

Oct. 22, 1940

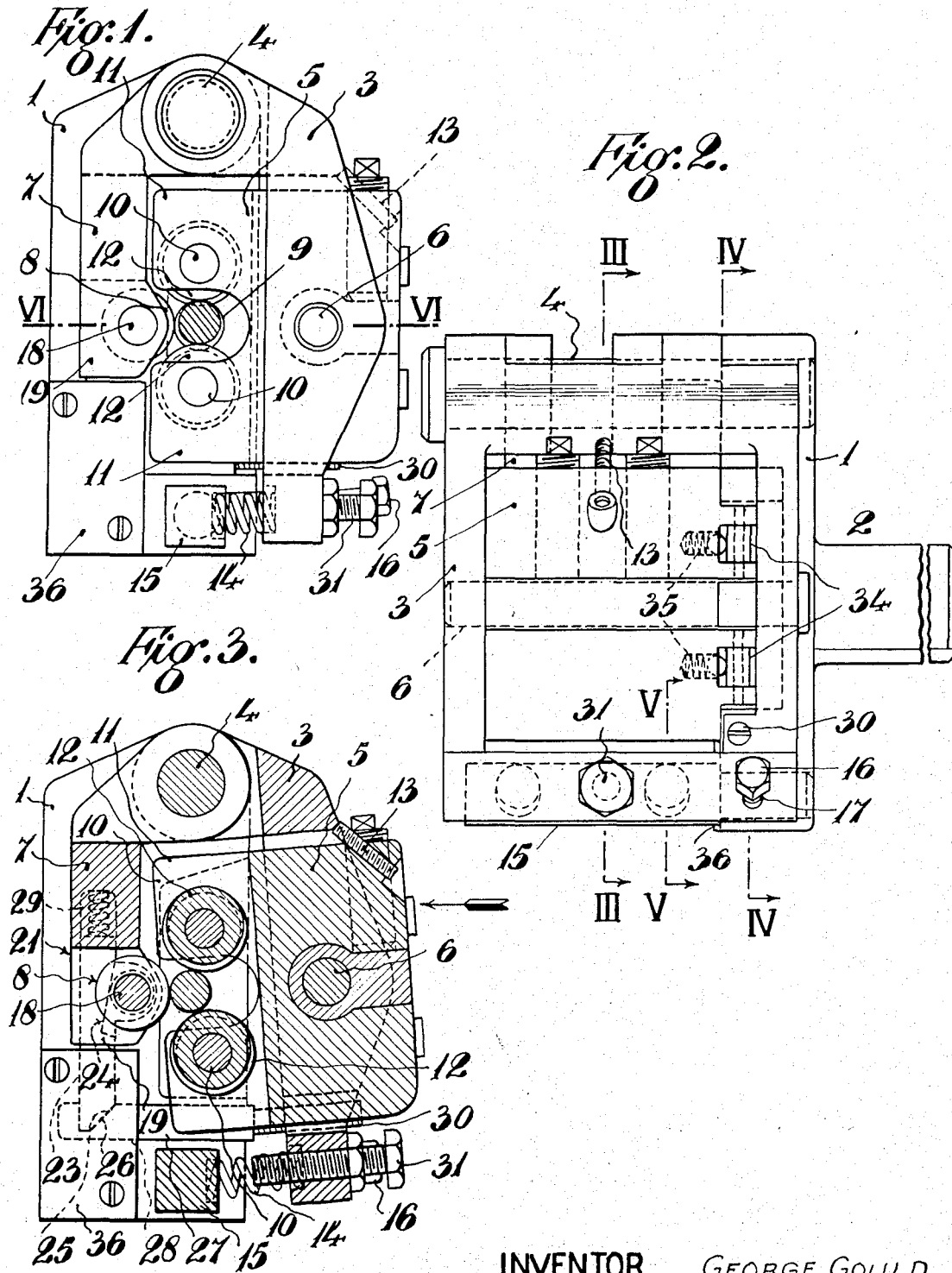
G. GOULD

2,218,574

APPLIANCE FOR ROLLING SCREW THREADS

Filed Jan. 10, 1940

3 Sheets-Sheet 1



INVENTOR GEORGE GOULD

BY

*Richard & Seier*  
ATTORNEY

Oct. 22, 1940.

