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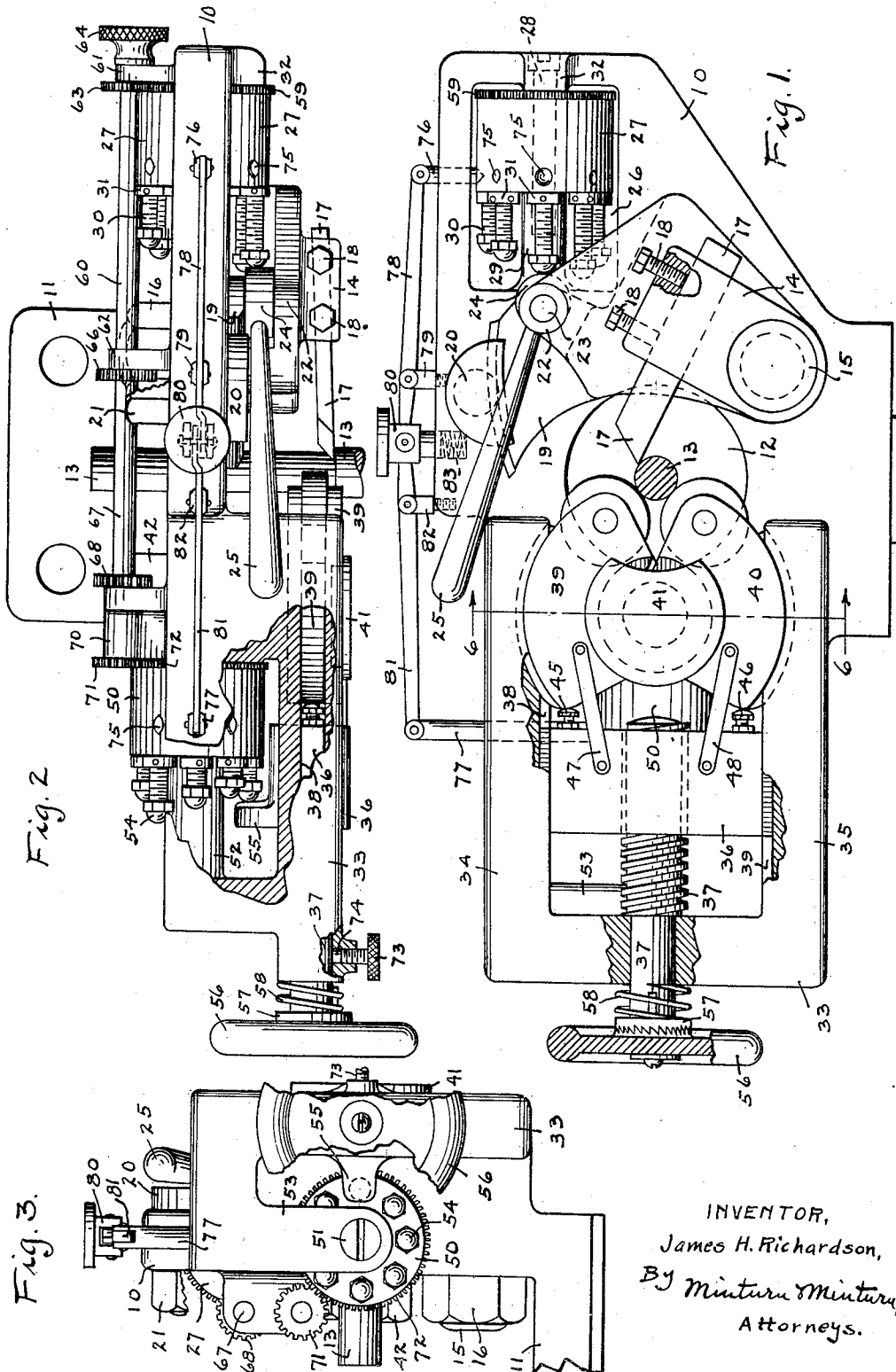
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1,906,100

