No. 726,674. PATENTED APR. 28, 1903.

C. L. GOODRICH.

TOOL HOLDER FOR SCREW MACHINES.

APPLICATION FILED MAY 10, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

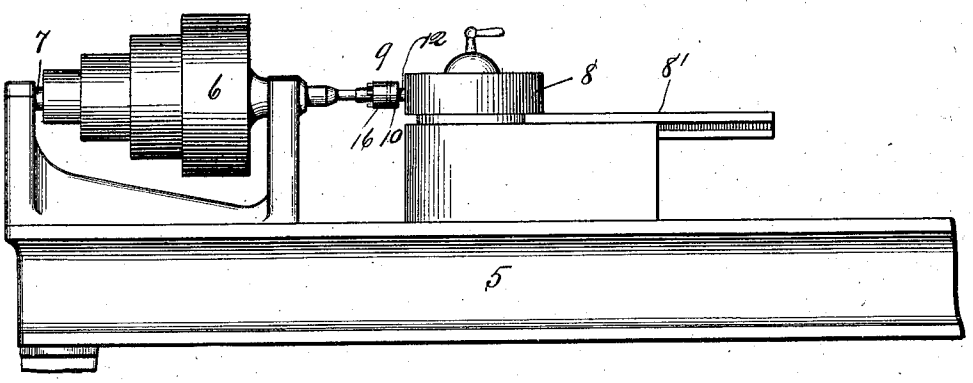


Fig. 2.

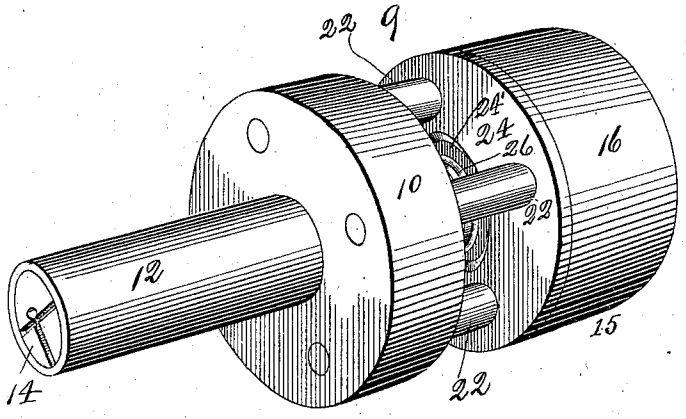
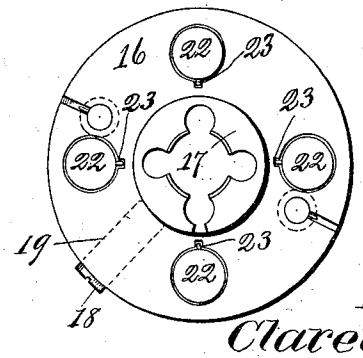


Fig. 3.



Witnesses:

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Inventor:

Clarence L. Goodrich

By his Attorneys

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

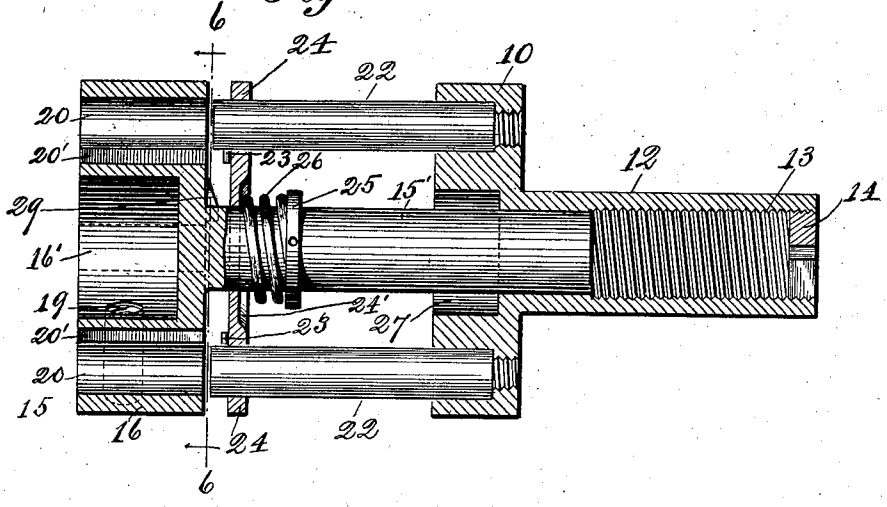


Fig. 5.

