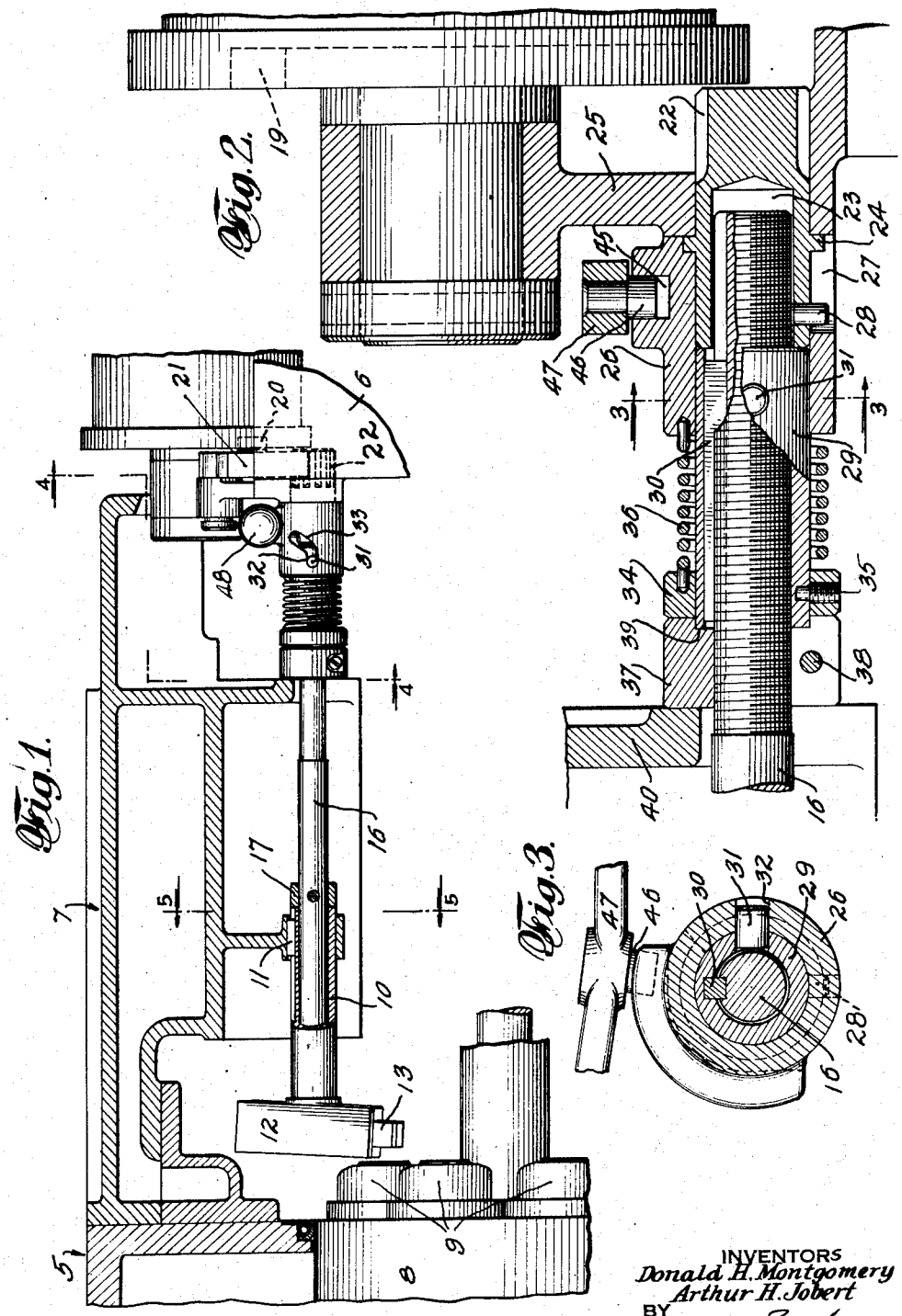
May 17, 1938. D. H. MONTGOMERY ET AL 2,118,014