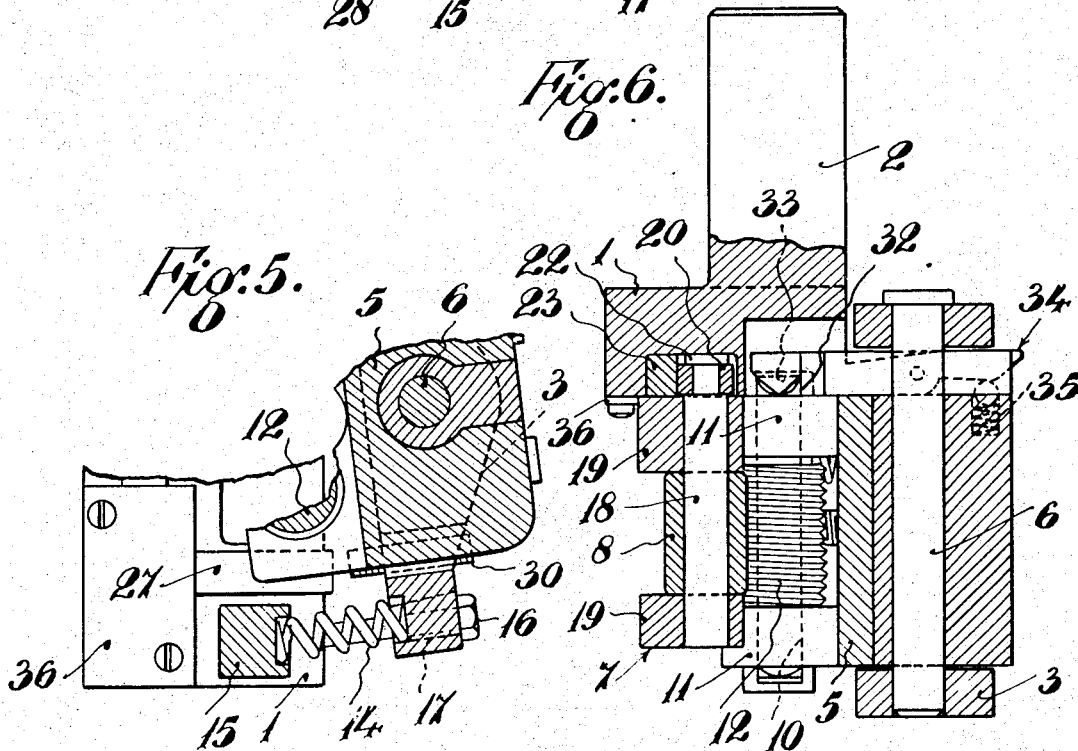
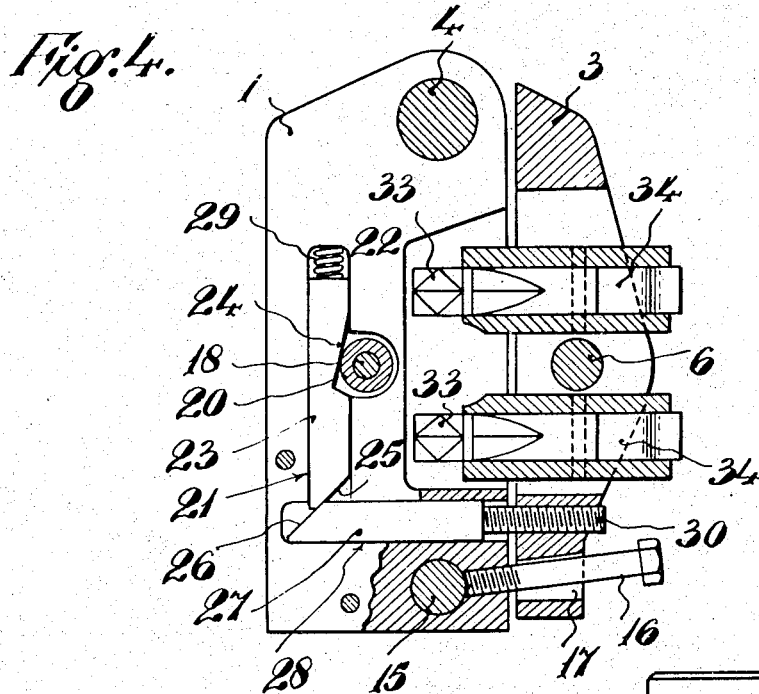
G. GOULD

2,218,574

APPLIANCE FOR ROLLING SCREW THREADS

Filed Jan. 10, 1940

3 Sheets-Sheet 2



*Fig. 6.*

INVENTOR

GEORGE GOULD

BY

*Richardson Seier*  
ATTORNEY

Oct. 22, 1940.