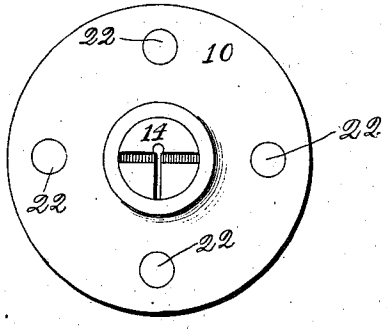


Fig. 6.

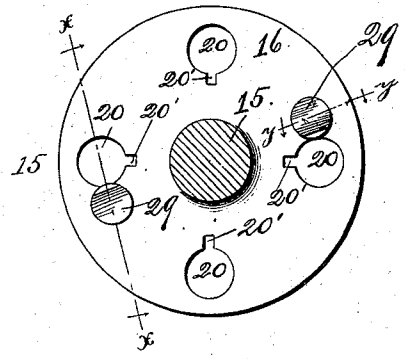


Fig. 7.

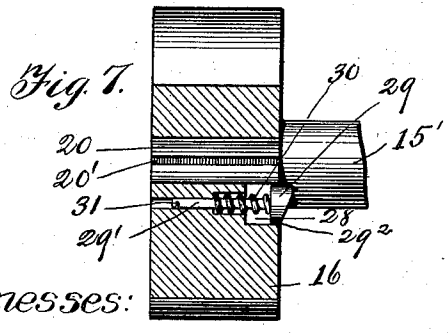
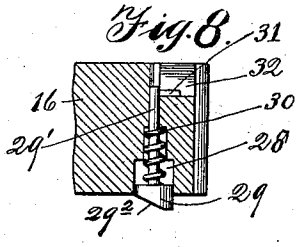


Fig. 8.



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UNITED STATES PATENT OFFICE.

CLARENCE L. GOODRICH, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE PRATT & WHITNEY COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

TOOL-HOLDER FOR SCREW-MACHINES.

SPECIFICATION forming part of Letters Patent No. 726,674, dated April 28, 1903.

Application filed May 10, 1902. Serial No. 106,669. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE L. GOODRICH, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Tool-Holders for Screw-Machines, of which the following is a specification.

My invention relates to screw-machines, and more especially to that class of said machines which have an intermittingly-actuated turret or carrier in sockets of which the tools or their supports are placed.

Mainly the object of my invention is to so improve a machine of the class described that its defects will be obviated and a tool-holder working positively and accurately at all times will be produced.

A further object of the invention is the provision of improved devices for limiting the threading operation, and thus determining the length of thread to be cut.

A further object of the invention is the provision, in a tool-holder, of a stationary head having a tubular shank, rods or bolts projecting from said head, a plate having a sliding movement limited by stops on the rods in a forward direction, a second head in which the threading-tool is mounted, said head having a stem passing through a perforation in the plate, and a spring bearing against said plate.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a screw-machine with my improved tool-holder applied thereto. Fig. 2 is a perspective view of said tool-holder. Fig. 3 is a view of the face of the movable member of said tool-holder with a screw-cutting die shown therein. Fig. 4 is a longitudinal vertical section of the tool-holder with certain parts shown in elevation. Fig. 5 is an end view of the fixed member of the tool-holder, showing a stop carried in the stem thereof. Fig. 6 is a transverse section upon line 6 6 of Fig. 4 looking in the direction of the arrow. Fig. 7 is a vertical section upon line $x\,x$ of Fig. 6 of the head of the movable member, and Fig. 8 is a section upon line $y\,y$ of Fig. 6.

Like numerals designate similar parts in all the figures of the drawings.

Referring to the drawings, the numeral 5 designates the frame of a screw-machine, and the numeral 6 pulleys mounted upon a spindle 7, which is designed to carry the stock-chuck and to impart rotary motion thereto when power is applied to the spindle.

