April 25, 1950 F. H. McCLERNON 2,505,684

TOOLHOLDER

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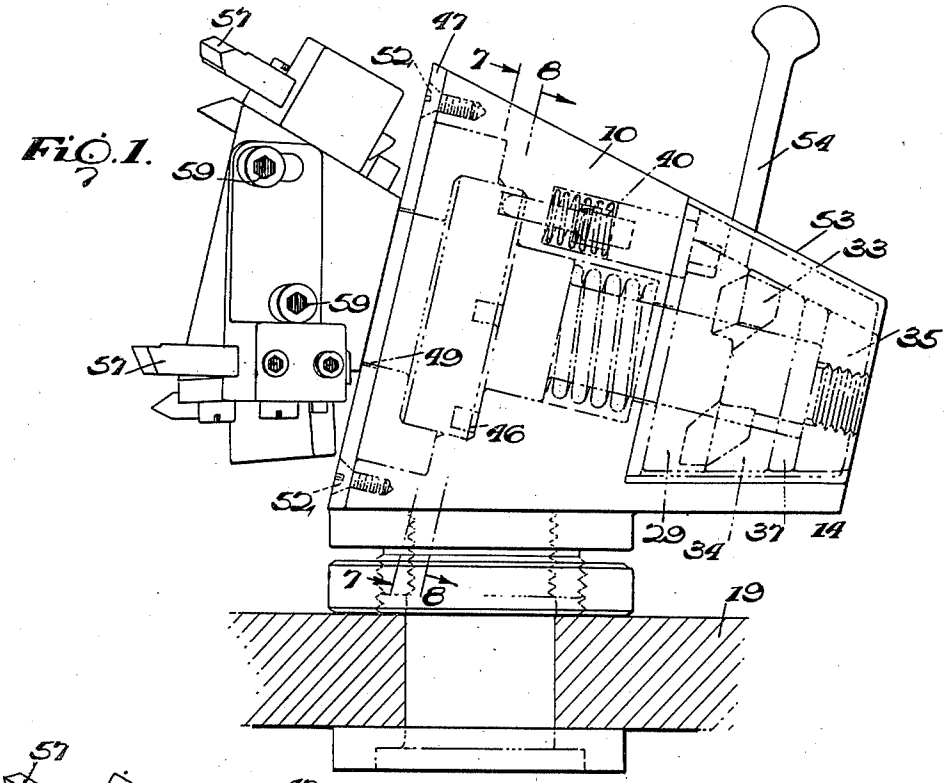



Fig. 1.

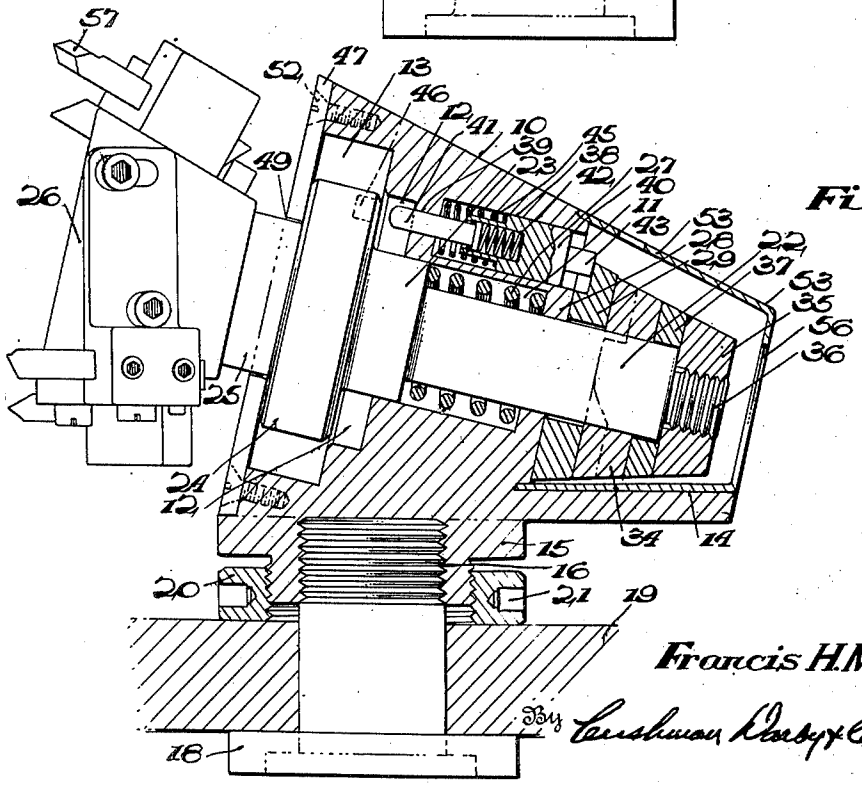



Fig. 2.