ROLLING TURNER

Filed Jan. 30, 1932

2 Sheets-Sheet 1



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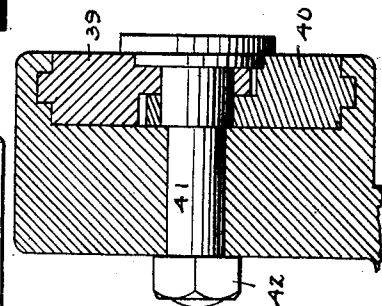
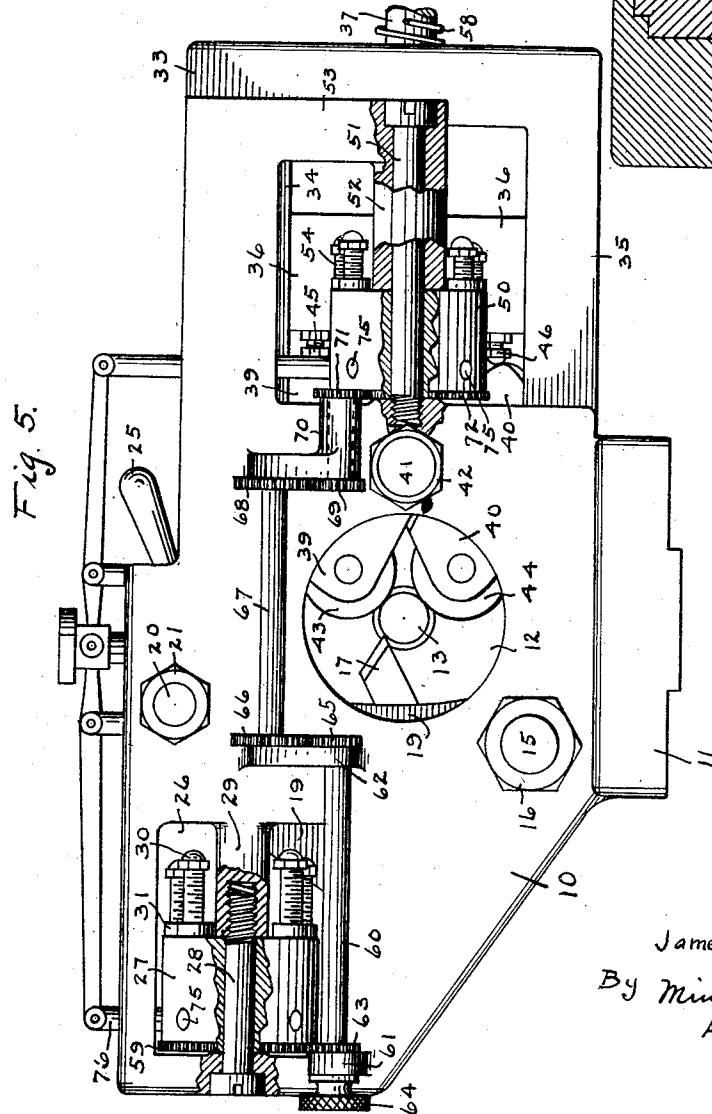
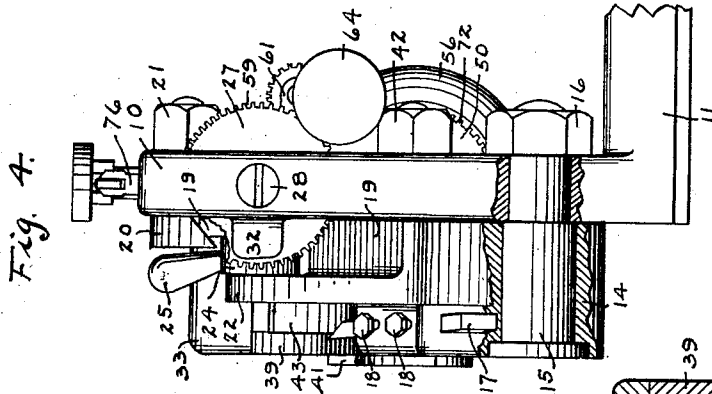
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2 Sheets-Sheet 2



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## UNITED STATES PATENT OFFICE

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ROLLING TURNER

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This invention relates to means to be mounted on the turret head of a turning lathe in order that a plurality of diameters may be turned in one position of the head and the remaining positions of the head be utilized for further operations. The usual turret head is provided with six vertical or horizontal faces on which various tools may be secured to have the individual tool come into position for the cutting operation as desired upon the rotation of the head from one position to the other. By employing my structure herein described, one of these positions on the head is employed only for the mounting of the structure thereon and the remaining faces on the head can carry additional tools as usual. The primary purpose of my invention is to permit the tooling up of the head for operations in number exceeding the number of faces carried by the head.

