July 8, 1941. H. ADCOCK 2,248,692

SCREW-THREAD CHASING MECHANISM FOR LATHES AND LIKE MACHINE TOOLS

Filed Feb. 16, 1940 3 Sheets-Sheet 1

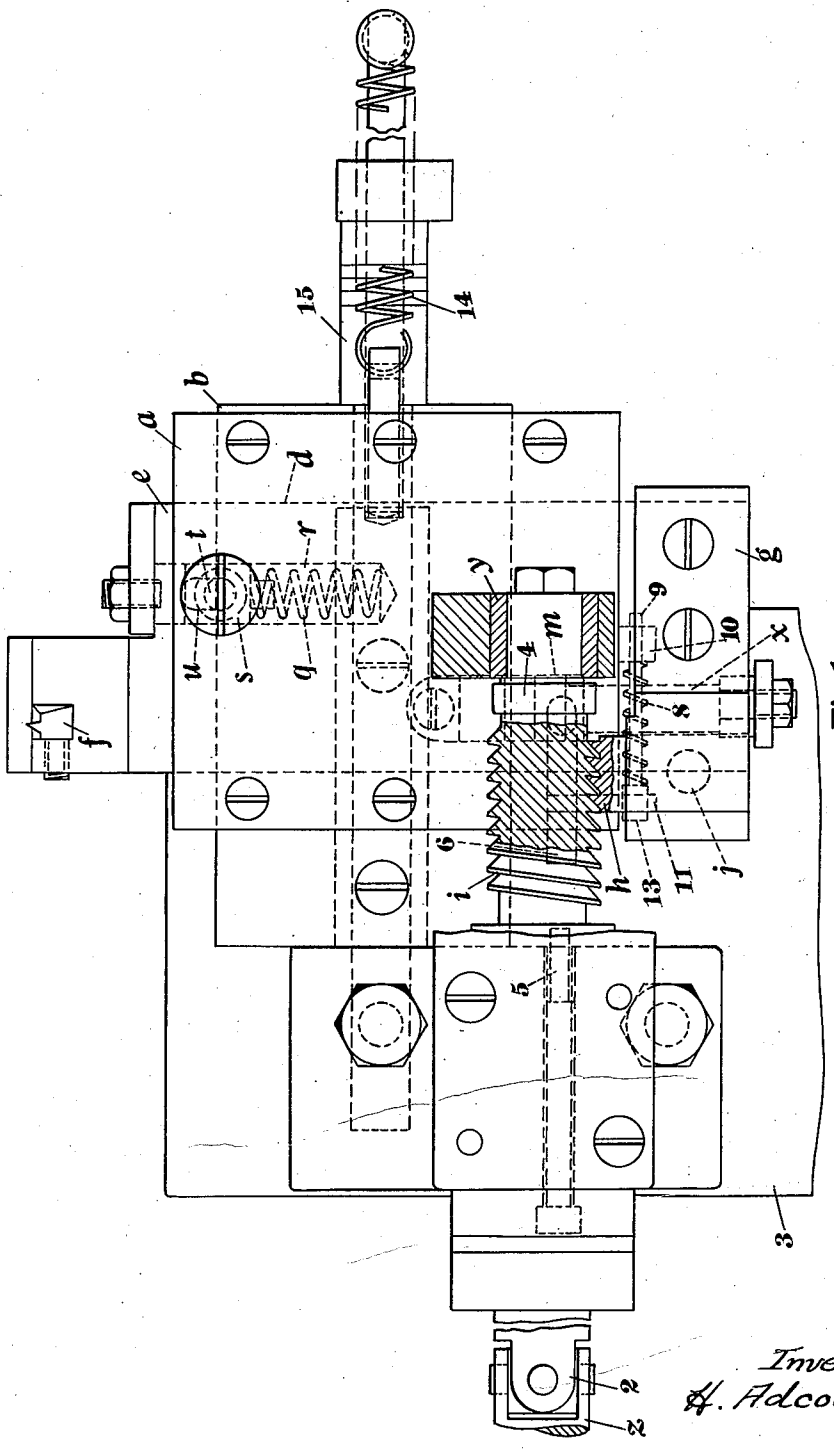


Fig.1