In a turret 8, carried by a slide 8′, forming part of the screw-machine and capable of longitudinal movement either by hand or automatically, as desired, upon the framework thereof, is mounted my improved tool-holder, designated in a general way by 9 and comprising a fixed member 10, having a tubular shank 12, which is secured in any desired manner in a socket of the turret, said shank being internally threaded at 13, as illustrated in Fig. 4, and carrying an adjustable split plug or stop 14, subserving a purpose hereinafter described.

Mounted for reciprocative movement in the bore of the shank 12 is the stem 15 of the movable member of my improved tool-holder, which stem projects from a head 16, provided with a recess 16′ for the reception of a screw-threading die 17, held therein by a set-screw 18, fitted into a threaded bore 19 and bearing at its inner end against said die. This head 16 is also provided with perforations 20, into each of which opens a slot 20′ for the reception of bolts or projections 22 and stop pins or lugs 23, carried by said bolts, said bolts 22 passing through the perforations 20 and the stop-pins 23 through the slots 20′ and the rear ends of said bolts being threaded into the head of the fixed member 10.

Slidingly mounted upon the stem 15 is a plate 24, through perforations in which the bolts 22 pass, and bearing between said plate and a collar 25, secured to the stem 15, is a spring 26. The fixed member 10 is recessed at 27 to receive said collar and spring when the movable member is moved to the right in Fig. 4, and the plate 24 is preferably provided with a depression 24′ to accommodate the end convolution of the spring 26.

As best illustrated in Figs. 7 and 8, the head 16 of the movable member is recessed at 28 for the reception of the heads of spring-pressed latches 29, the stems 29′ of said latches carrying coil-springs 30, which nor-

mally tend to force the latches outward or to the right in Fig. 7. Upon their opposite ends the stems of the latches carry stop-pins 31, which engage the end walls of slots 32 in the head, as shown in Fig. 8, and thereby limit the outward movement of said latches.

The operation of this improved tool-holder is as follows: At the commencement of a thread-forming operation the tool-holder is in the position illustrated in Fig. 1, where the turret has been advanced, and the rapidly-revolving stock is therefore in engagement with the screw-threading die 17 or other tool employed carried in the recess 16′, and it is obvious that when this is done the movable member 16, carrying such screw-threading tool, will be held against rotative movement by the bolts 22, which have then entered the perforations 20, and that it will be drawn forward or to the left in Figs. 1 and 4 until it reaches the position shown in Fig. 4, when the plate 24 will come into contact with the stop-pins 23 of the bolts 22, after which any further movement of the member 16 in a forward direction will be made against the tension of the spring 26, this further movement, which now takes place, serving to withdraw the bolts 22 from the perforations 20 and causing the thread-forming operation to cease, as the member 16 will now rotate idly with the stock. As shown in Fig. 2, the fixed and movable members have not been separated from one another far enough to cause the plate 24 to come into contact with the stop-pins 23; but when this happens said plate will be forced from the position shown in said Fig. 2 to that illustrated in Fig. 4, thereby permitting the latches 29 to be forced outward by the springs 30, as shown in Figs. 7 and 8, until the stop-pins 31 come into contact, as hereinbefore described, with the bottoms of the slots 32. As the movable member continues to revolve idly with the now threaded stock the projecting latches 29 strike against the bolts 22, said bolts riding over the inclined end faces 29^2 of the latch-heads as long as said movable member continues to rotate in a forward direction. The direction of rotation of the stock-holding chuck is now reversed, and the bolts 22 will therefore engage the sides of the latch-heads, which will hold the movable member against further rotation in a reverse direction and will cause said member to be forced toward the fixed member by the threaded work as it withdraws from the tool, and the bolts 22 will now again enter the perforations 20 until the movable and fixed members come into contact preparatory to repeating the threading operation. When it is desired to vary the length of thread to be cut, the split plug or stop 14 is screwed into the shank 12 until it assumes any desired position longitudinally thereof, thereby acting as a stop for the stem of the movable member to abut against and determining the point at which said movable member shall again begin the thread-forming operation, and consequently the length of thread to be cut upon the stock.