STOCK STOP

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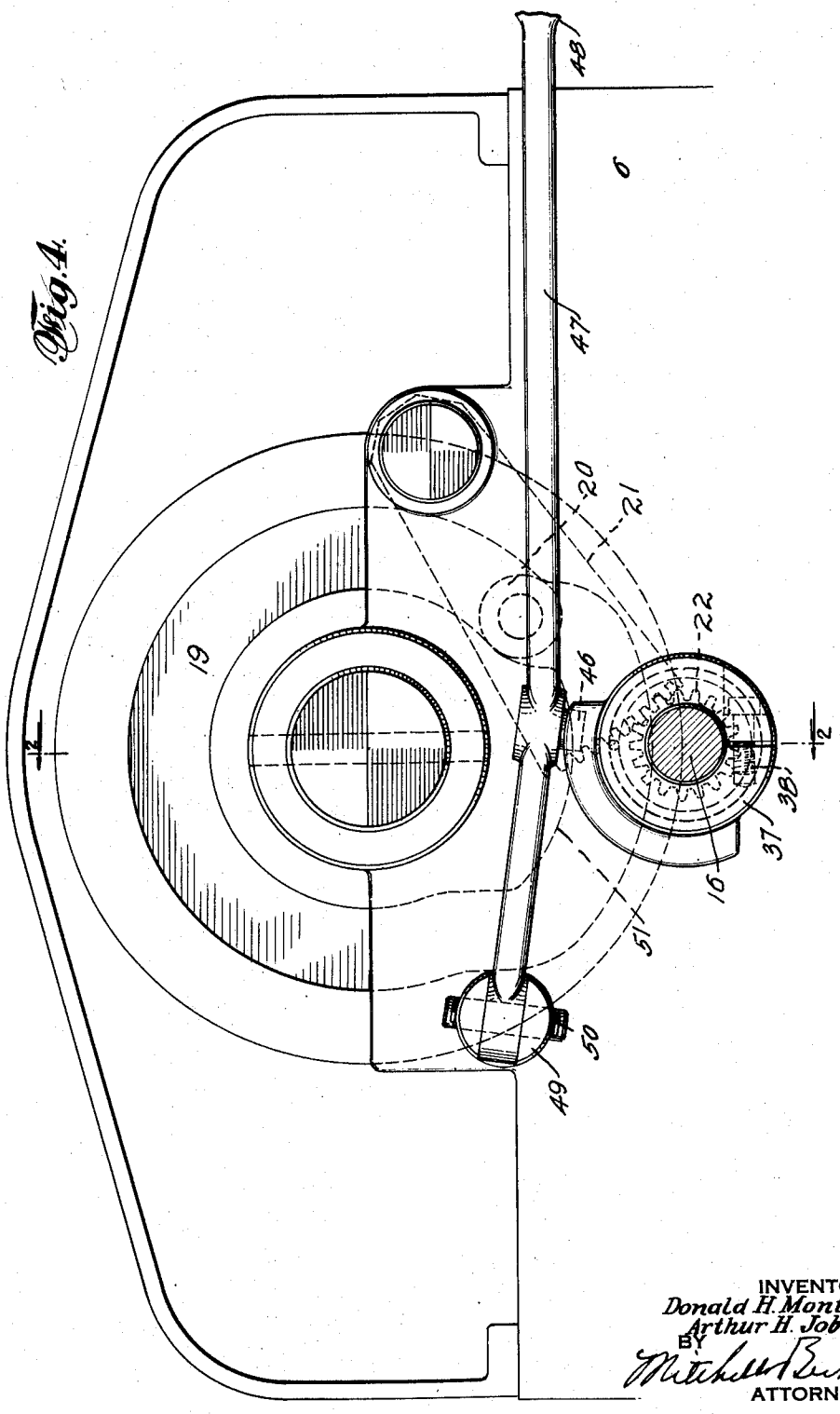
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STOCK STOP

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Fig. 4.