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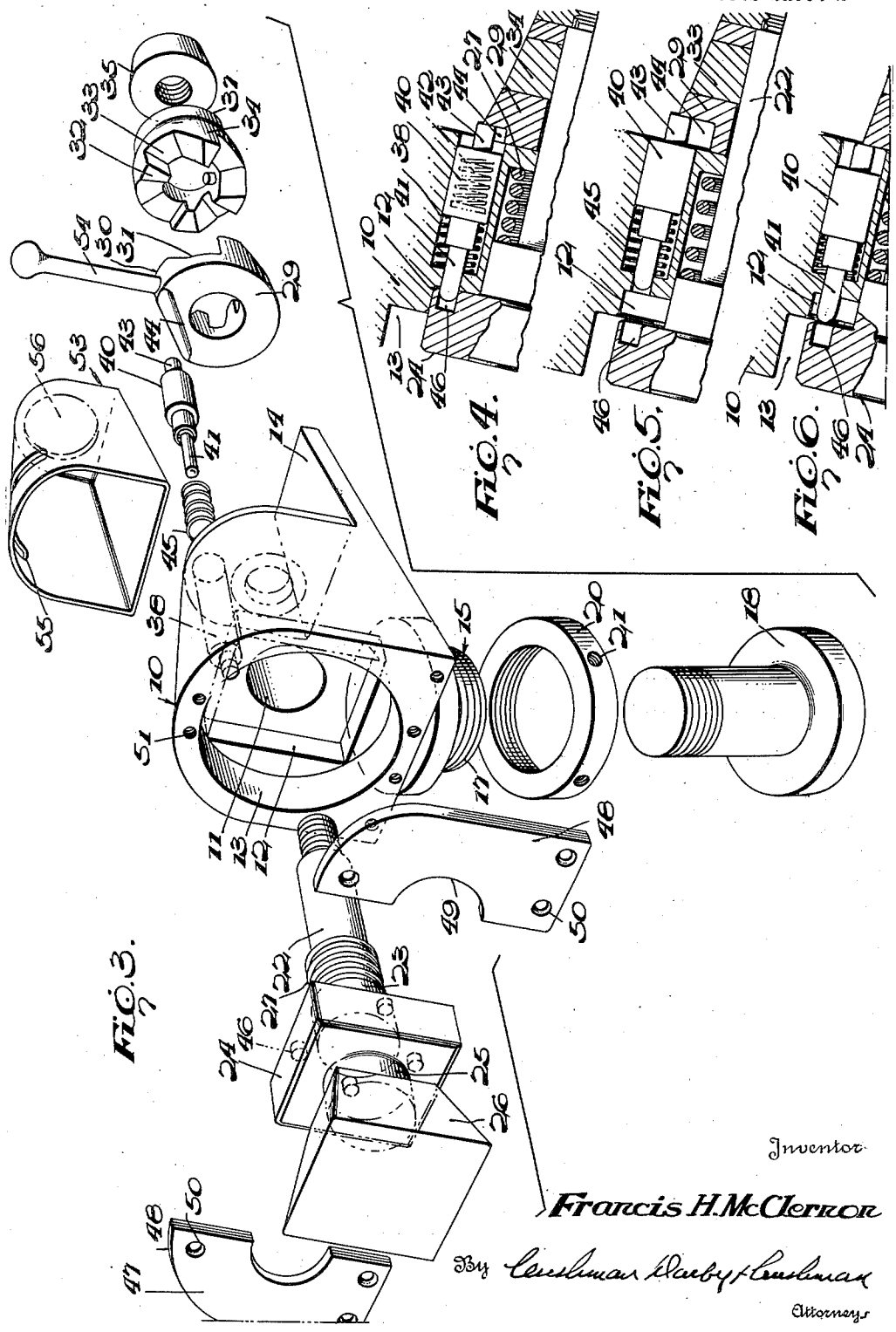


FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

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Fig. 7.

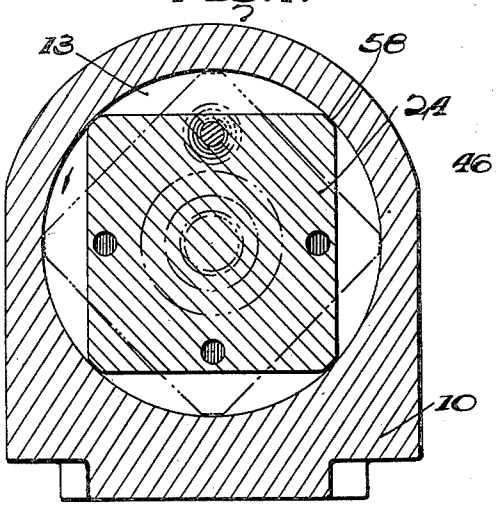



Fig. 8.

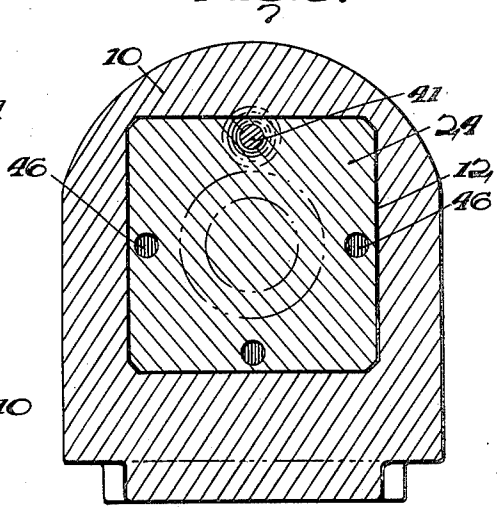



Fig. 9.

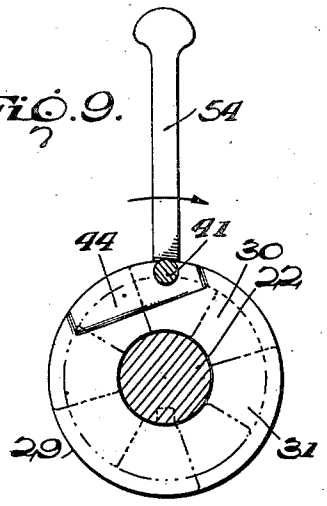



Fig. 10.

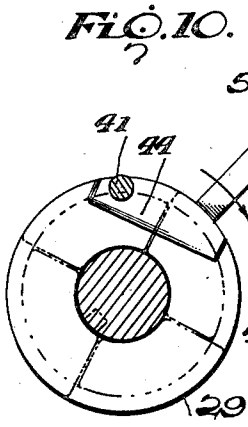



Fig. 11.

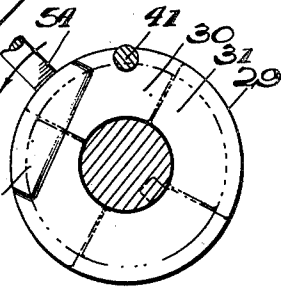



Fig. 9a.

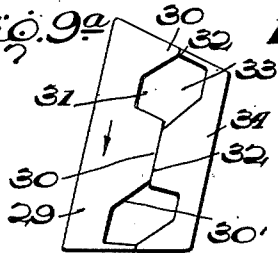



Fig. 10a.

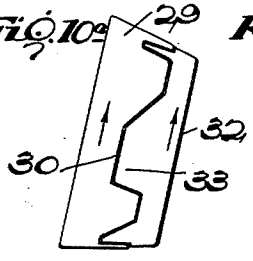
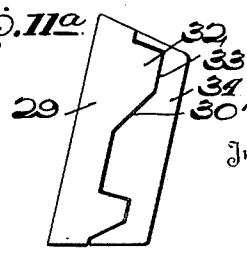



Fig. 11a.