G. GOULD

2,218,574

APPLIANCE FOR ROLLING SCREW THREADS

Filed Jan. 10, 1940

3 Sheets-Sheet 3

Fig. 7.

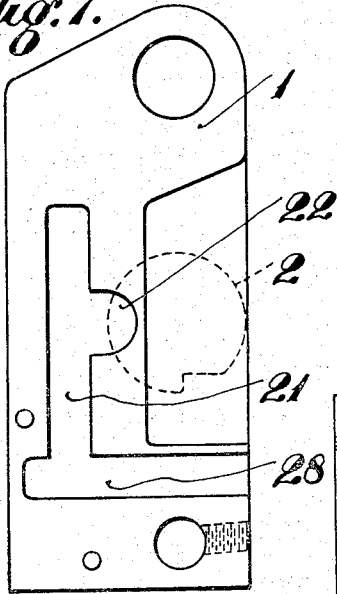


Fig. 8.

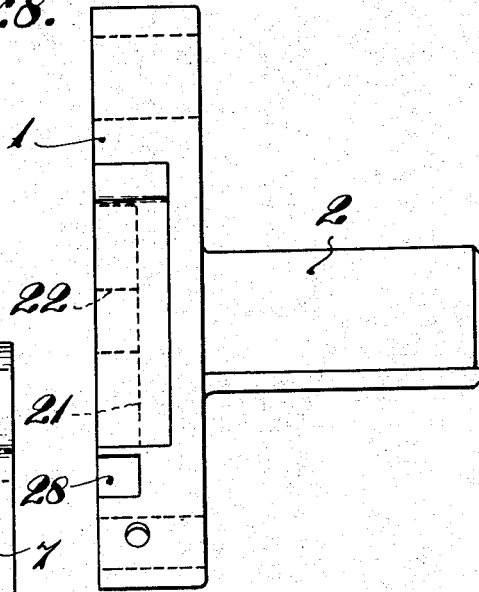


Fig. 10.

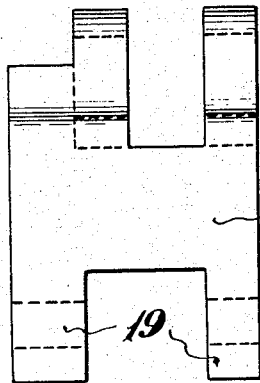


Fig. 9.

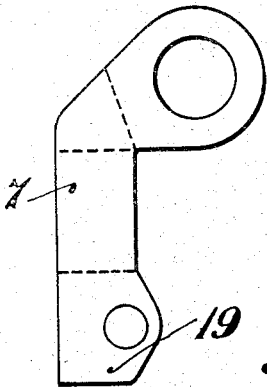


Fig. 11.

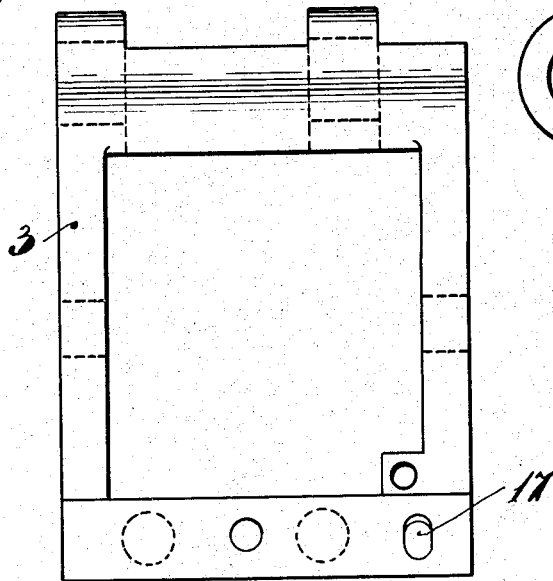
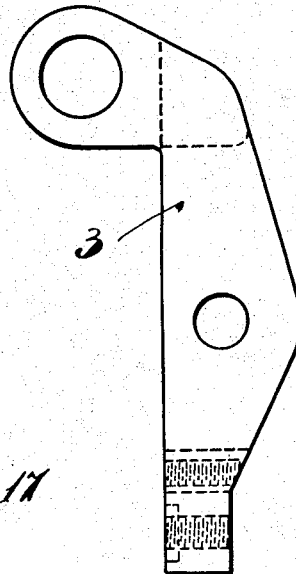


Fig. 12.



