No. 664,876. Patented Jan. 1, 1901.

G. L. MASON.

TURRET LOCK FOR SCREW MACHINES.

(Application filed Dec. 22, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig 1

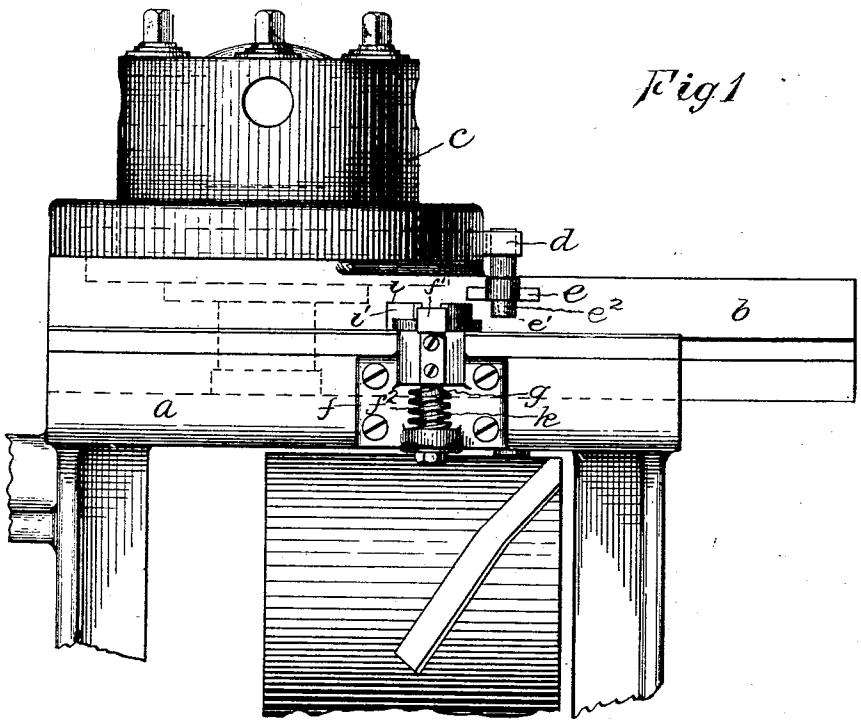

Fig. 2

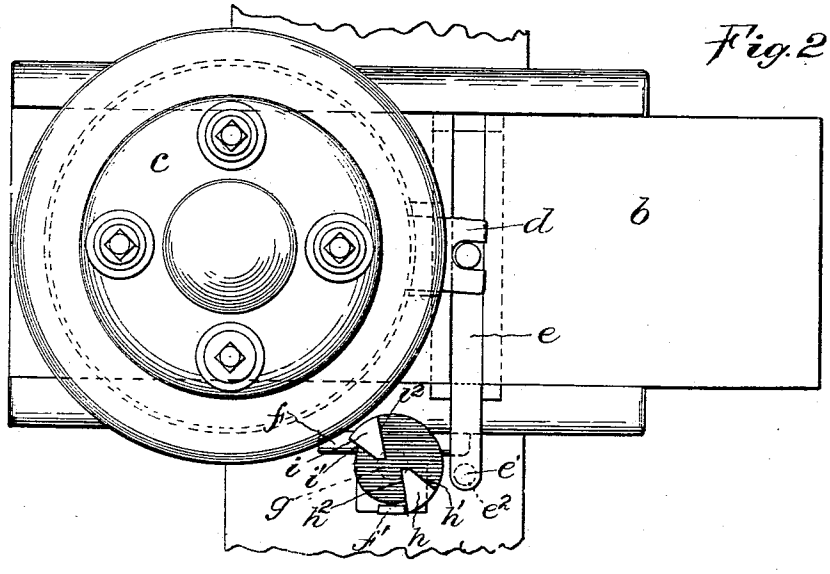

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Fig. 3

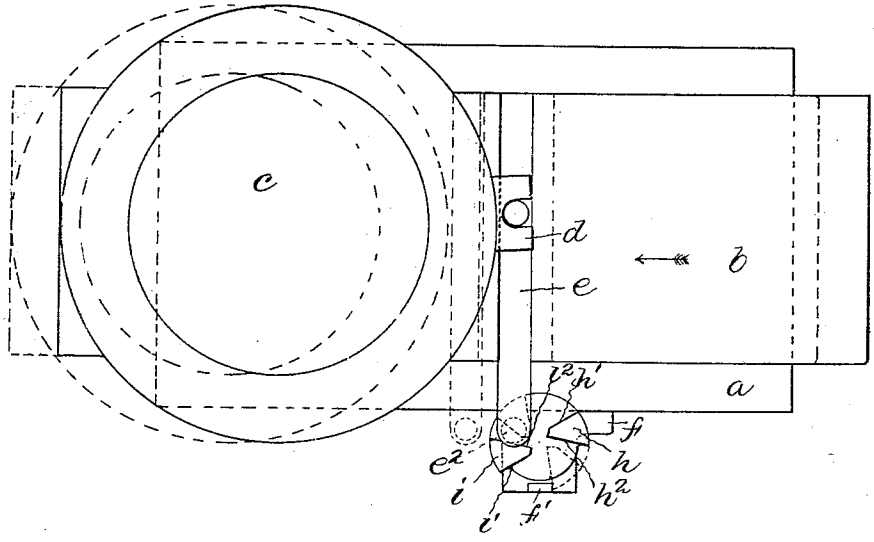
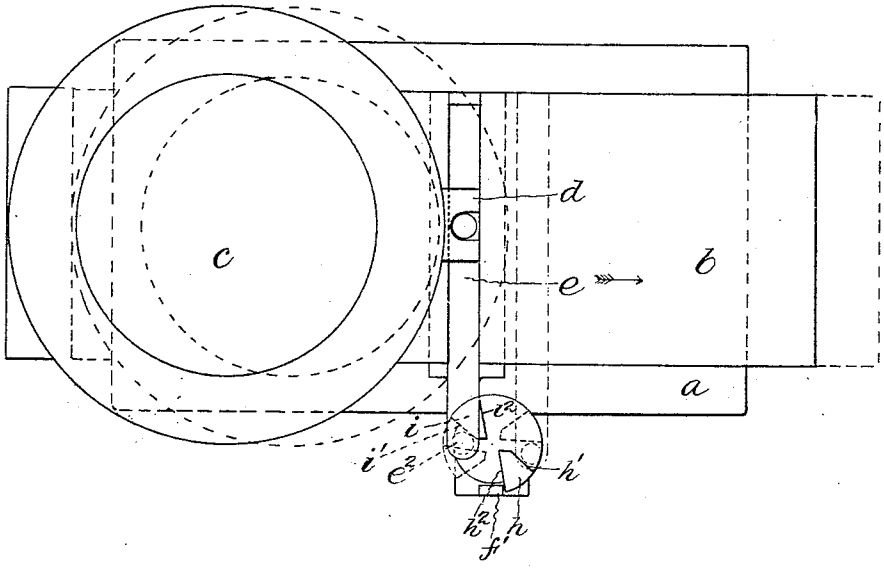


Fig. 4



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UNITED STATES PATENT OFFICE.

GEORGE L. MASON, OF WAREHOUSE POINT, CONNECTICUT, ASSIGNOR TO THE HARTFORD MACHINE SCREW COMPANY, OF HARTFORD, CONNECTICUT.

TURRET-LOCK FOR SCREW-MACHINES.

SPECIFICATION forming part of Letters Patent No. 664,876, dated January 1, 1901.

Application filed December 22, 1899. Serial No. 741,254. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. MASON, of Warehouse Point, in the county of Hartford and State of Connecticut, have invented a new and useful Turret-Lock for Screw-Machines, of which the following is a specification.

My invention relates to the class of devices used for producing a reciprocation of a movable member across its main path of movement without regard to the particular class or kind of mechanism in which the device is employed, although it is described and illustrated herein in connection with a screw-machine as a structure in which it finds ready application.

The object of my invention is to provide a device in which the construction shall be greatly simplified, a more direct and efficient action secured, and the labor of adjusting the parts and operating the machine reduced. One form of mechanism by means of which this object may be attained is illustrated in the accompanying drawings, in which—

Figure 1 is a view in side elevation of so much of a screw-machine, including the turret, as is needed to illustrate an embodiment of my invention. Fig. 2 is a detail top or plan view of the same. Fig. 3 is a diagram view illustrating the method of operation of the shifter-cam in the unlocking movement of the shifter-slide. Fig. 4 is a diagram view illustrating the position of parts on the reverse or return movement of the turret-slide with the cam in the locked position.