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FIG. 12.

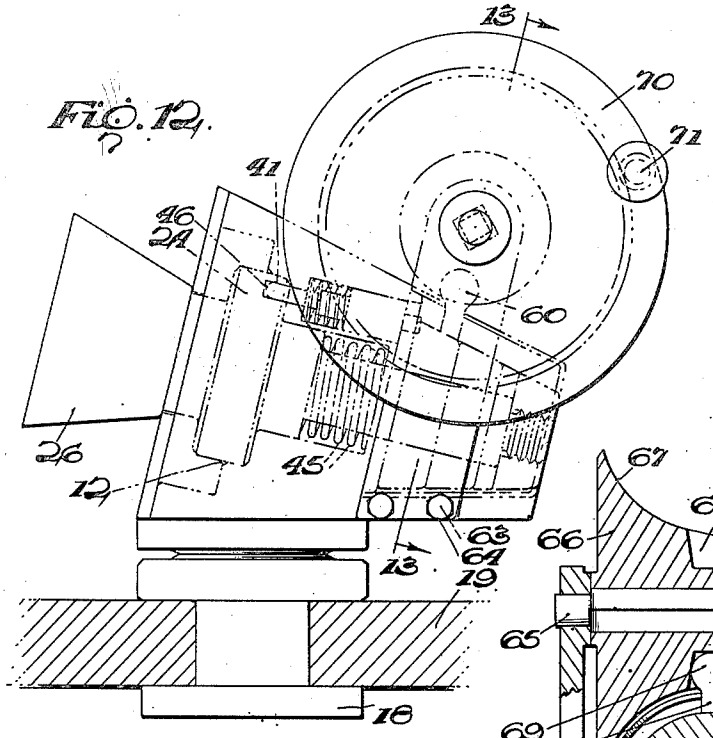



FIG. 13.

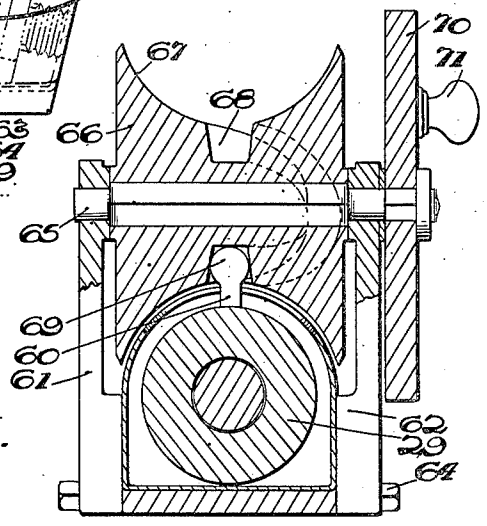



FIG. 15.

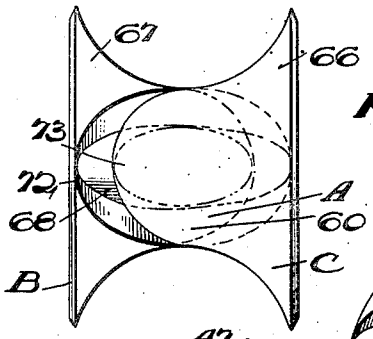
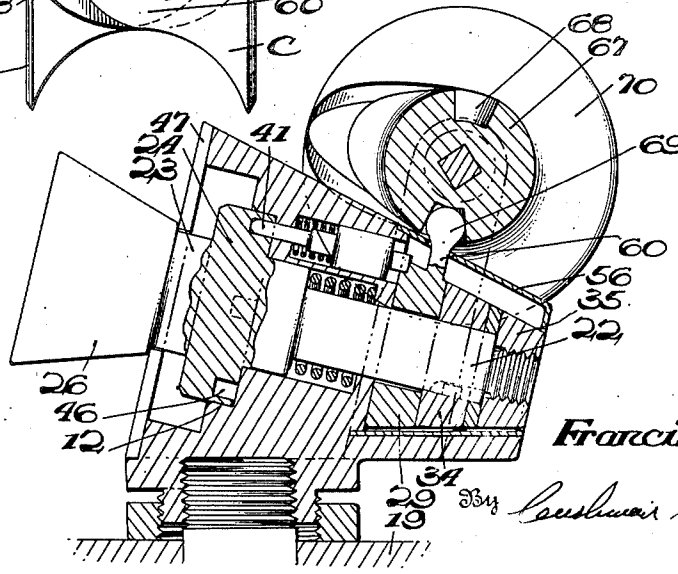



FIG. 14.




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FIG. 16.

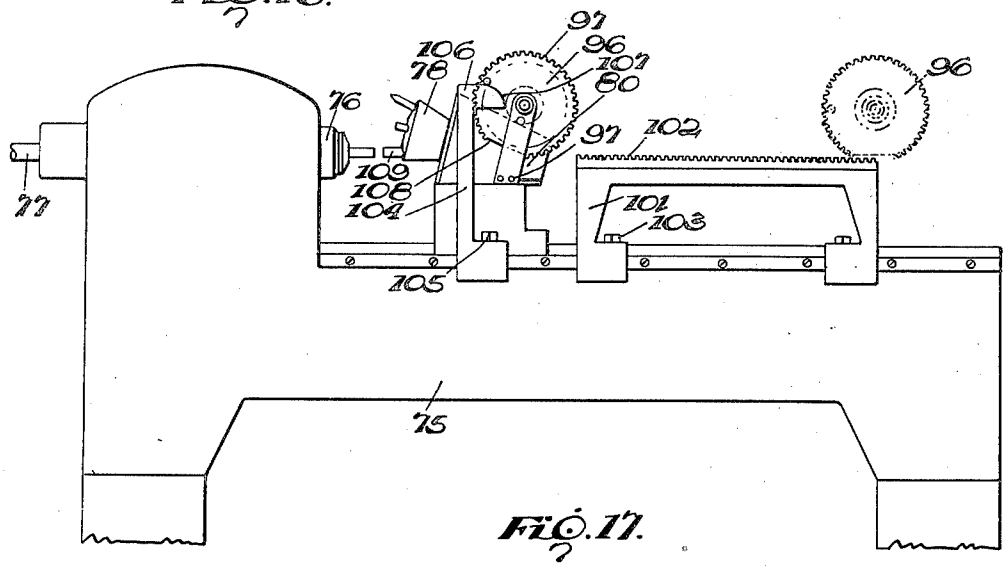



FIG. 17.