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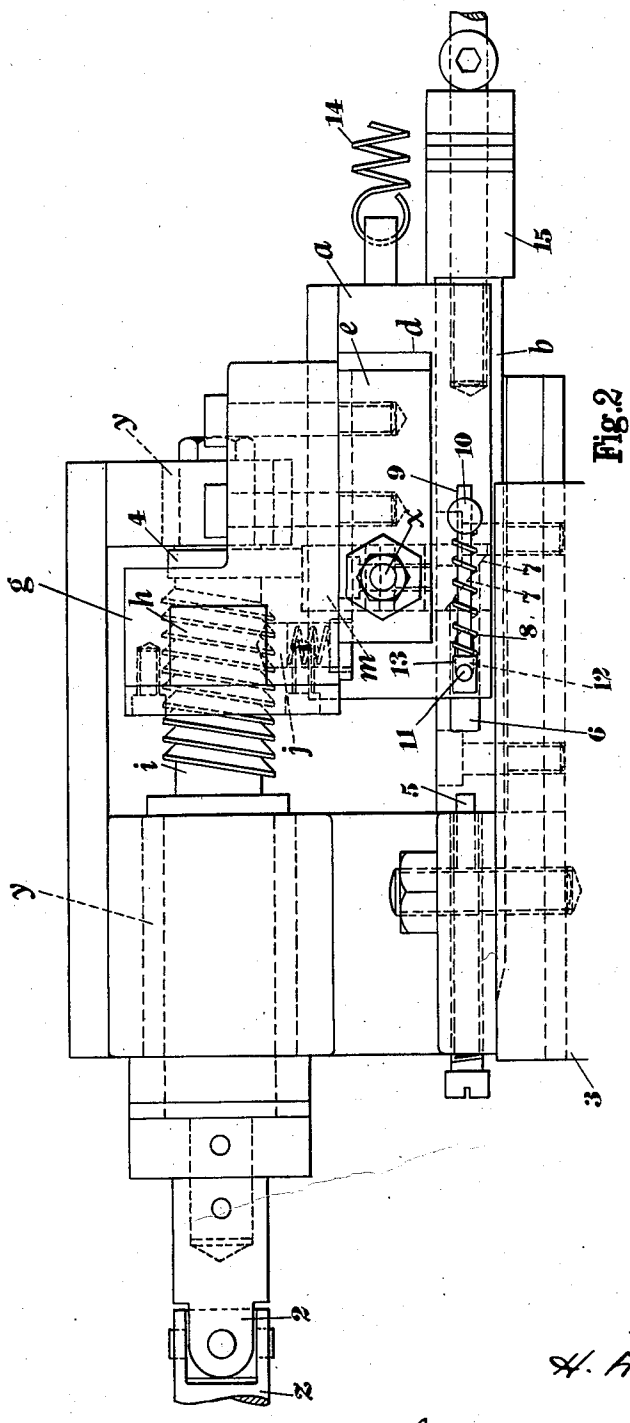


Fig.2

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Filed Feb. 16, 1940 3 Sheets-Sheet 3