In devices of this character it has been found that when the turret is rotated preparatory to beginning the thread-forming operation the inertia of the movable member is apt to cause it to be thrown away from the fixed member, which is objectionable, for if when that is done the bolts 22 should be thrown out of alinement with the perforations 20 such alinement would have to be restored by hand before the formation of the thread could be continued, and to overcome this objection the plate 24, collar 25, and spring 26 are provided, said spring being of sufficient tension to resist any tendency of the movable member to be thrown beyond the ends of the bolts 22 under the action of centrifugal force.

Any means for reciprocating and intermittingly rotating the turret, either manually or automatically, may be employed; but as such means constitute no part of my invention they are not illustrated.

While a screw-cutting die is shown mounted in the movable member of the tool-holder, my invention is not limited thereto, for a tap or other screw-cutting tool may be substituted therefor, if desired.

My invention is not limited to the precise construction illustrated, for many changes may be made without departure therefrom, nor is it limited to use with any particular kind of machine.

Having thus described my invention, what I claim is—

1. In a tool-holder, the combination, with a member having a tubular shank, of a second member having a stem inserted in the bore of said shank; means for clutching said members; a turret on which the member having a shank is carried; a yielding plate carried by the movable member; and means whereby said plate is caused to resist the movement of said movable member when the turret is rotated, to thereby prevent disconnection of the means for clutching said members.

2. The combination, with a tool-holder comprising two members, one of which is reciprocative and rotative relatively to the other, said member having perforations, of yielding stops carried by said member; bolts carried by the other member and adapted to enter the perforations and also to engage said stops; a plate fitted upon the bolts; lugs carried by said bolts and fitting keyways in the movable member; and a spring carried by one member and bearing against the plate.

3. The combination, with a tool-holder comprising two members, one of said members having a socket, of a stem carried by the other member and fitting in said socket; a series of projections carried by one member and adapted to fit in a corresponding series of recesses in the other member; a yielding stop adapted to be engaged by one of the projections; a de-

vice slidably mounted upon said stem; a collar upon said stem; and a spring between said collar and said device and normally holding the device and the other of said members in contact.

4. In a tool-holder, the combination, with a fixed member and a movable member, of projections carried by one of said members, the other member having perforations or recesses for the reception of said projections; a stem on one of the members; stops carried by said projections and located adjacent to the ends thereof; and a spring-controlled plate carried by said stem and adapted to be engaged by said stops before the projections are withdrawn from the recesses or perforations, upon the movement of the movable member away from the fixed member.

5. In a tool-holder, the combination, with a fixed member, of a movable member, one of said members having projections and the other perforations to receive the projections; a yielding plate carried by the member having perforations; stops carried by the projections; and yielding stops on one of the members with which the projections are adapted to engage.

6. In a tool-holder, the combination, with a fixed member, of a movable member; a series of projections carried by one member and adapted to engage the other member; a spring-controlled device carried by one of the said members; and stops upon the other member arranged to engage the spring-controlled device, said stops serving to limit the outward movement of the movable member.

7. The combination, with a tool-holder, comprising fixed and movable members, of projections carried by one of said members; and adapted to enter recesses formed in the other member; a split stop threaded into a bore of the fixed member; and a stem on the movable member slidably mounted in said bore, and adapted to engage said stop.

8. In a tool-holder, the combination, with a fixed member, of a movable member, one of said members having a stem slidably mounted in a bore of the other member; projections carried by one of said members and adapted to enter recesses in the other member; and a stop threaded into said bore, and serving to limit the movement of said movable member.

9. The combination, with a turret, of a head having a tubular shank; rods projecting from said head; a tool-carrying head having perforations to receive the rods, and provided with a stem entering the tubular shank; a plate carried by the stem and perforated to receive the rods; lugs on the rods arranged to engage the plate for limiting the outward movement of the tool-carrying head; and a spring carried by the stem and bearing against said plate.

10. The combination, with a head having a bore, of a second head having a shank inserted in said bore and slidable therein; means for clutching the heads; a plate movable with relation to the shank; a spring bearing against said plate; and means arranged to contact with the plate for arresting outward movement of the movable head.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE L. GOODRICH.

Witnesses:

WILLIAM H. MILLER,

DEAN E. BELCHER.