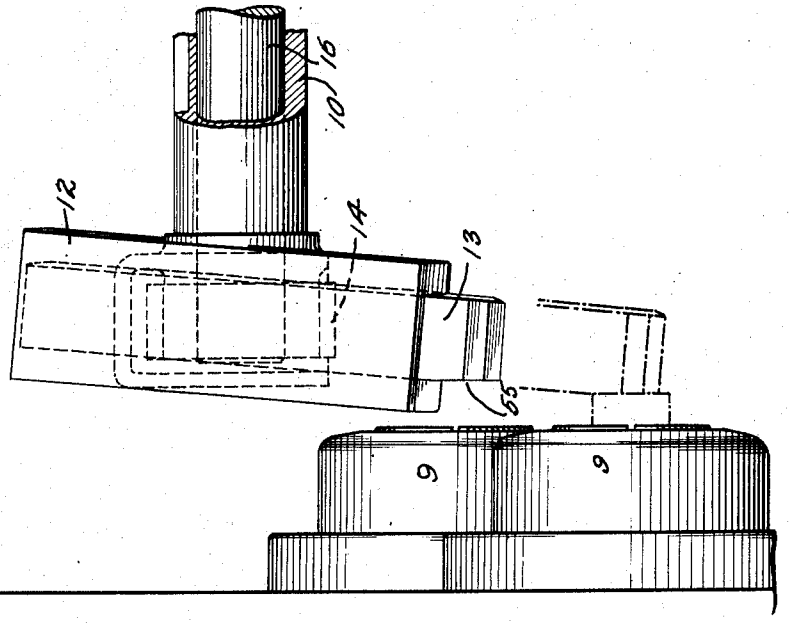
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STOCK STOP

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Fig. 6.



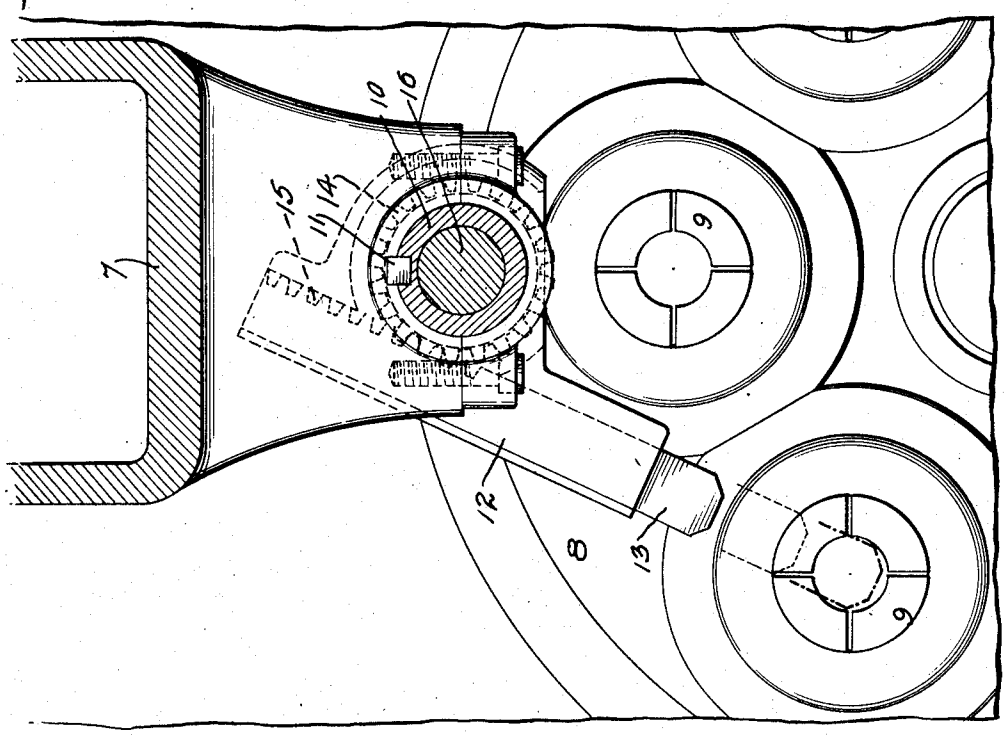


Fig. 5.