INVENTOR

BY

GEORGE GOULD

*Richard & Giles*  
ATTORNEY

# UNITED STATES PATENT OFFICE

2,218,574

## APPLIANCE FOR ROLLING SCREW THREADS

George Gould, Birmingham, England, assignor to  
Wolseley Motors Limited, Birmingham, England

Application January 10, 1940, Serial No. 313,199  
In Great Britain November 24, 1939

10 Claims. (Cl. 80—6)

This invention relates to tools or appliances for rolling screw threads on revolving work-pieces, being of the kind comprising a plurality of threaded rolls rotatably mounted upon a holder or support and adapted to be engaged with the work so as to roll a screw thread in the surface thereof. Thread-rolling tools or appliances of the above kind are described and claimed in my application No. 285,546.

When the work-piece is of small diameter the applied pressure of the threading rolls tends to force the said work-piece laterally out of position. There is difficulty in using a rigid stop device for supporting the work against such displacement, as it is usual for that part of the work on which the thread is required, to be initially formed to a diameter which is substantially that of the pitch diameter of the finished thread, the rolling operation causing the diameter to increase up to that of the finished thread; and it is necessary for the stop to allow for such increase.

The object of the present invention is to provide, in a thread-rolling tool or appliance of the kind referred to, a stop device, for positively supporting the work against lateral displacement, which is automatically varied in its location as the diameter of the work increases, whereby it will maintain an effective support for the work throughout the threading operation.

According to the invention, a tool or appliance, of the kind referred to, for rolling screw threads, includes a rigid stop or steady device for engaging the work and for supporting it against lateral displacement, and means operated by the traverse of the threading rolls across the work for automatically varying the position of said stop or steady device, as the diameter of the work increases, whereby it will maintain an effective support for the work throughout the threading operation.

The invention will be more clearly understood as the specification proceeds and when taken in conjunction with the accompanying drawings which illustrate a preferred embodiment thereof. It will be understood, however, that this description and illustration are given by way of example only and not by way of limitation. The invention may lend itself to a variety of expressions within the scope of the appended claims.

Figure 1 of the accompanying drawings is a front elevation of a thread-rolling tool or appliance in accordance with the present invention, showing the threading rolls just completing the threading of the work.

Figure 2 is a side elevation.

Figure 3 is a cross-section on line III—III, Figure 2, showing the threading rolls about to commence the threading operation.

Figure 4 is a cross-section on line IV—IV, Figure 2.

Figure 5 is a cross-section on line V—V, Figure 2.

Figure 6 represents a horizontal section on line VI—VI, Figure 1.

Figure 7 is a front elevation, and

Figure 8 is a side elevation of the stationary holder or body part of the tool.

Figure 9 is a front elevation, and

Figure 10 is a side elevation of the lever carrying the steady device.

Figure 11 is a side elevation, and

Figure 12 is a front elevation of the swinging frame that carries the threading-roll block.

Referring to the said drawings, the improved tool or appliance comprises a stationary holder or body part 1 provided at its rear with a projecting shank 2 by which it can be fixed in the turret of a lathe or the like; a laterally swinging frame or lever 3 freely pivoted at its upper end upon a horizontal pin 4 projecting from the front face of the holder 1; a threading-roll carrier or block 5 pivoted within the frame 3 upon a horizontal pin 6 carried between the sides thereof; and a lever 7 mounted upon the pin 4 and carrying a steady or thrust roller 8 for supporting the work-piece 9 during the threading operation.

The threading-roll block 5 is substantially of the construction described in my application No. 285,546, the same supporting a pair of vertically-spaced horizontal pins 10, 10, mounted to revolve in spaced side cheeks 11 of the block and rigidly carrying threading rolls 12, 12. The block 5 is adapted to be moved laterally to press the rolls 12 against the revolving work 9 in order to cause a screw thread to be rolled thereon, and for this purpose a suitable part on the cross-slide of the machine (not shown) is arranged to engage the back of the frame 3 which carries the block 5, the latter swinging upon the pin 4. Turning of the block 5 relatively to the frame 3 may be limited by an adjustable stop pin 13. The threading rolls are normally held retracted from the work-piece 9 by springs 14, 14, interposed between the lower end of the frame 3 and a bar 15 projecting forwardly from the face of the body part 1, while a stop screw 16 carried by the side of the body part 1 and passing through a slot 17 in the frame 3, restricts the outward movement of said frame and block 5 under the influence of the springs 14. An adjustable screw 31 carried by the lower part

of frame 3 and co-operating with the bar 15, serve to limit the inward movement of the frame 3, being adjusted so as to arrest the traverse of the rolls 12 across the work after the termination of the threading operation, namely, as soon as the axes of the said rolls and the axis of the work-piece 9 lie in the same plane, as indicated in Figure 1.

