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B. M. W. HANSON.

FEED ADJUSTING DEVICE FOR THE CROSS SLIDES OF METAL WORKING MACHINES.

APPLICATION FILED DEC. 19, 1904.

Fig. 1.

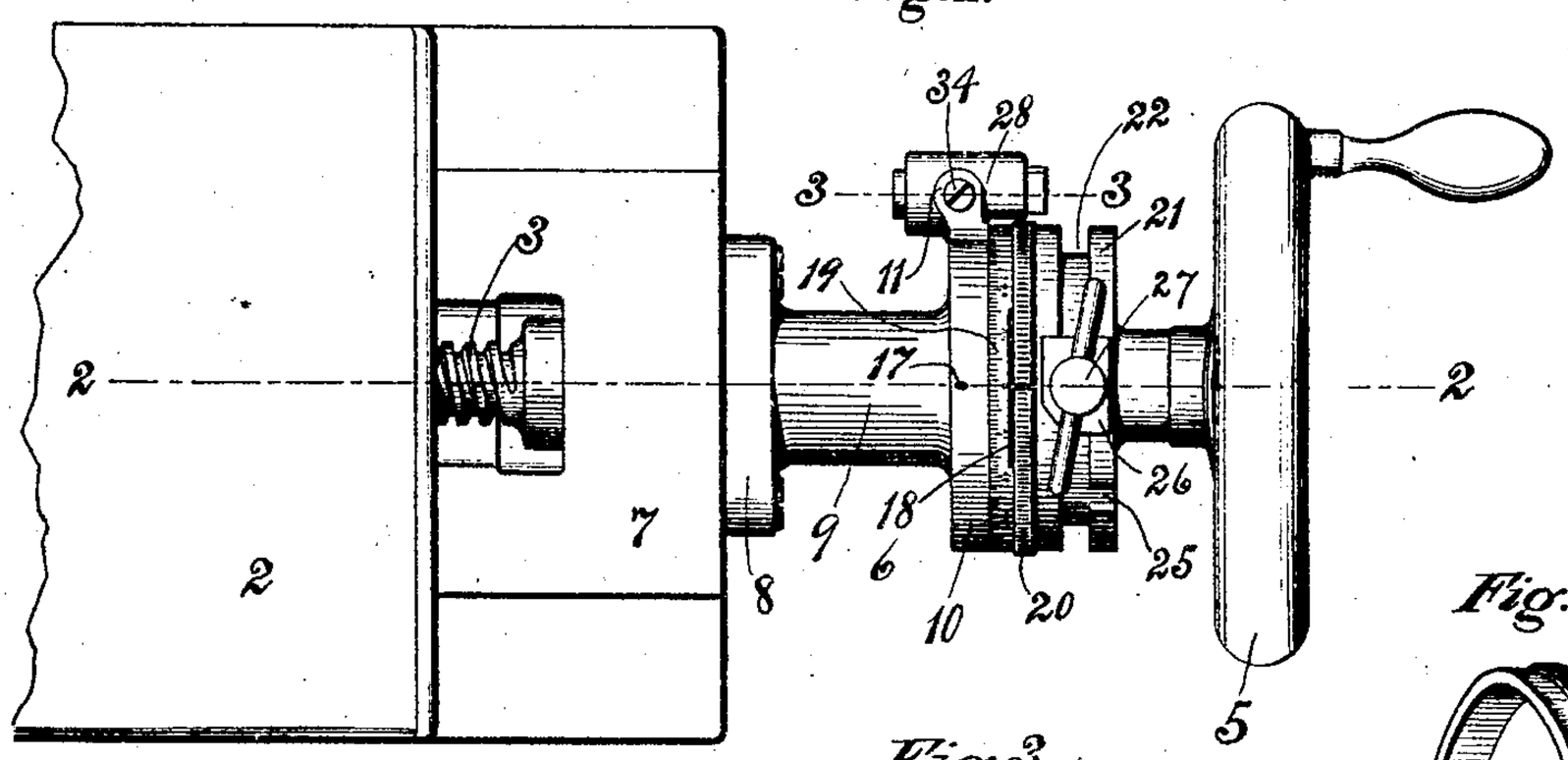


Fig. 3.

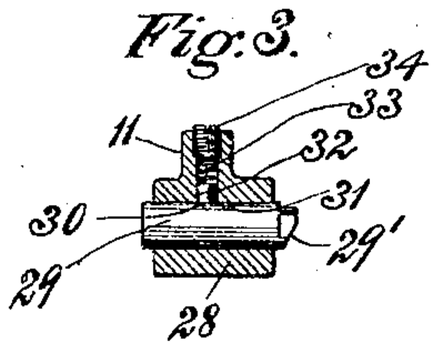


Fig. 5.