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STOCK STOP

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14 Claims. (Cl. 29—37)

Our invention relates to a stock stop.

It is a general object of the invention to provide an improved stock stop.

It is a more specific object to provide a stock stop normally automatically actuated in timed relation with the feed functions of a machine, together with improved means for manually withdrawing the stock stop to permit removal of the butt ends of stock.

It is another object to provide a stock stop normally automatically actuated and having improved manual means for moving the stock stop to withdrawn position to permit ready removal of butt ends of stock, together with means for automatically moving the stock stop to stock stopping position upon release of the manual means.

It is another object to provide a stock stop which is not likely to collect and become fouled by chips.

Another object is to provide a stock stop which is readily moved to withdrawn position without interference with burrs and the like on the stock end.

Other objects and features of invention will be hereinafter set forth or will become apparent to those skilled in the art.

Briefly stated, in the preferred form of the invention we provide a stock stop member which is normally automatically projected into stock stopping position and at the proper time withdrawn to an out-of-the-way position. The stock stopping member is movable by a rotatable shaft and may be of the swinging type but is preferably a normally enhoused stock stopping member which is projected from its housing into stock stopping position. When housed the stock stop member is not likely to collect and become fouled with chips. The actuating shaft is normally automatically actuated and we provide improved mechanism for permitting the stock stop to be manually withdrawn when it has been automatically projected into stock stopping position, so that the butt ends of stock may be removed. We prefer to arrange the mechanism so that, upon release of the manually actuated means, the stock stopping member will be resiliently and automatically recoupled to its automatic drive. The stock stop member is preferably moved in such manner as to cause the least interference with burrs or irregular ends on the stock.

In the drawings which show, for illustrative purposes only, a preferred form of the invention—

Fig. 1 is a fragmentary view in longitudinal section of a multiple spindle bar machine illustrating features of our improved stock stop;

Fig. 2 is an enlarged fragmentary sectional view through the right-hand end of the stop mechanism shown in Fig. 1 and taken substantially in the plane of the line 2—2 of Fig. 4;

Fig. 3 is a sectional view taken substantially in the plane of the line 3—3 of Fig. 2;

Fig. 4 is an enlarged sectional view taken substantially in the plane of the line 4—4 of Fig. 1;

Fig. 5 is an enlarged sectional view taken substantially in the plane of the line 5—5 of Fig. 1; and

Fig. 6 is an enlarged fragmentary view of a spindle carrier and improved stock stop positioned relatively thereto.

Our invention may be applied to various types of machines but will be disclosed herein as applied to a multiple spindle bar machine of the type disclosed in Gridley et al. application, Serial No. 551,136, filed July 16, 1931. In the machine of said Gridley et al. application the frame includes a spindle carrier end 5 and a power case end 6, which are tied together at the top by means of a tie-plate 7. The frame part 5 carries an indexible spindle carrier 8, having a plurality of chucks or collets 9 for the bar stock.

In the particular form shown the tie-plate 7 is provided with a bearing, which slidably receives and supports a sleeve 10 splined therein, as indicated at 11. The sleeve at one end carries a stock stop housing 12 and a stock stop member or finger 13 is slidably mounted in said housing, so as to be projectable therefrom into stock stopping positon (dot and dash lines, Figs. 5 and 6) and withdrawn to an out-of-the-way position, as illustrated in full lines in Figs. 5 and 6. The stock stop member 13 may be moved by means of a pinion 14, meshing with a rack 15 formed or secured to the stop member 13. The pinion 14 is carried by a rotatable shaft 16, rotatable in the sleeve 10 and provided at the right-hand end thereof with a collar 17, rigidly secured to the shaft 16 so that the latter is held relatively to the sleeve and housing 12 by means of the collar 17 and pinion 14 within the housing.