In the form of my structure herein shown and described eight different diameters may be turned with one setting of the turret head and additional diameters may be turned by revolving the head as usual to bring other tools into position as may be secured on the additional faces thereon. For example, supposing the head to have the usual six faces, a maximum of thirteen operations may be performed with one complete set up of the turret head, my structure increasing the number of operations from six to thirteen. I have termed my invention a rolling turner and the nature of it will become apparent in the following description with reference being made to the accompanying drawings, in which

Fig. 1 is a fragmentary front elevation of a structure embodying my invention;

Fig. 2, a fragmentary top plan view;

Fig. 3, a fragmentary left hand end elevation;

Fig. 4, a fragmentary right hand elevation;

Fig. 5, a fragmentary rear elevation, and

Fig. 6, a vertical transverse section on the line 6—6 in Fig. 1.

Like characters of reference indicate like parts throughout the several views in the drawings.

I form a vertically aligned plate 10 from the lower rear side of which horizontally extends a mounting bracket 11. The plate 10 is provided with a hole 12 through which the stock 13 to be operated upon may be passed. A tool carrier 14 is rockably secured against the front face of the plate 10 by means of the bolt 15 passing through the block to abut the front face of the plate by a shoulder and extend on through the plate by a reduced diameter to have a nut 16 screw-threadedly engage the bolt from the rear side of the plate. The block 14 is provided with a hole therethrough to carry the cutting tool 17 and set screws 18 are provided to hold the tool in the desired position. A plate 19 extends upwardly from the block 14 in sliding contact with the front face of the plate 10 and has its upper end beveled to pass slidingly under the head of the bolt 20 which passes through the plate 10 and carries the adjusting nut 21 on its rear end. The underside of the head of the bolt 20 is beveled, Fig. 4, to correspond with the bevel on the end of the plate 19 so that by drawing the bolt 20 through the plate 10, the beveled underside of the bolt head will draw the plate 19 back against the plate 10. By thus guiding the upper end of the plate 19, the cutting tool 17 is prevented from moving laterally in reference to the plate 10.

Immediately above the carrier or block 14 and carried by the plate 19 is an upwardly turned ear 22 and a pin 23 is passed through this ear and into the plate 19 to rockably carry a cam 24 thereon. A handle 25 is fixed to the cam as a means of revolving the cam about the supporting pin. In referring above to the carrier or block 14 and the plate 19, it will be understood, upon referring to the drawings, that the block 14 is an integral part of and extends forwardly from the plate 19.

To the right and somewhat above the hole 12, the plate 10 is provided with another opening 26 here shown as being substantially rectangular in shape. A cylinder 27 is revolvably mounted in this opening 26 on a screw 28 which is entered through the right end of the plate 10 and passed revolvably through the cylinder 27 and screwthreadedly engaged

in the end of a post 29. The post 29 is an integral part of the plate 10 and extends from the left side of the opening 26 toward the right along the longitudinal center line of the opening to abut the left hand end of the cylinder 27. On the left hand face of the cylinder 27 are located a plurality of posts 30, each of which screwthreadedly enters the cylinder 27 with its axis parallel to the axis of cylinder 27. The number of these posts 30 is here shown as eight equally spaced around the end of the cylinder. The outer ends of these posts are rounded and have a hexagonal head adjacent the rounded end as a means of turning the posts in the cylinder 27. In order to retain the posts in any position of the heads thereof in relation to the distance from the end of the cylinder, collars 31 are provided, one on each post screwthreadedly engaging it and adapted to be turned up against the face of the cylinder as a lock nut. The posts 30 are positioned around the face or end of the cylinder 27 to have their heads revolve in the path of the face of the cam 24 so that the degree of rotation of the tool carrier 14 to the right may be limited by the cam 24 striking against and bearing on the heads of these posts. In other words, by adjusting the lengths of each of the posts 30 which extend from the cylinder 27, the point of the tool 17 may be thus located to cut predetermined diameters by allowing the cam 24 to bear selectively against the end of that post corresponding to the diameter desired to be cut. By raising the handle 25 and swinging it around to the right, the cam 24 is correspondingly rocked to permit the tool 17 to rock to the right away from the stock 13 so that the stock may be shifted longitudinally or the cylinder 27 revolved without the tool striking the uncut part of the stock 13 or the ends of the posts 30 striking the cam as they may be revolved to a new position. In order that there may be no lateral rocking of the cylinder 27, I provide the post 32 to extend laterally from the front face of the plate 10 and around into sliding contact with the outer end of the cylinder 27 in direct line with that post 30 which is in contact with the cam 24.