In the accompanying drawings, the letter *a* denotes the bed of a screw-machine, and *b* a turret-slide mounted on the bed in the usual manner and connected with the ordinary mechanism for moving the slide and for rotating the turret *c*, which is pivotally supported on the slide. The turret is provided with a clamping-ring *d*, all of the parts just described being practically the same as is shown in United States patent to George E. Witherell, dated August 31, 1897, No. 589,379, and reference to which is here made for details of the clamp, as such, and its operation and other parts connected with the turret and not specifically herein shown and described, my invention relating simply to the means for moving or shifting the clamping-ring to lock or unlock the turret.

As shown in Figs. 1 and 2 of the drawings, the turret-slide is at the outer end of its path of reciprocating movement with reference to the stock on which the tools are adapted to work, and the clamping-ring *d* is moved into position occupied when the turret is unlocked, it having been moved into this position so as to leave the turret free to be turned by the turret-rotating mechanism.

A shifter-slide *e* is arranged in a suitable slideway on the carriage or turret-slide with one end projecting beyond the side of the bed and bearing a stud *e'*, on which a roller e^2 is supported.

In a bracket *f*, preferably removably secured to the side of the bed of the machine, a cam-shaft *g* is supported, in a socket in which it has a turning movement on its axis. On the upper end of the cam-shaft *g* two similar cams *h* and *i* are arranged on opposite sides of the center of the shaft, with working faces located in planes substantially parallel to the axis of the shaft, this construction having little liability to cramp in the operation of the parts, although the invention is not necessarily limited to such form. The cam *h* when viewed in plan is of irregular outline, the working face *h'* being located so as to lie at an angle across the path of movement of the roller e^2 when the latter is moved with the shifter-slide in the forward movement of the turret-slide. The opposite face h^2 of this cam rests against one edge of a stop *f'*, which is located on the bracket *f*. The cam-shaft is held in the position illustrated in Fig. 2 of the drawings by means of a spring *k*, preferably a helical spring located in a recess f^2 in the bracket with one end attached to the cam-shaft and the other to a wall of the recess, this being the normal position of the shifter-cam. When the shifter-cam is in this normal position, in which it is held yieldingly by the spring *k*, the shifter-slide *e* is moved by the contact of the roller e^2 with the face *h'* of the cam in a direction to operate the clamping-ring to lock the turret. The roller e^2 in the continued forward movement of the turret-

slide pushes against the face i^2 of the cam i and rotates the shaft until the roller passes beyond the face i^2, when the spring k rotates the shaft and returns the cam to its normal position. The clamping-ring being now in the locked position the roll e^2 on the end of the stud e' in a reverse or backward movement of the turret-slide will encounter the face i' of the cam i and thrust against it; but in view of the fact that the cam-shaft is held against rotation by the contact of the face h^2 of the cam h with the stop f' the roller moves down the face i' of the cam i and throws the shifter-slide in a direction to move the cam-ring to unlock the turret. As the turret-slide continues its outward or backward movement the roller e^2, in the position illustrated in Fig. 4 of the drawings, strikes against the face h^2 of the cam h and pushes the latter out of the way by rotating the cam-shaft until the roller e^2 has passed beyond the surface h^2, when the recoil of the spring k returns the shifter-cam to its normal position and resets the cams for a repetition of the above-described operation in each complete reciprocating movement of the turret-slide.

It is obvious that the movable element, as the shifter-slide which bears a roller or like part adapted to encounter the working faces of the cams borne on the rocking cam-shaft, may be connected with and operate any movable member with which it may be connected without regard to the particular function of the member, which in the within-described machine is a clamping-ring, and my invention is not limited to the combination of the rocking shifter-cam and the shifter-slide with the clamping-ring only, but may be used in combination with parts or elements having other functions, and the combination of this main element, the movable part having the lateral and longitudinal movement, and the rock-shaft bearing the shifter-cams is within the scope of my invention and contemplated by me.

A main advantage of my improved device resides in the fact that the locking and unlocking movement of the clamping-ring is effected by a device located practically near one end of the path of reciprocating movement of the carriage-slide and is arranged in a simple and compact form in practically one structure so far as the cam is concerned. This is a marked advantage over prior devices, in which the reciprocating movement of a member like the shifter-slide, connected to the clamping-ring, is effected by a plural number of cams located at or near opposite ends of the path of reciprocating movement of the turret-slide and of the sidewise movement of the shifter-slide. It provides a simple, compact, and positive means for translating the positive movement of the shifter-slide into a reciprocating movement.