The shaft 16 is normally rotated mechanically in timed relation with the feed functions of the machine. In the form illustrated the stock stop actuation is primarily by a cam 19 and coacting cam roll 20 carried on a pivoted segmental gear 21, which meshes with a pinion 22 carried by the frame of the machine. Thus, when the cam rotates, the segment 21 is rocked so as to rotate or oscillate the pinion 22 to rotate the shaft 16 by means to be described.

The pinion 22 is provided with a bore 23 and

receives the right-hand end of the shaft 16. The pinion 22 has an angularly extending shoulder or collar 24, which abuts against the wall 25 of the power case end of the machine frame and, as will be described, the wall 25 takes the end thrusts transmitted through the stock stop mechanism from the projected stock.

Surrounding the pinion 22 and having a bearing thereon is a sleeve 26, which is axially but non-rotatably movable on the pinion 22 and in the form shown the sleeve is provided with a longitudinally extending slot 27 and a pin 28 secured to the pinion fits in the slot and thus prevents relative rotating movement between the pinion and the sleeve 26. Fitting within the sleeve 26 there is a second sleeve or bushing 29, which abuts the end of the pinion 22 and is splined to the shaft 16 by means of a key 30, so that the shaft 16 may be adjusted longitudinally within the sleeve 29. The sleeve 29 is normally non-rotatably coupled to the sleeve 26 and for that purpose the sleeve 29 is provided with a projecting pin 31, which projects into an axially extending portion 32 of an angular or curved slot 33. Thus, when the pin 31 is in the axial portion 32 of the slot 33 the two sleeves are held positively against rotation.

A collar 34 is fixedly carried by the sleeve 29 and is secured thereto, as by means of a set screw 35. A coil spring 36 is interposed between the collar 34 and the sleeve 26 and the ends of the coil spring are held in apertures in the sleeve and collar, as will be clear from Fig. 2. The spring 36 is at all times under compression, so as to tend to separate the collar 34 and sleeve 26 axially and is under torsional stress, so as to at all times tend to rotate the collar 34 (and shaft 16 keyed to the sleeve 29) relatively to the sleeve 26.

A split adjusting nut 37 is threaded on the shaft 16 and may be securely held in adjusted position by means of a bolt 38 for drawing up on the split nut and causing it to very rigidly grip the shaft 16. The split adjusting nut 37 is preferably slightly counter-bored to receive and support the end 39 of the sleeve 29 and the left-hand end of the adjusting nut 37 abuts the web 40 of the tie-plate 7. It will be seen that with the shoulder 24 of the pinion in engagement with the wall 25 and the adjusting nut 37 in engagement with the web 40 and the sleeve 29 acting as a spacer between the pinion and adjusting nut, all of the parts including the shaft 16 will be securely held against axial movement. It will also be clear that when the bolt 38 is loosened so as to permit rotation of the adjusting nut 37 on the shaft 16, rotation of the nut 37 will serve to shift the shaft 16 to the desired adjusted position. In the position illustrated in Fig. 1 the shaft 16 is substantially at its limit of left-hand movement and the shaft 16 has carried the housing 12, sleeve 18, etc., toward the left with it. In the position shown in Fig. 2 the shaft 16 has been moved almost to its extreme right-hand position.

Now since the pinion 22, sleeve 26, sleeve 29 and shaft 16 are all normally held against relative rotation, when the pinion 22 is rotated by segment and cam the shaft 16 will be rotated, so as to project or withdraw the stock stop member 13.