Referring now to the left end of the plate 10, an integral extension is provided which comprises essentially a horseshoe shaped frame 33 having the top and bottom legs 34 and 35 respectively. The opposing inner faces of these legs are slotted centrally of their lengths to slidably receive and carry a block 36 whereby the block may be shifted along the slots toward and away from the hole 12. The extension 33 is parallel to but mounted somewhat forwardly from the front face of the plate 10. A screw shaft 37 screwthreadedly engages through the block 36 and extends rockably through the vertical connecting member between the outer ends of the

legs 34 and 35 whereby revolving of the screw 37 will move the block 36 longitudinally of the slots in the two legs. Toward the inner ends of the legs 34 and 35, the slots 38 and 39 therein are cut back into the legs arcuately to receive therein the tongues of the roller carriers 39 and 40 which are revolvably carried on the center bolt 41 extending transversely back through the plate 10 and secured by the nut 42. Rollers 43 and 44 are revolvably mounted in the right hand ends of these carriers 39 and 40 respectively and adjustable screws 45 and 46 are carried to extend from the right hand face of the block 36 to bear against the left hand sides of the carriers 39 and 40 as the block 36 may be advanced thereagainst. Connecting links 47 and 48 loosely tie the carriers 39 and 40 to the block 36 as means for rocking the carriers backwardly to increase the distance between the rollers 43 and 44 as the block 36 may be shifted to the left. The links 47, 48 merely serve as means to retract the rollers 43 and 44 from the center of the hole 12, and accurate distances between the rollers are maintained by the adjustments of the screws 45 and 46 against which the carriers compressively bear when the stock 13 is pressed against the rollers 43, 44 during the cutting operation.

Now to coordinate the locating of the rollers 43 and 44 in relation to the diameter of the stock 13 with a given cut to be taken thereon as determined by the location of the cylinder 27, I provide a locating cylinder 50 which cylinder is substantially a duplicate of the cylinder 27. This cylinder 50 is mounted on a longitudinal axis by passing a screw 51 through a horizontally disposed post 52 carried on the lower end of a downturned arm 53 revolvably through the cylinder 50 and screwthreadedly into the metal therebehind which connects the innermost ends of the legs 34 and 35 with the plate 10. A plurality of posts 54, eight in number to correspond with the number of posts on the cylinder 27, screwthreadedly engage the cylinder 50 from its left hand vertical face and are spaced equidistant therearound on the circumference of a circle so that the ends of the posts may be consecutively engaged by a back turned finger 55 extending from the block 36. By suitably adjusting these posts 54 to have the required lengths extending from the cylinder 50, the block 36 is intercepted in its travel toward the tool 17 to limit the amount of movement of the carriers 39, 40 thereby and consequently the distance between the rollers 43 and 44.

In order that the block 36 may always be stopped with the same degree of pressure of the finger 55 against a post 54, I provide a ratchet mechanism on the outer end of the screw shaft 37 which consists essentially of a

hand wheel 56 revolubly fixed to the end of the shaft 37 and having a hub with notches or teeth thereon adapted to be engaged by teeth projecting theretoward on a collar 57 which is keyed to the shaft 37 to revolve therewith but sliding longitudinally therealong, and a compression spring 58 urging the collar 57 toward the hub of the wheel 56. By turning the hand wheel 56, the block 36 may be advanced longitudinally along the legs 34 and 35 since the collar 57 is in engagement with the wheel through the interengaging teeth and upon the finger 55 striking the end of a post 54, continued rotation of the wheel 56 may be had but only by the collar 57 moving against the spring 58 to permit the teeth to slip over each other so that the strength of the spring 58 will control the amount of pressure by which the finger 55 will bear against any post 54.