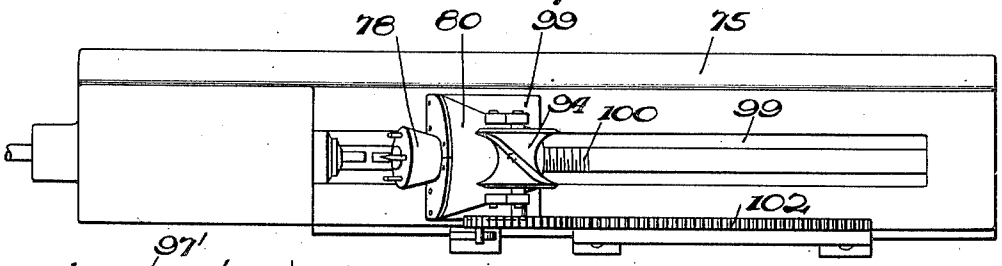



FIG. 18.

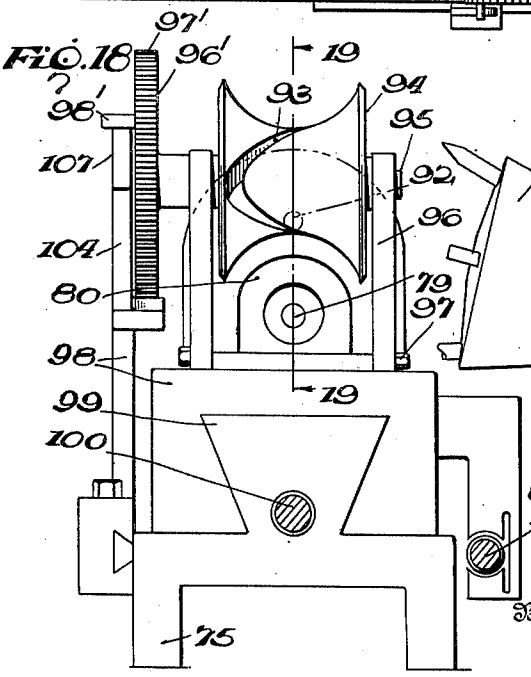
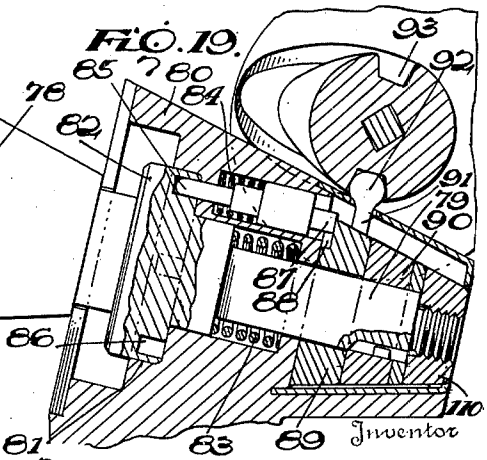



FIG. 19.




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Patented Apr. 25, 1950

2,505,684

# UNITED STATES PATENT OFFICE

2,505,684

## TOOLHOLDER

Francis H. McClernon, Springfield, Mo.

Application March 9, 1944, Serial No. 525,727

6 Claims. (Cl. 29—49)

1

The present invention relates to lathe turrets and more particularly to improved means for moving and maintaining a tool head or holder in proper position relative to the work.

An important feature of the invention consists in providing simple, efficient and economical means for successively or intermittently positioning a plurality of cutting or shaping tools in operative alignment with the work, said means including a rotatable and axially movable multiple tool head or holder having associated therewith a releasable locking means for maintaining the head in a fixed position. Operatively associated with the tool head and locking means in a clutch mechanism which normally maintains the tool head in a fixed position relative to the work and which is arranged when rotated in one direction to move the tool head away from the locking means. When the clutch mechanism is moved in an opposite direction it acts to turn the tool head so as to present a new tool to the work, and when the tool head is rotated a predetermined distance the locking means is brought into operation to stop the rotation of the head. The clutch mechanism and its associated parts are then returned to their initial position and the clutch mechanism during this return movement causes the tool head to be moved inwardly relative to the locking means so as to maintain the new tool in proper and fixed alignment with the work.

A further object consists in providing the turret housing with a seat or shoulder portion arranged to receive a revolving head rest member so as to provide a firm base for supporting the tool holder during the drilling or cutting operation.

Another object is to provide means for actuating the clutch mechanism so as to present tools of different types to the work, without the necessity of removing the tools from the holder, said means being manually operable and arranged to be connected to automatic or semi-automatic instrumentalities for controlling the position of the tool head.

A further object consists in providing a revoluble member which is operatively connected to the clutch actuating means so that upon each revolution of the revoluble member, the tool in alignment with the work is moved away therefrom, and the holder is turned to present a new tool to the work.

Other objects and advantages of the invention will become apparent from the following

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description when taken in conjunction with the accompanying claims and drawings.

In the drawings:

Referring to the drawings in which are shown several preferred embodiments of the invention.

Figure 1 is a side elevation with parts in section of my improved lathe turret mounted on a suitable support,

Figure 2 is a vertical longitudinal sectional view of Figure 1,

Figure 3 is an exploded view showing parts of the turret disassembled,

Figures 4, 5 and 6 are detail sectional views showing the different positions of the locking or indexing finger during the operation of the turret,

Figure 7 is a vertical sectional view taken substantially along line 7—7 of Figure 1,

Figure 8 is a sectional view taken substantially along line 8—8 of Figure 1,

Figures 9, 9*a*, 10, 10*a*, 11 and 11*a* are detail views of the clutch mechanism and its associated parts showing different positions they assume during the operation of the turret,

Figure 12 is a detail view of the modified form of the invention showing the turret and clutch mechanism associated with semi-automatic operating means,

Figure 13 is a sectional view taken substantially along the line 13—13 of Figure 12,

Figure 14 is a vertical sectional view of Figure 12,

Figure 15 is a detail view of the revolving drum and diagrammatically shows the path of movement of the operating lever,

Figure 16 is a side view of a lathe showing automatic operating means for actuating the clutch mechanism and its associated parts,

Figure 17 is a plane view of Figure 16,

Figure 18 is an end view of Figure 16, and

Figure 19 is a vertical sectional view of the turret and operating means shown in Figure 16.