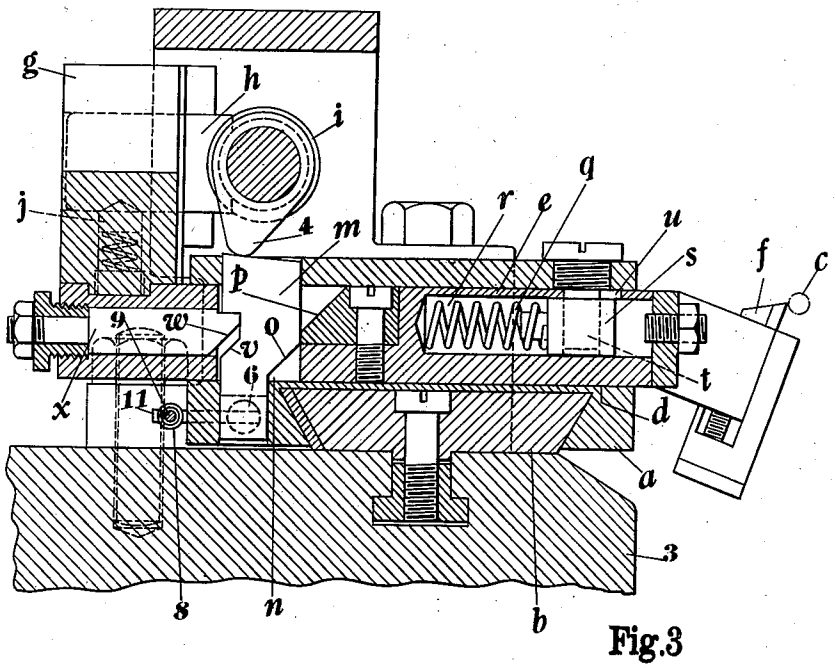


Fig.3

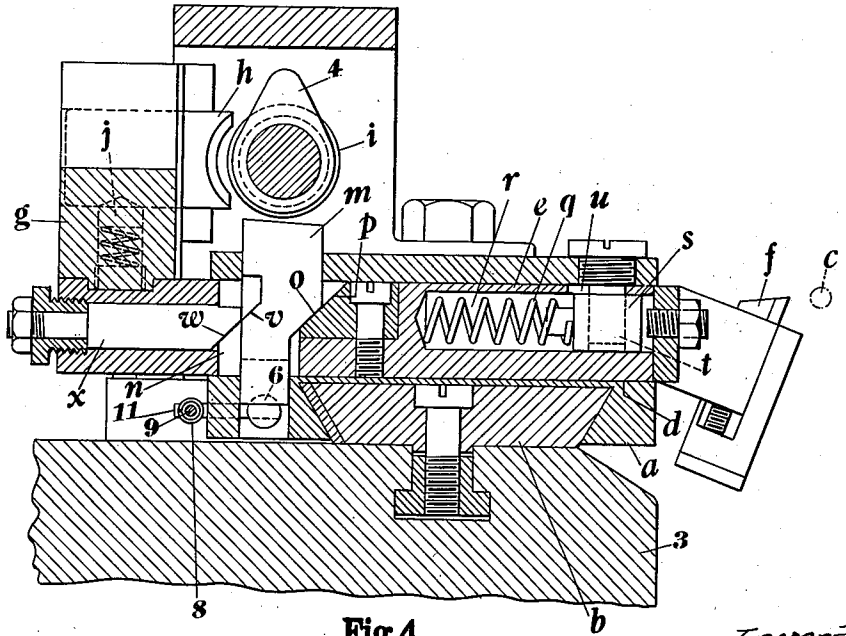


Fig.4

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Patented July 8, 1941 2,248,692

UNITED STATES PATENT OFFICE

2,248,692

SCREW-THREAD CHASING MECHANISM FOR LATHES AND LIKE MACHINE TOOLS

Horace Adcock, Birmingham, England, assignor to Joseph Lucas Limited, Birmingham, England

Application February 16, 1940, Serial No. 319,349
In Great Britain February 28, 1939

9 Claims. (Cl. 82—5)

This invention has for its object to provide an improved screw-thread chasing mechanism for use on lathes and like machine tools.

The invention comprises the combination with a slide, of a tool holder movable on the slide in a direction at right angles to the direction of motion of the slide, a follower mounted on the tool holder and engageable with a master screw, and means carried on the slide for advancing and retracting the tool holder.

The invention also comprises the combination with a mechanism as specified in the preceding paragraph, of a cam on the master screw, and a stop on the part carrying the slide, for imparting opposite movements to the tool holder actuating means.

In the accompanying sheets of explanatory drawings:

Figure 1 is a plan, Figure 2 a front elevation, and Figure 3 a sectional side elevation, of a screw-thread chasing mechanism constructed in accordance with the invention, the tool holder being in its advanced position.

Figure 4 is a similar view to Figure 3 showing the tool holder in its retracted position.

In carrying the invention into effect as shown, I employ a slide *a* adapted to be mounted on a guide *b* and movable thereon parallel with the axis of the work piece *c*. In a guide opening *d* formed within and transversely across the slide *a* I mount a tool holder *e* which extends at each end from the slide. At the end adjacent to the work piece *c* the tool holder *e* is adapted to carry a detachable thread cutting chaser *f*, and at the other end of the tool holder I provide a post or other support *g* adapted to hold a removable follower *h* having one end in the form of a half-nut so that it can engage the threads of a master screw *i*. Preferably and as shown the follower *h* is held in its support *g* by a spring-loaded plunger *j* which will allow the follower to become disengaged from the master screw *i* in the event of accidental obstruction to the normal movements of the slide *a*.