In order that the cylinders 27 and 50 may be revolved in the proper sequence so that the rollers 43, 44 are set to receive proposed diameters of the stock 13 therebetween for the cut to be made by the tool 17, I provide means for simultaneously revolving the cylinders in unison. The cylinder 27 is provided with an annular gear 59 and a horizontally disposed shaft 60 is revolubly carried between the ears 61 and 62, Fig. 5, on the rear side of the plate 10 to have a spur gear 63 fixed thereon in constant mesh with the gear 59. A knurled handle 64 is fixed on the outer end of this shaft 60 as a means of revolving it. On the opposite end of the shaft 60 is a spur gear 65 which is in constant mesh with a spur gear 66 fixed on the shaft 67 mounted thereabove and carried across over the hole 12. On the other end of this shaft 67 is a second spur gear 68 in constant mesh with a spur gear 69 on a shaft therebelow which extends through the bearing 70 to carry a spur gear 71 which is in constant mesh with the gear 72 formed about the cylinder 50. The intermediate shaft 67 is provided merely as a means to go around the hole 12 in order that a free opening may be obtained so as to prevent any interference upon the insertion of stock therethrough. It is therefore to be seen that by revolving the handle 64, both cylinders 27 and 50 are simultaneously revolved in the same direction and at the same rate of speed since the gearing between gear 63 and the gear 71 is identical in speed ratio at each end of the shaft 67. Thus by adjusting the length of a post 30 on the cylinder 27 to give a desired location of the point of the tool 17 the diameter of the cut on the stock 13 is obtained and by adjusting the post on the cylinder 50 then in line to be contacted by the finger 55, the rollers 43 and 44 may be brought to the proper positions upon turning up the shaft 37 to move the block 36 and bring the finger 55 against that post.

It sometimes happens that in cutting stock,

for instance in taking the initial cut on hexagonal stock, considerable vibration is set up which might cause the rollers 43 and 44 to retract slightly by shaking the screw 37 to cause it to revolve. To prevent such movement of the rollers, I provide set screw 73, Fig. 2, which is adapted to carry a brass slug 74 against that part of the shaft 37 which passes through the end of the frame 33 so that revolving of the shaft is prevented. I also provide means for retaining the cylinders 27 and 50 in the selected positions. Such means is here shown as including a hole 75 in the circumferential wall of each cylinder at each location of the posts 30 or 54 as the case may be. In other words, there are eight holes 75 spaced equidistant around the circumference of each of the two cylinders. A pin 76 is slidably inserted through the top side of the plate 10 and carried vertically down there-through to drop normally by its lower end into the holes 75 as the cylinder 27 may be revolved therepast. Similarly a pin 77 is passed slidably and vertically down through that part of the casting extending rearwardly from the top leg 34 to have its lower end normally drop into the holes 75 in the cylinder 50 as it may be revolved. In order to raise and lower these pins 76 and 77 to permit the turning of the cylinders, a lever 78 is pivotally connected by its outer end to the end of the pin 76, fulcrumed over the post 79 and pivotally connected to the center post 80, and likewise a lever 81 has its outer end pivotally connected to the top end of the pin 77, fulcrumed over the post 82 and pivotally connected by its other end with the post 80. This post 80 has its lower end slidably entered in a bore in the top side of the plate 10 and rests by its lower end against a compression spring 83 so that the post 80 is normally urged upwardly to push the pins 76 and 77 downwardly. The pins may be lifted by pushing down on the post 80 to overcome the spring 83 and the post 80 is thus held therein while the thumb nut 64 is being turned. Release of the post 80 allows the pins 76 and 77 to bear by their lower ends against the respective cylinders and to drop into the next appearing holes 75 as the cylinders may be revolved and thereby prevent further rotation of the cylinders until the pins are again lifted.

While I have herein described and shown my invention in the best form now known to me, it is obvious that structural changes may be made without departing from the spirit of the invention and I, therefore, do not desire to be limited to that precise form beyond the limitations as may be imposed by the following claims.

I claim:

1. In a turning device, a plate, a tool holder rockably carried by the plate, a revoluble member carried by the plate, a plurality of posts adjustably carried by the member and

selectively limiting the movement of said holder in one direction, a stock rest including a pair of shiftable rollers, a shiftable block controlling the spacing apart of said rollers, a second revoluble member, and a plurality of posts adjustably carried by the second member and adapted to be selectively turned to intercept movement of the block whereby the posts on the two revoluble members may be relatively adjusted to limit the tool holder and arrest the block for the simultaneous cutting of a selected diameter on a piece of stock and the supporting of that stock by the rollers during that cutting.