The improved lathe turret comprises a turret housing or tool head support 10 which has a longitudinally centrally disposed bore 11 (Fig. 3) provided at its front or forward end with an enlarged substantially square shaped seat portion 12 of substantial area that terminates in an annular end portion 13. The housing adjacent the inner end of the bore 11 is formed with a cut-out flat portion 14. Extending from the bottom of the housing is a hollow lug 15 which is internally threaded as at 16 and externally threaded at 17. A threaded supporting bolt 18 may be arranged to extend through an opening in the bed 19 of the lathe (Fig. 2) and is threadably

connected to the lug 15 so as to firmly secure the housing 10 and its associated parts in a fixed position. An internally threaded compensating nut 20 is connected to the external threads 17 and may be actuated by a suitable tool inserted in the openings 21 to take up any amount of play between the bolt 18 and the lug 15 so as to insure the housing being firmly secured to its support.

A shaft 22 extends through the bore 11 so as to be rotatably mounted in the housing 10 and is provided with an enlarged annular shoulder portion or sleeve 23 to which is suitably connected a revolving head rest member 24 which is substantially square so as to fit within and engage the portion 12 of the housing. Extending outwardly from the member 24 is a cylindrical portion 25 to which the tool head 26 is connected so as to rotate and be movable with the shaft 22. The member 24 and the holder 26 may be formed in one piece or separately, but both are fixed to the shaft to be moved therewith. The seat portion 12 and the member 24 may be of any desired shape to provide a base or foundation so as to insure the tool head being properly supported during the operation of the turret. The member 24 preferably is located close to the front end of the housing 10, thus providing greater leverage at the rear end of the shaft, and serves to reduce vibration when the work is brought in contact with the tool as well as to provide proper balance. A compression spring 27 surrounds the shaft 22 and is confined between the shoulder 23 and the end wall 28 of the housing so as to urge the member 24 and holder 26 away from the housing. On the portion of the shaft 22 which extends into the cut-out portion 14 of the housing there is mounted suitable operating means referred to as a clutch mechanism which preferably comprises an engaging clutch member 29 loosely mounted on the shaft 22 and is formed with one or more flat projections or teeth 30 and recesses 31 which are arranged to engage and interfit with complementary formed projections 32 and recesses 33 in a receiving clutch member 34 which is keyed or otherwise non-rotatably secured to the shaft. The flat projections on the clutch members are preferably separated from their adjacent recesses by inclined portions 30'. An adjusting nut 35 is connected to the reduced threaded end 36 of the shaft and bears against a washer 37 which engages the clutch member 34 so as to maintain the parts of the clutch mechanism in proper operative position. The engaging clutch member 29 is positioned between the end wall of the housing or support 10 and the receiving clutch member 34, so that the housing constitutes an abutment for limiting the axial movement of the engaging member 29 in one direction while the fixed clutch member 34 limits the axial movement of the engaging member in an opposite direction.

The housing 10 has a longitudinal opening 38 extending therethrough and preferably positioned above and parallel with the bore 11 and which has a reduced port 39 which communicates with the portion 12 of the housing. Mounted in the opening 38 is a movable locking or indexing member 40 in which is positioned a pin 41 that is urged outwardly into the portion 12 and against the adjacent surface of the member 24 by a spring 42. Extending outwardly from the opposite end of the member 40 is an integral pin or projection 43 which is arranged to fit into a groove 44 in the adjacent face of the clutch member 29. A coil spring 45 surrounds the pin 41 and is confined between the wall of the housing and a shoulder on the member 40 so as to coact with the spring 42 for urging the pins 41 and 43 outwardly in opposite directions. The inner surface of the member 24 has one or more spaced openings or holes 46, which as the shaft 22 is rotated, are arranged to be successively engaged by the pin 41 to prevent further rotation of the shaft 22 and the head 26. As shown, four openings 46 are provided which are spaced 90° apart to allow the shaft 22 to make a quarter turn before being stopped and the number of these openings correspond to the number of different types or sizes of tools carried by the head. The pin 41 and its associated parts constitute a releasable stop means for arresting the turning movement of the tool turret 26 when the latter rotates a predetermined distance, so as to present a new tool to the work.



In order to prevent dirt and other foreign matter from entering the front end of the housing 10, a closure plate 47 is provided. This plate may be composed of two sections 48 (Fig. 3) having a central opening 49 through which the shaft 22 extends. The sections 48 are also formed with holes 50 which register with complementary threaded holes 51 in the outer face of the portion 13 and receive the threaded bolts 52 to secure the plate 47 to the housing. The clutch mechanism is enclosed in a casing 53 which is shaped to conform to the curvature of the housing and is arranged to rest on the end portion 14 and be suitably secured thereto so as to prevent foreign matter from entering the clutch mechanism. The engaging clutch member 29 is provided with suitable manipulating means such as the handle or lever 54 which extends through a transverse slot 55 in the casing 53 so as to be conveniently, manually actuated or be connected to suitable instrumentalities for automatic operation. The outer end of the casing 53 may be provided with an opening 56 to permit convenient access to the nut 35 when it is desired for any reason either to adjust the clutch mechanism or remove the same.