In the operation of machines of the character indicated the operation of the stock stop member is so timed that it is in stock stopping position (dot and dash lines, Figs. 5 and 6) when the chuck or collet is in loading position and the chuck opened and the bar stock fed forward. When the bar of stock has about run out and it is no longer feasible to make another piece part from the remaining stock, the butt end must be withdrawn and a new bar of stock inserted in the spindle. Since the stock stop 13 is in normally projected position at the time the collet in loading position is open so that the butt end can be removed, we have devised improved means for withdrawing the stock stop so as to permit ready removal of the butt ends of stock. As illustrated, the sleeve 26 is provided with a circumferentially extending slot 45 for the reception of a pin 46, carried by a manually operable lever 47. The lever 47 is provided with a handle 48 at one end and at the opposite end is pivoted to the frame in a forked bearing 49 by means of a pivot pin 50. Now, with the cam 20 riding on the high-dwell portion 51 of the cam, it will be clear that the stock stop member 13 will be in projected position and in the way of the removal of the butt end of stock. However, manual swinging of the lever 48, through the medium of the pin 46 and slot 45, will serve to move the sleeve 26 toward the left. The first movement of the sleeve 26 toward the left will free the pin 31 from the axial or straight portion 32 of the angular slot 33, and further movement of the sleeve will cause the pin 31 on the sleeve 29 to ride up in the angular portion of the slot 33 and cause the sleeve 29 and with it the shaft 16 to rotate in a clockwise direction as viewed in Fig. 5 and in a counterclockwise direction as viewed in Fig. 4. Such rotation further torsionally stresses the spring 36 and the left-hand movement of the sleeve 26 further compresses the same. The rotation of the shaft 16 through the manual handle serves to withdraw the stock stop member 13 to some withdrawn position, preferably to the dotted line position of Fig. 5, so that the butt end of the stock may be removed. During such removal the operator may simply hold the handle to maintain the stock stop member 13 in withdrawn position. When the butt end of stock has been removed the handle 48 is released and the spring 36 then forces the sleeve 26 toward the right and in doing so rotates the sleeve 29 through the pin and slot connection 32—33 and at the same time the tendency of the spring to uncoil further helps to rotate the sleeve 29 and its splined shaft 16 to project the stock stop member 13 onto the path of the new bar of stock to be inserted in the collet in loading position.

It will thus be seen that we have provided a simple means for normally positively locking the stock stop actuating shaft to its automatic mechanical drive and means for very readily rotating the shaft manually relatively to a part of the mechanical drive, so as to withdraw the stock stop. As soon as the manual means is released the stock stop and its actuating mechanism are resiliently moved to normal mechanical operating position.

The stop member 13 and the housing 12 carrying the same in the preferred form are set at a substantial angle to the vertical (Fig. 6) and the stock stopping surface 55 is preferably slabbed off in a vertical plane, so that when the stop member is in stock stopping position the stock may abut against the flat surface thereof. When the stop member 13 is withdrawn it will be seen that, due to angular direction of movement of the member 13, there will be a radial movement away from

the stock and at the same time an axial movement away from the end of the bar, so that there is little likelihood of any interference between the stock stop member 13 and any burr or irregularity which may be on the end of the bar stock. Furthermore, the axial and radial withdrawal of the stock stop avoids the possibility of engagement of the latter by the projecting end of stock during indexing.

It is to be observed that the stop member 13 is projected downwardly and retracted upwardly into the depending housing. The stock stop is therefore in a measure self-cleaning and any chips which might curl up thereon would tend to be stripped off during retraction. With the stock stop extending downwardly chips which might reach the same would tend to fall off and not lodge thereon. The stop 13, when in withdrawn position, is well away from the stock in any of the collets of a multiple spindle machine and there is little likelihood that chips will catch and curl up on the stock stop with consequent danger of feeding short. The stock stop member 13, if it does normally project a short distance as illustrated in Figs. 5 and 6, may be so rounded or in effect stream-lined that it will be very difficult for any chips to lodge or curl up thereon.