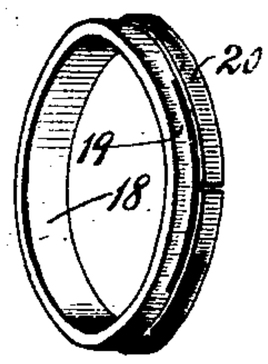
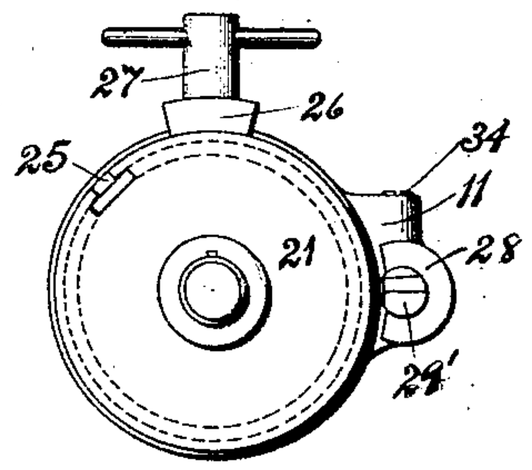


Fig. 4.



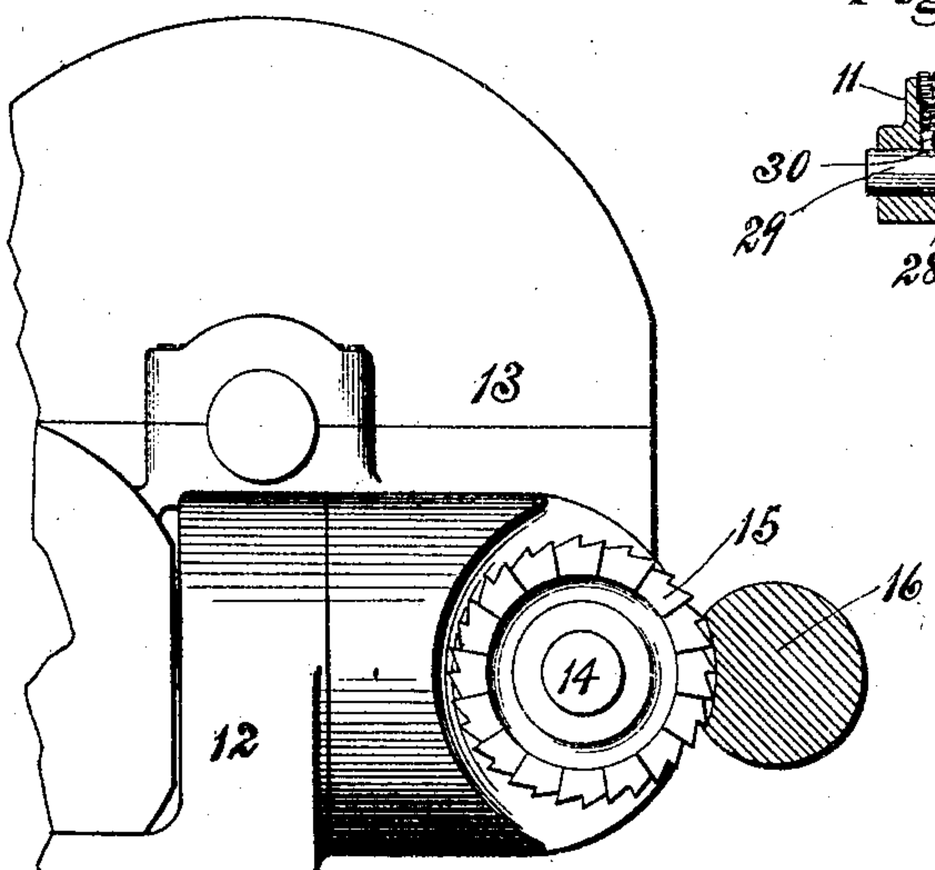
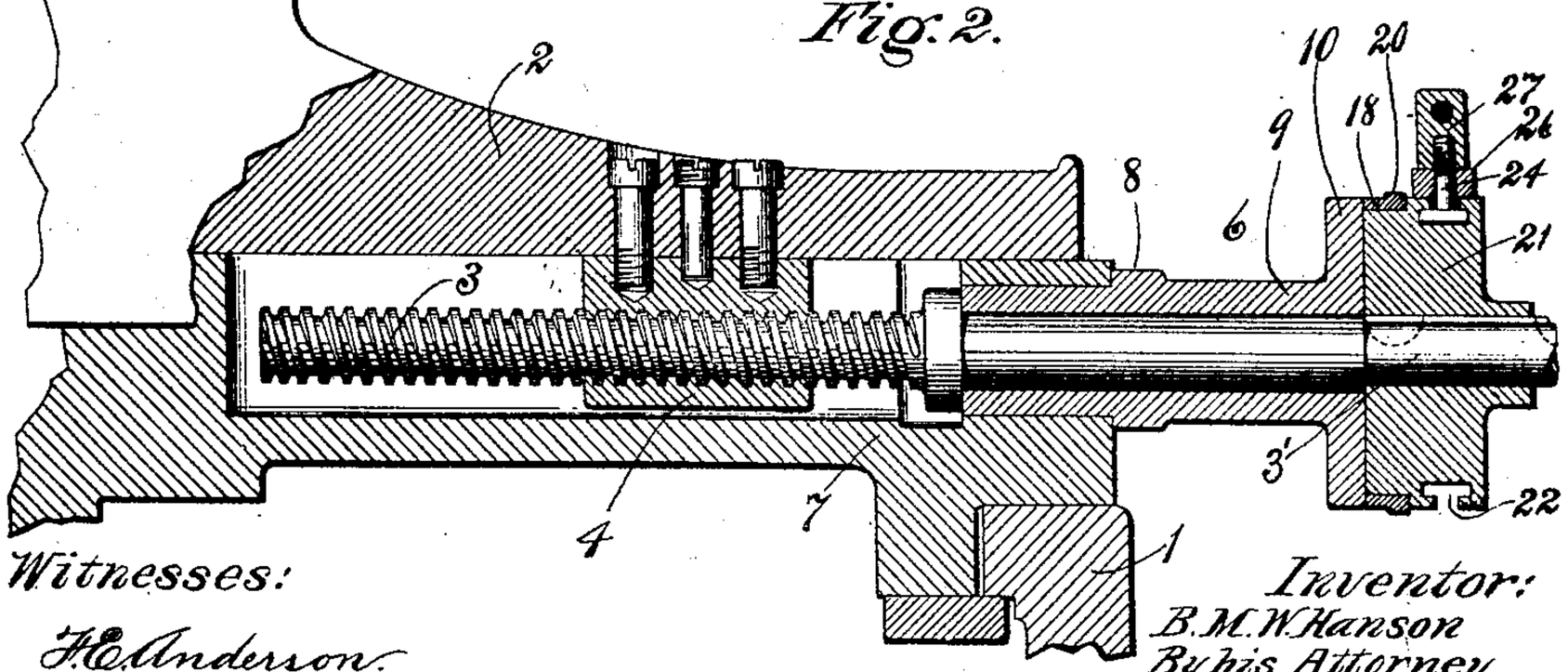