Normally, the clutch mechanism assumes the position shown in Figs. 1, 9 and 9a with the projections or teeth 30 and 32 in engagement and the recesses 31 and 33 spaced from each other. In this position, the clutch mechanism acts to compress the spring 27 and to maintain the head rest member 24 in engagement with its correspondingly shaped seat portion 12 of the housing, to provide a solid and firm foundation for supporting the outer end of the shaft and the tool holder 26. The pin 43 on the locking means 40 now extends into the recess 44 (Fig. 4) on the clutch member 29 while the opposite end of pin 41 fits into the adjacent opening 46 to maintain one of the tools 57 in proper alignment with the work. The projections 30 are of sufficient length to provide a flat contacting surface which will coact with the head rest member 24 to maintain the tool head and its associated parts securely in position relative to the work. When it is desired or necessary to present a new tool to the work, the handle 54 is first moved clockwise to bring the projections 30 thereof in engagement with the adjacent recesses 33 in the clutch 34 (Figs. 10 and 10a). When this takes place, the tension of the compression spring 27 is released so that the shaft 22 is moved axially and the head rest member 24 is moved away from its seat portion 12 into the portion 13 (Fig. 2). At the same time, the pin 41 is released from

engagement with its adjacent opening 46 (Fig. 5). The clutch engaging member 29 is now locked to the shaft 22 and upon moving the handle 54 in a counter-clockwise direction (Figs. 11 and 11a), shaft 22 together with the member 24 and tool head 26, are rotated a quarter of a revolution. The pin 43, during this movement, passes out of the recess 44 and yieldably engages the flat surface of the clutch 29 (Fig. 6) which forces the locking member inwardly and causes the pin 41 to bear against the adjacent flat surface of the member 24 until it registers with the next opening 46. When this occurs, the pin is forced into the opening by the compression of the springs 38 and 42 so as to prevent further rotation of the tool head 26 and present a new tool in proper alignment with the work. The handle 54 and clutch mechanism are then returned to their normal or initial position to bring the adjacent flat teeth in contact with each other and to move the shaft 22 together with the member 24 and tool holder 26 inwardly so that the member 24 firmly rests against the seat portion 12. When the return movement of the clutch mechanism is initiated, the inclined portions 30' on the clutch members ride up the adjacent fixed inclines on the clutch member 34 so as to force the clutch member 34 away from the clutch member 29 and move the supporting member 24 in engagement with its seat portion 12. This movement also compresses the spring 27. The projections 30 are now brought into engagement with the projections 32 so as to maintain the parts in proper operative position. Preferably, the corners of the portion 12 of the housing and the member 24 are cut or rounded as at 58 (Fig. 7) so as to eliminate sharp corners and to facilitate smoothness of action of the member 24 when being moved into and out of engagement with its seat portion 12. The clutch mechanism and its associated parts now assume the position shown in Figs. 1, 9 and 9a and upon repeating this operation the tool head may be moved a quarter turn to present a new tool in proper position relative to the work. The spaced tools 57 are shown connected to the sides of the head by the clamping means 59. However, it will be clear that these tools may be attached to the front of the head in any suitable manner so as to be successively or intermittently presented to the work.

In the modifications shown in Figs. 12, 13, 14 and 15, the parts of the turret lathe are substantially similar in construction and operation to those previously described. However, instead of providing a manually operating handle for moving the clutch mechanism, a manipulating lever 60 is connected to the engaging clutch 29 and has associated with it means for semi-automatically turning the tool head 26 to present a new tool in alignment with the work. In order to effect this semi-automatic operation, the housing 16 has secured to opposite sides thereof, the spaced arms 61 and 62 (Fig. 13) by the threaded bolt 63 and the nuts 64. A transverse shaft 65 is journalled in the upper ends of the arms 61 and 62 and has secured thereto a drum or revoluble member 66 which is provided with a concave surface 67. The periphery of the surface 67 is formed with a groove 68 in which extends the head 69 of the lever 60. This groove is so shaped that when the clutch mechanism is in its normal position with the flat faces of the teeth in engagement and the head rest member 24 moved against its seat 12, the lever 60 will assume the position as shown in Fig. 13 and be located substantially centrally of the surface 67. To one end of the shaft 65 is connected a wheel 70 having a knob or handle 71 which is arranged to rotate the drum 66 so as to provide a semi-automatic operation of the tool holder and its associated parts. The configuration of the groove 68 is such that upon a complete rotation of the drum 67 by the actuation of the wheel 70, the lever 60 is first moved from its neutral position A (Fig. 15), in a clockwise direction through an arc of substantially 45° to the position B (Fig. 15) so as to move the clutch members 30 and 34 from the position shown in Fig. 9a to that disclosed in Fig. 10a so as to release the compression of spring 45 to move the member 24 away from the locking pin 41 during the first quarter turn of the drum 67. The clutch members 29 and 34 are now locked together and as the drum continues to rotate, the lever 60 is returned to its neutral or central position and then proceeds in a counter-clockwise direction through an arc of 45° to the position C (Fig. 15). During this movement, the shaft 22 and tool holder 26 are moved a quarter turn to present a new tool to the work. The drum 66 has now rotated ¾ of a revolution and as it completes a full revolution, the lever 60 is returned to its central position A which causes the actuation of the clutch mechanism to move the member 24 in engagement with its seat 12 so as to support the tool head firmly in position during the operation of the device. Thus, it will be seen that upon each revolution of the drum 67 a new tool is moved to contact with the work.



In the modification shown in Figure 16, automatic means are provided for actuating the clutch mechanism in order to present a new tool to the work. In this form of the invention, the turret lathe 75 is provided with the usual chuck or work holder 76 revolubly mounted on an operating shaft 77 which is connected to any suitable driving mechanism not shown. The tool holder 78 is connected to the shaft 79 revolubly mounted in the housing 80. The housing 80 is formed with a substantially square portion 81 which constitutes a seat or support for the member 82 on the shaft 79. A spring 83 surrounds the shaft 79 and is confined within the housing so as to urge the member 82 away from and out of engagement with its seat portion 81. Yieldable stop means 84 is provided with a pin 85 at one end arranged to fit in the spaced openings 86 in the member 82 as the latter is rotated, so as to present a new tool to the work. The opposite ends of the locking means 84 has a pin or projection 87 which normally engages in a recess 88 in the clutch engaging member 89 that is loosely mounted on the shaft 79. A receiving clutch 90 is associated with the clutch 89 so as to control the rotation of the tool head 78 and its associated parts in substantially the same manner as shown in the forms of the invention previously described.