2. In a device for turning a plurality of diameters on a length of revoluble stock by a single tool, a plate, a tool carrier pivotally mounted on the plate, a revoluble cylinder carried by the plate, a plurality of posts carried by the cylinder adapted to be directed one at a time toward said carrier upon rotation of the cylinder whereby the outward swing of the carrier away from the stock may be selectively limited as determined by the lengths of the posts, means for mounting a cutting tool on the carrier, a stock rest comprising a pair of rollers and rocker members carrying the rollers, a slidable block supported from said plate and against which said rocker members may swing to limit the spacing apart of the rollers, means for shifting said block, a second revoluble cylinder mounted adjacent said block, a plurality of posts carried by the second cylinder adapted to be selectively brought around by revolution of the cylinder to intercept said block in its movement to locate said block at the position required to maintain said rollers in the spaced relation to support the stock.

3. In a device for turning a plurality of diameters on a length of revoluble stock by a single tool, a plate, a tool carrier pivotally mounted on the plate, a revoluble cylinder carried by the plate, a plurality of posts carried by the cylinder adapted to be directed one at a time toward said carrier upon rotation of the cylinder whereby the outward swing of the carrier away from the stock may be selectively limited as determined by the lengths of the posts, means for mounting a cutting tool on the carrier, a stock rest comprising a pair of rollers and rocker members carrying the rollers, a slidable block supported from said plate and against which said rocker members may swing to limit the spacing apart of the rollers, means for shifting said block, a second revoluble cylinder mounted adjacent said block, a plurality of posts carried by the second cylinder adapted to be selectively brought around by revolution of the cylinder to intercept said block in its movement to locate said block at the position required to maintain said rollers in the spaced relation to support the stock, and rotating means interconnecting said two cyl-

inders whereby said cylinders may be simultaneously revolved to direct relatively adjusted posts thereon respectively toward said carrier and said block.

4. In a device for turning a plurality of diameters on a length of revoluble stock by a single tool, a plate, a tool carrier pivotally mounted on the plate, a revoluble cylinder carried by the plate, a plurality of posts carried by the cylinder adapted to be directed one at a time toward said carrier upon rotation of the cylinder whereby the outward swing of the carrier away from the stock may be selectively limited as determined by the lengths of the posts, means for mounting a cutting tool on the carrier, a stock rest comprising a pair of rollers and rocker members carrying the rollers, a slidable block supported from said plate and against which said rocker members may swing to limit the spacing apart of the rollers, means for shifting said block, a second revoluble cylinder mounted adjacent said block, a plurality of posts carried by the second cylinder adapted to be selectively brought around by revolution of the cylinder to intercept said block in its movement to locate said block at the position required to maintain said rollers in the spaced relation to support the stock, and rotating means interconnecting said two cylinders whereby said cylinders may be simultaneously revolved to direct relatively adjusted posts thereon respectively toward said carrier and said block, and cylinder stop means normally retaining said cylinders in selected positions.

5. In a device for turning a plurality of diameters on a length of stock by a single tool, a supporting plate, a tool carrier rockably carried by the plate, a cylinder revolubly carried by the plate to turn about a horizontal axis turned perpendicularly to the axis of rotation of the said carrier, a plurality of posts adjustably extending in parallel arrangement in spaced apart relation from an end of the cylinder, a post contacting member on the tool carrier, said cylinder being mounted in relation to said carrier to carry said posts around into the path of the post contacting member whereby the member may bear selectively against the ends of the posts to limit the outward swing of the carrier from the stock, a stock rest against which the stock may bear while being cut, a shiftable block against which said rest may bear to limit its travel away from the stock, screw means for shifting the block, a second revoluble cylinder adjacent the block mounted on an axis parallel to the direction of travel of the block, a plurality of posts adjustably extending from the rear face of the second cylinder, a post contacting member on said block, said second cylinder posts being located to be brought one at a time selectively into the path of said contacting member by

rotation of the cylinder whereby travel of the block is arrested, and means for bringing said contacting member against the respective posts with a limited pressure.