While the projecting stop member 13 as illustrated has many advantages it is to be observed that, since it is actuated by a rotatable shaft, as 16, stock stops of other types might readily be employed.

While the invention has been described in considerable detail and a single preferred embodiment shown, it is to be understood that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

We claim:

1. In a stock stop, a housing, a stock stop normally housed therein, and means for projecting said stock stop downwardly from said housing into stock stopping position and retracting the same upwardly into said housing.

2. In a stock stop, a dependent housing, a stock stop member normally housed within said housing, and means for projecting said stock stop member from said housing downwardly into stock stopping position and retracting the same upwardly into said housing.

3. In a stock stop, a stock stop finger adapted to be positioned in stock stopping position for mechanically arresting the feed of stock, and means for withdrawing said stock stop finger by a simultaneous axial and radial movement relatively to the end of the stock to be stopped.

4. In a stock stop, a stock stop finger, means for moving the stock stopping portion thereof away from the end of the stopped stock with a simultaneous radial and axial motion relatively to the stock to be stopped.

5. In a stock stop, a stock stop finger, a rotatable shaft for moving said stock stop finger, actuating means for said shaft, means for releasably but positively locking said actuating means and said shaft for joint rotation, and resilient means for holding said shaft and actuating means in positively locked engagement.

6. In a stock stop, a stock stop member, a rotatable shaft for moving the same, actuating means for said shaft, means for normally positively locking said shaft and actuating means together, and resiliently resisted means for unlocking said actuating means and shaft and rotating said shaft relatively to said actuating means, for the purpose described.

7. In a stock stop, a stock stop member, a rotatable shaft for moving the same, resilient means for moving said stock stop member to stock stopping position, and means for positively withdrawing said member from stock stopping position.

8. In a stock stop, a stock stopping member, a rotatable shaft for moving the same, actuating means for normally actuating said shaft, means for manually moving said shaft independently of said actuating means, and means including a spring for automatically coupling said actuating means and said shaft to each other upon release of said manual means.

9. In a stock stop, a stock stopping member, a rotatable shaft for moving the same, actuating means for rotating said shaft comprising a gear and pinion, means for moving said actuating means in timed relation with the feed functions of a machine embodying said stock stop, means for manually uncoupling said shaft from driving relationship with said actuating means and moving said shaft and stock stop, and automatic means for coupling said actuating means and said shaft upon release of said manual means.

10. In a stock stop, a stock stop member, a rotatable shaft for moving the same, actuating means for said shaft including a coupling means, and means for manually moving said coupling means longitudinally of said shaft to rotate said shaft, for the purpose described.

11. In a stock stop, a stock stopping member, a rotatable shaft for moving the same, gear means normally non-rotatably coupled to said shaft for rotating the same, means for manually rotating said gear means and shaft relatively to each other for rotating said shaft, and resilient means for rotating said shaft and gear means to normally couple the same in driving relationship.

12. In a stock stop, a stock stop member, a rotatable shaft for moving the same, a drive member for said shaft and normally coupled in driving relationship therewith, and manual means for varying the angular position of said driving member and said shaft while maintaining said driving member stationary for actuating said stock stop member manually.

13. In a stock stop, a stock stop member, a rotatable shaft for moving the same, actuating means for said shaft for projecting said stock stop member into stock stopping position, manual means for withdrawing said stock stop member, and resilient means for projecting said stock stop member upon release of said manual means.

14. In a device of the character indicated for use with a spindle carrying bar stock adapted to be fed therethrough, a reciprocable stock stop movable into position to mechanically stop a bar of stock fed through the spindle, guide means for reciprocally guiding said stock stop, said guide means being set to reciprocally guide said stock stop in a path at an acute angle to a transverse plane at right angles to the axis of the bar stock, whereby said stock stop will be guided in its reciprocable movement in a direction having a simultaneous axial and radial component relatively to the axis of the bar stock, and means for moving said stock stop into and out of stock stopping position.

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