An operating lever 91 is connected to the clutch 89 and has a knob or head 92 engaging in a groove 93 of a drum 94. The drum 94 is mounted on a shaft 95 carried by the arms or standards 96 which are secured as at 97 to the sides of the turret. The turret housing 80 and its associated parts are preferably carried on a movable base 98 (Fig. 18) which is slidably mounted on a support 99 and may be moved toward and away from the work chuck 76 in any suitable manner such as by the screw shaft 100.

The shaft 95 is connected to a wheel 96' having

teeth 97' in its periphery and a lug 98' extending from one side thereof. A stationary rack 101 having teeth 102 is clamped as at 103 to one side of the lathe bed 75. A fixed bracket or arm 104 is also secured to the lathe as at 105 and has its upper end provided with a head 106 having a curved portion 107 which is arranged to engage the lug 98' on the wheel 96' when the tool holder is in its cutting or shaping position. The teeth 97' on the wheel 96' are interrupted at 108 for a purpose which will subsequently be described.

In operation, the tool holder 76 and its associated parts are maintained in a fixed position by the clutch mechanism and the member 82 so as to maintain one of the tools 109 carried by the front of the holder, in proper position relative to the work. When it is desired or necessary to present a new tool to the work, the screw 100 is rotated to move the support 99 and the housing 80 to move the teeth 97' on the wheel 96' in engagement with the teeth 102 on the adjacent end of the rack 101. As the turret housing continues its movement to the opposite end of the rack, the wheel 96 is rotated so as to make a complete revolution and as it does, the lever 92 on the clutch 89 is moved to release the member 82 from its seat and to rotate the holder 78 to present a new tool in alignment with the work. The locking means 84 as the member 82 rotates, is forced into engagement with an adjacent opening 86 to prevent further rotation of the head 78 in substantially the same manner as described in the previous forms of the invention. The turret housing 80 and the wheel 96, together with their associated parts, are then returned to the work by suitable means such as the return screw 112, and the lug 98' is caused to ride on the curved surface 107 of the arm 104 to turn the wheel 96 in order to move the interrupted portion 108 to a position to insure the teeth 97 being located to engage the rack teeth 102 when the turning operation is repeated. The frictional engagement of the clutch members 89 and 90 which are firmly and adjustably mounted on the shaft 79 by the nut 110 act to maintain the wheel 97 and its associated parts in a stationary position when the latter is not engaged with the rack 101. Thus, automatic means are provided for moving the tool holder a quarter turn during each complete revolution of the drum 94 and wheel 96 so as to present a new tool to the work and maintain the holder in proper operative contact with the work.

It will be seen that in all forms of the invention, the clutch mechanism is operatively associated with the tool head and the locking means to normally maintain the tool in a fixed position during the cutting or drilling operation, and which allows a new tool to be presented to the work by the simple expedient of either manually or automatically actuating the clutch mechanism. Moreover, one or more tools which may be required to complete the work can be carried by the holder without the necessity of removing the tools from the holder. The rest member is supported by the housing and is positioned close to the tool head or front part of the turret, in order to provide a firm and solid foundation for maintaining the tools in a fixed position when in operation, and also serves to reduce vibration and wear on the parts. The clutch mechanism is constructed and arranged to be operable either by hand, automatically or semi-automatically and insures the proper alignment of each tool with the work at a minimum expenditure of time and effort. While the turret has been shown and described as arranged to be moved outwardly away from its seat, it will be manifest that the rotation of the turret head and the axial movement of the shaft 22 may be reversed so as initially to be moved inwardly and be retracted in its motion, depending upon the particular type of work the turret is to be used with.



Moreover, the turret is adapted to be associated with any type of metal or wooden lathe for cutting, drilling or reaming work to the desired shape, without the necessity of removing the turret from the lathe or changing the tools between each operation. The various parts are constructed and arranged to give proper balance to the turret in order to obtain maximum efficiency in operation, and are readily accessible for inspection or repair.

It will be understood that the several forms of the invention shown and described are merely illustrative of preferred embodiments, and that such changes may be made as fall within the purview of one skilled in the art without departing from the spirit of the invention and the scope of the claims.

I claim:

1. In a lathe turret, the combination of a housing having a seat portion, an axially movable shaft revolubly mounted in said housing and having a multiple tool head at one end thereof arranged successively to present the tools to the work, spring means normally urging the tool head away from the housing, a rest member fixed to the shaft and arranged to engage said seat, releasable stop means carried by the housing, said rest member having spaced openings arranged to receive the stop means when moved in alignment therewith, a clutch mechanism including a clutch engaging member loosely mounted on the shaft and operatively connected to the stop means, and a receiving clutch member keyed to the shaft, said clutch members having opposed flat and recessed portions, the flat portions being normally in engagement to maintain said rest member in contact with said seat, and means for actuating the clutch mechanism, so that upon the engaging member being moved in one direction to move the flat portions in engagement with the adjacent recess portions and release the spring means to move the head away from the housing and the stop means, said clutch mechanism when moved in an opposite direction rotating the shaft and tool head, said stop means when the shaft rotates a predetermined distance engaging one of the openings to prevent further movement of the shaft, said clutch engaging member when the clutch mechanism is returned to its normal position actuating the clutch receiving member and the shaft to move the tool holder in engagement with said rest member.

2. In a machine of the class described, the combination of a fixed support, a revoluble and longitudinally movable shaft on said support, a multiple tool head fixed to one end of said shaft, spring means for moving the shaft away from the support, stop means carried by said support and arranged to lock the tool head at a predetermined point to prevent rotation thereof so as to maintain a new tool in alignment with the work, yieldable means for urging the stop means away from the tool head, operating means including an engaging member loosely mounted on the shaft and a receiving member fixed to the shaft, said engaging member being positioned between the fixed support and the receiving member, said support constituting an abutment for limiting the

axial movement of the engaging member in one direction and the receiving member limiting the axial movement of the engaging member in an opposite direction, said members having opposed projecting portions and recessed portions, means operatively connecting the engaging member to said stop means for moving the stop means toward the tool head and against the tension of the yieldable means, the rotation of the engaging member to bring the projections thereon in engagement with the projections on the receiving member, moving the shaft and tool head inwardly toward the support to tension the spring means and maintain the tool head in a fixed operative position relative to the work, and the turning of the engaging member to move the projections thereon into the recessed portions on the receiving member, releasing the tension of the spring means so that the latter moves the shaft and tool head away from the support, and means for rotating the engaging member to move the projecting portions and the recessed portions thereon into and out of engagement with the projecting portions and the recessed portions on the receiving member.