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In combination in a machine-tool, a bed, a carriage movably mounted with relation to the bed, a shipper member borne by the carriage and adapted to have a reciprocating movement thereon, and tilting cams for reciprocating said member, said cams being stationary during the reciprocating movement of the shipper member but movable by said member when it has reached either limit of its transverse play.

2. In a screw-machine, in combination, a sliding carriage, a rotating turret mounted on the carriage, a clamp for holding the turret against rotation, a shifter-slide mounted on the carriage and operatively connected with the clamp, a rock-shaft mounted in operative relation to the shifter-slide, and cams borne on the end of the rock-shaft and adapted to impart to the shifter-slide a reciprocating movement to actuate the clamp.

3. In a screw-machine, in combination, a sliding carriage, a rotating turret mounted on the carriage, a clamp for holding the turret against rotation, a shifter-slide mounted on the carriage and operatively connected with the clamp, a rock-shaft mounted in operative relation to the shifter-slide, cams borne by the rock-shaft and adapted to be interposed in the path of movement of the shifter-slide to effect its reciprocating movement to operate the clamp, and means causing the slide to engage the shifter-cams.

4. In a screw-machine, in combination, a sliding carriage, a rotating turret mounted thereon, means for holding the turret against rotation, a shifter-slide borne by the carriage and having a reciprocating movement in a direction laterally of the path of movement of the sliding carriage and connected with the turret-clamp, a rock-shaft mounted in operative relation to the shifter-slide, a cam borne by the shaft and adapted to be interposed in the path of movement of the shifter-slide to move it in one direction, a cam adapted to be interposed in the path of movement of the shifter-slide to move it in the opposite direction, and means for interposing said cams in the path of movement of the shifter-slide.

5. In a screw-machine, in combination, a sliding carriage, a rotating turret mounted on the carriage, a clamp for holding the turret against rotation, a shifter-slide mounted on the carriage and having a reciprocating movement in a direction laterally of the path of sliding movement of the carriage and connected with the turret-clamp, a rock-shaft mounted in operative relation to the shifter-slide, two cams borne by the rock-shaft, one having a surface for engagement with the shifter-slide to move it in one direction and a surface to engage with the shifter-slide to move the rock-shaft, and the other cam having a surface for engagement with said slide to move it in the opposite direction and a surface to engage with the slide to rock the shaft, and means for returning the shaft to its normal position.

6. In a screw-machine, in combination, a

reciprocating carriage, a rotating turret mounted on the carriage, a clamp for holding the turret against rotation, a shifter-slide mounted on said carriage and operatively connected with the clamp, a rock-shaft supported in operative relation to the shifter-slide, cams borne by the rock-shaft and adapted to be interposed in the path of movement of the shifter-slide, each cam having a surface adapted to move the shifter-slide and a surface adapted to rock the shaft, a stop to hold the shaft against rotation during the movement of the slide to operate the clamp, and means for returning the shaft to its normal position.

7. In combination, a sliding carriage, a shifter-slide borne by the carriage, mechanism connected with the slide to be operated thereby, a rock-shaft supported in operative relation to the shifter-slide, cams located on the end of the shaft on opposite sides of the axis thereof, one face of each cam being adapted to move the shifter-slide in one direction and the other face of each cam being adapted to rock the shaft to move the cam out of the path of movement of the slide, and means for returning the rock-shaft to its normal position.

8. In combination, a sliding carriage, a shifter-slide borne by the carriage, mechanism connected with the shifter-slide to be operated thereby, a rock-shaft supported in operative relation to the shifter-slide, cams located on the end of the shaft on opposite sides of the axis thereof, one face of each cam being adapted to move the shifter-slide in one direction and the other face of each cam being adapted to rock the shaft to move the cam out of the path of movement of the slide, a stop adapted to engage one of said cams to hold the shaft against movement during the reciprocating movement of the shifter-slide, and means for returning the shaft to its normal position.

9. In combination in a machine-tool, a bed, a slide mounted on the bed and having two movements in transverse paths, means for imparting to the slide a reciprocating movement in one of said paths, means intermittently engaging the slide to reciprocate it in the other of said paths, said means being partly moved by said slide into position to cause said reciprocation, and mechanism connected with the slide to be operated thereby.

10. In a machine-tool, in combination, a bed, a slide mounted on the bed and having a movement in two paths extending in transverse directions, means for imparting to the slide a reciprocating movement in one of said paths, means for causing movement of the slide in the other of said paths, said means being moved by the slide into position to cause said reciprocation, and mechanism connected with the slide to be operated thereby.

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Witnesses:
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