The work-piece is supported against lateral displacement during the threading operation by the steady or thrust roller 8 on lever 7 hereinbefore referred to, the said roller being freely mounted upon a pin 18 supported between jaws 19, 19, of the lever. As the work-piece is initially a plain rod having a diameter equal to that of the pitch diameter of the finished thread, the diameter of the said work-piece will increase as the rolling operation progresses, and provision is therefore made for automatically adjusting the position of the roller 8 throughout the threading operation, so that it will at all times maintain an effective support for the work and allow for the progressive increase in the diameter. To achieve this result, one end of the roller 5 pin 18 projects beyond the side of the jaw 19 which is adjacent the holder or body part 1 and on this projecting end a roller 20 is freely mounted. The corresponding front face of the holder 1 is formed with a vertical guide-way 21 0 having a lateral recess or housing 22 that receives the roller 20, and in the guide-way 21 is a sliding abutment bar 23 having, opposite to the roller 20, a tapered recess 24 the sloping surface of which forms an abutment for the said roller. The lower end of the bar 23 is bevelled or mitred at 25 and engages the similarly bevelled or mitred inner end 26 of a horizontal slide 27 mounted in a horizontal guide-way 28 in the lower part of holder 1. A spring 29 in the 10 upper part of the guide-way 21 acts upon the bar 23 in order normally to lower it so that the upper portion of the inclined surface of recess 24 is opposite to the roller 20, said portion of the surface maintaining the roller close to the work at the commencement of the threading operation. The swinging frame 3 carries, at its lower part, an adjustable thrust screw 30 which, at the commencement of the threading operation, just engages the outer end of the horizontal slide 27 50 while the roller 20 is engaging the upper end of the tapered recess 24. As the threading-roll block 5 moves inwards during the threading operation, the screw 30 on frame 3 progressively thrusts the slide 27 inwards, the co-operation of the bevelled surfaces 25, 26, causing the abutment bar 23 to be correspondingly raised and progressively bringing a deeper portion of the recess 24 opposite to the roller 20, thus permitting the steady roller 8 to move outwards to an extent corresponding to the increase in the overall radius of the work-piece 9. At all times the tapered surface of recess 24 maintains a positive support for the work-piece as the diameter of the latter increases. The amount of movement of the sliding abutment bar 23 and the degree of taper of the recess 24 are designed to allow an outward movement of steady roller 8 which corresponds throughout the threading operation with the increase in diameter of the work-piece. 70 At the conclusion of the operation the sliding abutment bar 23 and the slide 27 are returned to their initial positions by the action of the spring 29. A cover plate 36 serves to retain the bar 23 and slide 27 in their guide-ways.

75 In the arrangement described, the tool is de-

signed for mounting in the turret of the machine, and in operation the turret is moved lengthwise of the work-piece until the threading-rolls are in position for operating on the work. The cross-slide of the machine is then moved laterally to engage the roll frame 3 and press the rolls against the revolving work-piece, the operation being completed when the stop 31 engages the bar 15. While the tool described is arranged for mounting in a turret machine, the invention is not confined to tools for use in such machines.

As shown, the tool may embody the threading-roll locating means described and claimed in my application No. 285,546, the ends of the roll pins 15 10, 10, having V-shaped ends 32 engaged by V-shaped recesses 33, in the ends of levers 34 acted upon by springs 35.