5 6. In a device for turning a plurality of diameters on a length of stock by a single tool, a supporting plate, a tool carrier rockably carried by the plate, a cylinder revolubly carried by the plate to turn about a horizontal axis turned perpendicularly to the axis of rotation of the said carrier, a plurality of posts adjustably extending in parallel arrangement in spaced apart relation from an end of the cylinder, a post contacting member on the tool carrier, said cylinder being mounted in relation to said carrier to carry said posts around into the path of the post contacting member whereby the member may bear selectively against the ends of the posts to limit the outward swing of the carrier from the stock, a stock rest against which the stock may bear while being cut, a shiftable block against which said rest may bear to limit its travel away from the stock, screw means for shifting the block, a second revoluble cylinder adjacent the block mounted on an axis parallel to the direction of travel of the block, a plurality of posts adjustably extending from the rear face of the second cylinder, a post contacting member on said block, said second cylinder posts being located to be brought one at a time selectively into the path of said contacting member by rotation of the cylinder whereby travel of the block is arrested, and means for bringing said contacting member against the respective posts with a limited pressure, and cylinder rotating means interconnecting said two cylinders whereby the cylinders may be simultaneously revolved.

7. In a device for turning a plurality of diameters on a length of stock by a single tool, a supporting plate, a tool carrier rockably carried by the plate, a cylinder revolubly carried by the plate to turn about a horizontal axis turned perpendicularly to the axis of rotation of the said carrier, a plurality of posts adjustably extending in parallel arrangement in spaced apart relation from an end of the cylinder, a post contacting member on the tool carrier, said cylinder being mounted in relation to said carrier to carry said posts around into the path of the post contacting member whereby the member may bear selectively against the ends of the posts to limit the outward swing of the carrier from the stock, a stock rest against which the stock may bear while being cut, a shiftable block against which said rest may bear to limit its travel away from the stock, screw means for shifting the block, a second revoluble cylinder adjacent the block mounted on an axis parallel to the direction of travel of the block, a plurality of posts adjustably extending from the rear face of the second cylinder, a

post contacting member on said block, said second cylinder posts being located to be brought one at a time selectively into the path of said contacting member by rotation of the cylinder whereby travel of the block is arrested, and means for bringing said contacting member against the respective posts with a limited pressure, and cylinder rotating means interconnecting said two cylinders whereby the cylinders may be simultaneously revolved, and cylinder stop means normally preventing rotation of the cylinders.

8. In a device for turning a plurality of diameters on a length of stock by a single tool, a supporting plate, a tool carrier rockably carried by the plate, a cylinder revolubly carried by the plate to turn about a horizontal axis turned perpendicularly to the axis of rotation of the said carrier, a plurality of posts adjustably extending in parallel arrangement in spaced apart relation from an end of the cylinder, a post contacting member on the tool carrier, said cylinder being mounted in relation to said carrier to carry said posts around into the path of the post contacting member whereby the member may bear selectively against the ends of the posts to limit the outward swing of the carrier from the stock, a stock rest against which the stock may bear while being cut, a shiftable block against which said rest may bear to limit its travel away from the stock, screw means for shifting the block, a second revoluble cylinder adjacent the block mounted on an axis parallel to the direction of travel of the block, a plurality of posts adjustably extending from the rear face of the second cylinder, a post contacting member on said block, said second cylinder posts being located to be brought one at a time selectively into the path of said contacting member by rotation of the cylinder whereby travel of the block is arrested, and means for bringing said contacting member against the respective posts with a limited pressure, and cylinder rotating means interconnecting said two cylinders whereby the cylinders may be simultaneously revolved, and cylinder stop means normally preventing rotation of the cylinders, said stop means comprising a plate guided pin for each cylinder normally entering a hole therein, a lever extending from each pin and fulcrumed over a post to engage a central post adapted to be depressed to rock the levers and shift said pins from the cylinder holes.

9. In a multiple diameter turning device, a shiftable tool holder, a shiftable work support, a plurality of posts for both said holder and said support selectively limiting the movement thereof one away from the other, and means for simultaneously and relatively shifting said posts whereby said holder and said support may be correspondingly shifted

to new cutting diameter positions as determined by the shifted positions of the posts.

10. In a multiple diameter turning device, a shiftable tool holder, a shiftable work support, a plurality of posts for both said holder and said support selectively limiting the movement thereof one away from the other, and means for simultaneously and relatively shifting said posts whereby said holder and said support may be correspondingly shifted to new cutting diameter positions as determined by the shifted positions of the posts, and releasable stop means normally retaining said posts in predetermined positions.

15 In testimony whereof I affix my signature.  
JAMES H. RICHARDSON.

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