3. In a machine of the class described, the combination of a fixed support, a revoluble and longitudinally movable shaft extending through said support, a tool head fixed on one end of said shaft, said tool head having spaced openings on one side thereof, releasable stop means mounted on the support and arranged to be moved into one of said openings to arrest rotary movement of the tool head, yieldable means for moving the stop means away from the tool head, spring means associated with said shaft for moving the tool head away from the support, operating means including an engaging member loosely mounted on the shaft and a receiving member fixed to said shaft, said engaging member being positioned between the fixed support and the receiving member, said support constituting an abutment for limiting the axial movement of the engaging member in one direction and the receiving member limiting the axial movement of the engaging member in an opposite direction, said members having opposed projecting portions and recessed portions, means operatively connecting the engaging member to said stop means for moving the stop means toward the tool head and against the tension of the yieldable means, the rotation of the engaging member to bring the projecting portions thereon in engagement on the projection on the receiving member, moving the shaft and tool head inwardly towards the support to tension the spring means and maintain the tool head in a fixed operative position relative to the work, and the turning of the engaging member to move the projections thereon into the recessed portions on the receiving members, releasing the tension of the spring means so that the latter moves the shaft and tool head away from the support, said means operatively connecting the engaging member to the stop means to force the same into one of the openings in the tool head to prevent further turning movement thereof, and means for rotating the engaging member to move the projecting portions and recessed portions thereon into and out of engagement with the projecting portions and recessed portions on the receiving member.

4. In a machine of the class described, the combination of a fixed support, a revoluble and longitudinally movable shaft extending through said support, a tool head fixed to one end of said shaft and having spaced openings in one side thereof, releasable stop means mounted on the support and extending outwardly therefrom, yieldable means for urging the stop means away from the tool head, said support having a seat for receiving the tool head, spring means on the support for urging the tool head away from said seat, a clutch mechanism on said shaft between the support and the other end of the shaft, said clutch mechanism including an engaging member loosely mounted on the shaft and a receiving member fixed to said shaft, said engaging member being positioned between the fixed support and the receiving member, said support constituting an abutment for limiting the axial movement of the engaging member in one direction and the receiving member limiting the axial movement of the engaging member in an opposite direction, said members having opposed projecting portions and recessed portions, means operatively connecting the engaging member to said stop means for moving the stop means toward the tool head and against the tension of the yieldable means, the rotation of the engaging member to bring the projections thereon in engagement with the projections on the receiving member moving the shaft and tool head axially in engagement with said seat and acting to tension the spring means and maintain the tool head in a fixed operative position relative to the work, and the turning of the engaging member to move the projections thereon into the recess portions on the receiving member, releasing the tension of the spring means so that the latter moves the tool head away from said seat, and means for rotating the engaging member to move the projecting portions and recessed portions thereon into and out of engagement with the projecting portions and recessed portions on the receiving member.

5. In a machine of the class described, the combination of a fixed support, a revoluble and longitudinally movable shaft extending through said support, a tool head fixed to one end of said shaft and having spaced openings in one side thereof, releasable stop means mounted on the support and extending outwardly therefrom, yieldable means for urging the stop means away from the tool head, said support having a seat for receiving the tool head, spring means on the support for urging the tool head away from said seat, a clutch mechanism on said shaft between the support and the other end of the shaft, said clutch mechanism including an engaging member loosely mounted on the shaft and a receiving member fixed to said shaft, said engaging member being positioned between the fixed support and the receiving member, said support constituting an abutment for limiting the axial movement of the engaging member in one direction and the receiving member limiting the axial movement of the engaging member in an opposite direction, said members having opposed projecting portions and recessed portions, means operatively connecting the engaging member to said stop means for moving the stop means toward the tool head and against the tension of the yieldable means, the rotation of the engaging member to bring the projections thereon into engagement with the projections on the receiving member, moving the tool head into engagement with said seat and tensioning the spring means, the turning of the engaging member to move the projections thereon into the recessed portion on the receiving member releasing the tension of the spring means to move the tool head away from said seat, and means for rotating the engaging member, said clutch mechanism normally posi-

tioned to maintain the tool head in engagement with said seat and upon rotation in one direction releasing the tension of the spring means to move the tool head out of engagement with said seat, said clutch mechanism, when rotated in an opposite direction, turning the tool head and forcing the stop means into one of said openings, said clutch mechanism, when returned to its initial position, moving the head into engagement with said seat.

6. In a machine of the class described, the combination of a fixed housing, a revoluble and longitudinally movable shaft mounted in the housing and having a multiple tool head fixed thereon, spring means for moving the shaft to maintain the tool head away from the housing, releasable stop means carried by the housing and arranged to lock the tool head at a predetermined point to prevent rotation of the tool head and maintain a new tool head in proper alignment with the work, yieldable means for urging the stop means away from the tool head, a clutch mechanism including an engaging member loosely mounted on the shaft and a receiving member keyed to said shaft, said engaging member being positioned between the fixed support and the receiving member, said support constituting an abutment for limiting the axial movement of the engaging member in one direction and the receiving member limiting the axial movement of the engaging member in an opposite direction, said members having opposed projecting portions and recessed portions, means operatively connecting the engaging member to said stop means for moving the stop means toward the tool head and against the tension of the yieldable means, the rotation of the engaging member to bring the projections thereon into engagement with the projections on the receiving members, moving the shaft and tool head inwardly toward the housing and tensioning the spring means, the turning of the engaging member to move the projections thereon into the recessed portion on the receiving member, releasing the tension of the spring means so that the latter moves the tool head away from the housing, said means operatively connecting the engaging member to the stop means so that when the tool head reaches a predetermined point to arrest the moving thereof to bring a new tool in alignment with the work, and means for rotating the engaging member to move the projecting portions and recessed portions thereon into and out of engagement with the projecting portions and recessed portions on the receiving member.



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