For moving the tool holder *e* relatively to the slide *a*, I mount in the latter and at right angles to the tool holder a vertically slidable actuating member *m* which passes through a vertical opening *n* in the tool holder. At one of its vertical sides the actuating member *m* is formed with an abutment *o* (conveniently an oblique shoulder) which by co-operation with a complementary abutment *p* on the tool holder *e* can, when the actuating member is pushed downwards, advance the tool holder against the action of a compression spring *q* to bring the chaser *f* to its operative position and the follower *h* into engagement with the master screw *i* as shown in Figures 1 and 3. The spring *q* is arranged in a blind bore *r* formed horizontally in the tool holder *e*, and bears at one end against the inner end of the bore and at the other end against an abutment piece *s* slidably arranged in the bore, this abutment piece being engaged by a peg *t* which is carried on the slide *a* and extends into the bore through a slot *u* in the tool holder. When in its depressed position the actuating member *m* also serves to lock the tool holder *e* against accidental movement. On moving the actuating member *m* upwards the tool holder *e* may be returned by the spring *q* to its retracted position shown in Figure 4. But preferably the actuating member *m* is provided on its vertical side remote from the abutment *o* with another abutment *v* (conveniently an oblique shoulder) which by co-operation with a complementary abutment *w* on the tool holder *e* can return the latter to its retracted position. In the example shown the abutment *w* is formed by one end of a member *x* which is adjustably secured to the tool holder *e* so that the said end extends into the vertical opening *n* in the tool holder.

The master screw *i* is carried in bearings *y* and driven by any convenient means, such as a spindle *z* connected to the master screw through a universal coupling **2** and driven through a clutch (not shown) from any convenient source of motion. These bearings *y* and the guide *b* for the tool holder slide *a* are mounted on a feed slide **3** which is movable at right angles to the axis of the work piece *c*.

For operating the tool-holder actuating member *m* I provide on the master screw *i* a cam **4** adapted by acting on the upper end of the said member to depress it and so advance the tool holder to its operative position. To return the actuating member *m* I provide on the feed slide **3** an adjustable stop **5** which through a wedge piece **6** can raise the actuating member, the wedge piece being slidably supported in a horizontal opening in the tool-holder slide *a*. The latter movement of the actuating member *m*, which takes place when the wedge piece **6** is prevented from moving with the slide *a* by contact of the stop **5** with an outer projecting end of the wedge piece, is effected by the interaction of complementary inclined surfaces **7** formed respectively on the lower end of the actuating member and the inner end of the wedge piece. The wedge piece **6** is loaded by a spring **8** which

serves to return the wedge piece to its initial position when the slide *a* is moved away from the stop **5**. In the example shown the spring **8** is mounted on a rod **9** which at one end extends through and is slidably supported by a projection **10** on the slide *a*, and at the other end is connected to a pin **11** mounted on the wedge piece **6** and extending through a slot **12** in the slide, the spring bearing at one end against the projection on the slide and at the other end against a shoulder or collar **13** on the rod. If desired the wedge piece above mentioned may be dispensed with, and the actuating member raised by the direct action of the adjustable stop.

Movement of the tool-holder slide *a* during the cutting action of the chaser *f* is effected by the engagement of the follower *h* with the master screw *i*. On retracting the tool holder *e* for disengaging the chaser *f* from the work piece *c* and the follower *h* from the master screw *i* the slide *a* is returned to its initial position by a spring **14** or weight, this position of the slide being determined by any convenient stop **15**.

When in use the mechanism above described operates in the following manner. With the slide *a* in its initial position, and the master screw *i* rotating, the cam **4** depresses the tool holder actuating member *m*, causing the latter to advance the chaser *f* to the work piece and engage the follower *h* with the master screw, the depth of cut of the chasing tool being determined by movement of the feed slide **3**. The tool holder slide *a* under the action of the master screw *i* travels along the guide *b* causing the chaser *f* to operate on the work piece *c*. At the end of this movement the wedge piece **6** carried by the tool holder slide *a* encounters the stop **5** causing the actuating member *m* to be raised, and the tool holder *e* and follower *h* to be retracted. The tool holder slide *a* is then returned to its initial position by the spring **14** or weight, and the operation is repeated by the cam **4** again depressing the actuating member *m* of the tool holder *e*. Also a further feed movement is given to the feed slide 3, the operations being repeated until the required screw thread has been formed. To stop the action of the mechanism the master screw *i* is stopped by operation of the driving clutch above mentioned or otherwise.

By this invention a screw-thread chasing mechanism especially adapted for use on automatic lathes and like machine tools is provided in a very simple and convenient form.