I claim:

1. An appliance for rolling a screw thread on 20 a work-piece comprising a roll support movable towards the work, a pair of spaced screw-threaded rolls rotatably mounted upon the support, a rigid steady device for engaging and supporting the work, and means operated by the 25 traverse of the rolls across the work for automatically varying the position of said steady device, as the diameter of the work increases, whereby it will maintain an effective support for the work throughout the threading operation. 30

2. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a movable steady device for supporting the work against lateral displacement, a movable abutment mounted on the stationary holder for supporting the steady device against outward movement, and means operated by the movement of the roll carrier relatively to the holder for automatically controlling the abutment so as to allow the steady device progressively to move outwards to an extent corresponding to the progressive increase in diameter of the work, whereby it will maintain an effective support for the said work throughout the threading operation. 45

3. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a movable steady device for supporting the work against lateral displacement, a movable abutment mounted on the stationary holder and having a shaped controlling surface co-operating with the steady device to support the latter against outward movement, and means operated by the movement of the roll carrier relatively to the holder for moving said abutment to cause a different portion of the controlling surface to co-operate with the steady device as the threading operation proceeds. 55

4. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a movable steady device for supporting the work against lateral displacement, an abutment slide guided in a vertical direction on the stationary holder and having a cam surface co-operating with the steady device, and means operated by the movement of the roll carrier relatively to the holder for moving said abutment slide to cause a different portion of the cam surface to co-operate with the steady device 75

and thereby allow the latter to move outwards to an extent corresponding to the increase in the diameter of the work during the threading operation.

5 5. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a movable steady device for supporting the work against lateral displacement, an abutment slide movable in a vertical guideway in the stationary holder and having a controlling recess in one side for co-operation with the steady device, a spring acting on the slide tending to depress it, and a transverse slide mounted in a guideway in the holder and operated by the movement of the roll carrier relatively to the holder, the inner end of said transverse slide co-operating with the lower end of the vertical slide to cause the latter to be raised as said transverse slide is moved inwards, whereby the steady device is allowed to move outwards to an extent corresponding to the increase in the diameter of the work during the threading operation.

25 6. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a lever pivoted upon the stationary holder for movement towards and away from the work, a steady device carried by the lever for supporting the work against lateral displacement, a movable abutment mounted on the stationary holder and having a shaped controlling surface co-operating with the steady device to support the latter against outward movement, and means operated by the movement of the roll carrier relatively to the holder for moving said abutment to cause a different portion of the controlling surface to co-operate with the steady device as the threading operation proceeds.

40 7. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a lever pivoted upon the stationary holder for movement towards and away from the work, a steady device carried by the lever for supporting the work against lateral displacement, an extension of the steady device projecting laterally from the lever, a movable abutment mounted on the stationary holder and having a cam controlling surface co-operating with the extension of the steady device to support the latter against outward movement, and means operated by the movement of the roll carrier relatively to the holder for moving said abutment to cause a different portion of the controlling surface to co-operate with said extension of the steady device as the rolling operation proceeds.

8. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a roll carrier movable relatively to said holder, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a lever pivoted upon the stationary holder for movement towards and away from the work, a pin carried by the lever and projecting laterally from the latter, a steady roller mounted on the pin for supporting the work against lateral displacement, an abutment slide guided on the stationary holder and having a cam surface co-operating with the projecting end of the pin, and means operated by the movement of the roll carrier relatively to the holder for moving said abutment slide to cause a different portion of the cam surface to co-operate with the said pin and thereby allow the steady roller to move outwards to an extent corresponding to the increase in the diameter of the work during the threading operation.

9. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a swinging lever hinged at its upper end to the holder for movement towards and away from the work, a roll carrier pivoted to said lever, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a second lever pivoted upon the holder, a steady device on the said second lever for supporting the work against lateral displacement, a movable abutment on the holder for supporting the steady device against outward movement, and means actuated by the swinging lever for automatically operating the abutment so as to allow the steady device progressively to move outwards to an extent corresponding to the progressive increase in diameter of the work.

10. An appliance for rolling a screw thread on a work-piece comprising a stationary holder, a swinging lever hinged at its upper end to the holder for movement towards and away from the work, a roll carrier pivoted to the lever, a pair of spaced screw-threaded rolls rotatably mounted upon the carrier, a second lever pivoted upon the holder, a steady device on the said second lever for supporting the work against lateral displacement, an abutment slide movable in a vertical guideway in the stationary holder and having a controlling cam surface for co-operation with the steady device, a spring acting on the slide to depress it, a transverse slide mounted in a guideway in the holder and co-operating with the vertical slide to cause upward movement of the latter when pressed inwards, a projecting part carried by the swinging lever which, when the threading rolls engage the work, exerts pressure on the transverse slide to cause the vertical slide to move upwards and allow the steady device to move outwards as the threading operation progresses.

GEORGE GOULD.