position to engage the tail end of any one of said rods, a cam formed upon the turret, a cam-arm connected with the first-mentioned arm, a roll-carrier pivoted to the cam-arm on an axis at right angles to that of the turret, a roll mounted in said roll-carriers on an axis at right angles to that of the cam-arm and engaging said cam, and a feed-release device actuated upon the engagement of the first-mentioned arm with one of said stop-rods.
8. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and a feed-shaft, of a worm-wheel connected with the feed-shaft, a dropping worm-box, a worm therein, a lever connected with the worm-box, a latch carried by said lever, a sliding block supported by the lathe-bed, a trip-rod connected with said block and adapted to engage said latch, a series of parallel stop-rods carried by said block, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of any one of said stop-rods, and a cam turning in unison with the turret and cooperating with said arm to cause the same to swing to position corresponding with the angular adjustment of the turret.
9. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and a feed-shaft, of a worm-wheel connected with the feed-shaft, a dropping worm-box, a worm therein, a lever connected with the worm-box, a latch carried by said lever, a sliding block supported by the lathe-bed, a trip-rod connected with said block and adapted to engage said latch, a spring urging said trip-rod in the latch-engaging direction, a stop to limit the motion of the trip-rod in the disengaging direction, a series of parallel stop-rods carried by said block, an arm carried by the turret-slide and adapted to be swung into position to engage the tail end of any one of said stop-rods, and a cam turning in unison with the turret and cooperating with said arm to cause the same to swing to position corresponding with the angular adjustment of the turret.
10. In a turret-lathe, the combination, substantially as set forth, with a lathe-bed, a turret-slide, a turret, and releasable power mechanism for feeding the slide along the bed, of a feed-releasing part, a hand-latch carried thereby, an endwise-moving trip-rod supported by the bed and adapted to engage said latch and hold the feed in action, and provision for causing said trip-rod to be moved in released direction by the advancing turret-slide, whereby the engagement of the latch and the trip-rod may be suppressed either by the hand movement of the latch or by the mechanical movement of the trip-rod.
11. In a turret-lathe, the combination, substantially as set forth, of a lathe-bed, a turret-slide mounted thereon, a turret mounted for rotation upon the turret-slide and provided with a central bore counterbored from above, a pintle firmly secured in the turret-slide and fitting the lower portion of the bore of the turret and having a shoulder engaging the floor of the counterbore in the turret, a binding-screw projecting from the pintle to a point above the turret, a washer on said screw over the turret, and a binding-nut upon said screw over the washer.
12. In a turret-lathe, the combination, substantially as set forth, of a lathe-bed, a turret-slide mounted thereon, a turret mounted for rotation upon the turret-slide and provided with radial tool-sockets arranged in pairs so that the axis of one socket will be in alignment with the axis of the opposite socket, the turret having an axial bore counterbored from



above to a diameter greater than that of said tool-sockets, a pintle firmly secured in said turret-slide and fitting the lower portion of the bore of the turret and having a body 5 smaller than said counterbore and provided with a shoulder engaging the floor of the counterbore in the turret and provided with a transverse opening with its axis in the common plane of all the tool-sockets, a binding-

screw projecting from said pintle to a point 10 above the turret, a washer on said screw over the turret, and a binding-nut upon said screw over the washer.

BENGT M. W. HANSON.

Witnesses:

F. V. BARTLETT,  
W. M. STORRS.