The invention is not limited to the example above described as subordinate constructional details may be varied to suit different requirements.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder carried by the slide and capable of tool-advancing and retracting movements relatively to the slide in a direction at right angles to the direction of motion of the slide, a follower mounted on the tool holder and engageable with a master screw by the tool-advancing movement of the tool holder, and an automatically operable actuating member carried by the slide and slidable in a direction at right angles to the tool holder for moving the latter relatively to the slide.

2. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder carried by the slide and capable of tool-advancing and retracting movements relatively to the slide in a direction at right angles to the direction of motion of the slide, a rotatable master screw on the part carrying the slide, a follower mounted on the tool holder and engageable with the master screw by the tool-advancing movement of the tool holder, an actuating member carried by the slide and slidable in a direction at right angles to the tool holder for imparting movement to the latter, a cam on the master screw, and a stop on the part carrying the slide, the said cam and stop being adapted to impart opposite movements to the said actuating member for advancing and retracting the tool holder.

3. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder movable on the slide in a direction at right angles to the direction of motion of the slide, a follower mounted on the tool holder and engageable with a master screw, and an actuating member carried by the slide and slidable in a direction at right angles to the tool holder for advancing and retracting the tool holder, the latter and the actuating member being provided with complementary abutments which by their interaction serve to impart movement to the tool holder from the said member.

4. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder movable on the slide in a direction at right angles to the direction of motion of the slide, a rotatable master screw on the part carrying the slide, a follower mounted on the tool holder and engageable with the master screw, an actuating member carried by the slide and slidable in a direction at right angles to the tool holder for advancing and retracting the tool holder, the latter and the actuating member being provided with complementary abutments which by their interaction serve to impart movement to the tool holder from the said member, a cam on the master screw, and a stop on the part carrying the slide, the said cam and stop being adapted to impart opposite movements to the said actuating member.

5. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder movable on the slide in a direction at right angles to the direction of motion of the slide, a follower mounted on the tool holder and engageable with a master screw, an actuating member carried by the slide and slidable in a direction at right angles to the tool holder for advancing and retracting the tool holder, the latter and the actuating member being provided with complementary abutments which by their interaction serve to impart movement to the tool holder from the said member, and a spring for opposing tool-advancing movement of the tool holder by the actuating member.

6. Mechanism as claimed in claim 3, in which the slidable actuating member and the tool holder are each provided with a pair of abutments arranged so that movements of the actuating member in opposite directions cause opposite movements of the tool holder.

7. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder movable on the slide in a direction at right angles to the direction of motion of the slide, a rotatable master screw on the part carrying the slide, a follower mounted on the tool holder and engageable with the master screw, an actuating member carried by the slide and slidable in a

direction at right angles to the tool holder for advancing and retracting the tool holder, the latter and the actuating member being each provided with a pair of abutments arranged so that movements of the actuating member in opposite directions cause opposite movements of the tool holder, a cam on the master screw, and a stop on the part carrying the slide, the said cam and stop being adapted to impart opposite movements to the said actuating member.

8. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder carried by the slide and capable of tool-advancing and retracting movements relatively to the slide in a direction at right angles to the direction of motion of the slide, a rotatable master screw on the part carrying the slide, a follower mounted on the tool holder and engageable with the master screw by the tool-advancing movement of the tool holder, an actuating member carried by the slide and slidable in a direction at right angles to the tool holder for advancing and retracting the latter, a cam on the master screw and adapted to impart movement in one direction to the actuating member, a stop on the part carrying the slide, and a wedge piece slidably supported by the slide and adapted by contact with the stop to move the actuating member in the opposite direction.

9. A screw thread chasing mechanism comprising the combination with a slide, of a tool holder movable on the slide in a direction at right angles to the direction of motion of the slide, a rotatable master screw on the part carrying the slide, a follower mounted on the tool holder and engageable with the master screw, an actuating member carried by the slide and slidable in a direction at right angles to the tool holder for advancing and retracting the tool holder, the latter and the actuating member being provided with complementary abutments which by their interaction serve to impart movement to the tool holder from the said member, a spring for opposing advance movement of the tool holder by the actuating member, a cam provided on the master screw and adapted to act on one end of the actuating member for advancing the tool holder, and a stop mounted on the part carrying the slide and adapted by acting either directly or indirectly on the other end of the actuating member to cause the tool holder to be retracted.

HORACE ADCOCK.