Fig. 2.



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UNITED STATES PATENT OFFICE.

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FEED-ADJUSTING DEVICE FOR THE CROSS-SLIDES OF METAL-WORKING MACHINES.

No. 814,649. Specification of Letters Patent. Patented March 6, 1906.

Application filed December 19, 1904. Serial No. 237,545.

To all whom it may concern:

Be it known that I, BENGT M. W. HANSON, a citizen of Sweden, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Feed-Adjusting Devices for the Cross-Slides of Metal-Working Machines, of which the following is a specification.

This invention relates to devices for controlling the feed movement of a cross-slide in such a way that the tool may be set to an exact point and may be returned to said point, thereby enabling the work of adjustment to be accomplished in a quick and reliable manner without the usual prolonged delay.

While the invention may be applied to the feed-screw of a cross-slide of any metal-working machine, it is shown employed with the screw for actuating the cross-slide of a thread-milling machine, said slide carrying a driven shaft upon which the thread-cutting tool is mounted.

Primarily the object of the invention is the provision of an adjustable stop which will limit the extent to which the screw for actuating the cross-slide may be turned and will positively prevent the entrance of the tool into the work beyond a certain point, whereby the work may be cut to predetermined depth and no farther and precisionized replicas of said work may be accurately produced.

A further object of the invention is the provision, in connection with the cross-slide screw, of stop and gaging devices under control of the mechanic, so that a thread of any desired depth may be produced and exact duplicates of said thread may readily be formed.

Other objects of the invention will hereinafter be set forth.

In the accompanying drawings, Figure 1 is a plan view of the cross-slide, partly broken away, of a metal-working machine, showing the screw and my invention applied to said screw. Fig. 2 is a view partially in longitudinal vertical section on line 2 2 of Fig. 1. Fig. 3 is a longitudinal vertical section on line 3 3 of Fig. 1. Fig. 4 is a front elevation of the improved stop device with the hand-wheel removed, and Fig. 5 is a perspective view of the split gage-ring.

Like numerals designate similar parts throughout the several views.

Referring to the drawings, the numeral 1 designates the bed of a metal-working machine; 2, the cross-slide thereof; 3, the feed-screw; 4, the nut in which said feed-screw works, and 5 the hand-wheel by which the screw is turned, all of these parts being of usual construction.

Designated generally by 6 is a tubular bearing for the cross-slide screw, said bearing being inserted at one end in an opening of the carriage, and secured to said carriage by bolts passing through a flange 8 thereof. Beyond said flange 8 the bearing is enlarged to form a barrel 9, terminating at its end in a plate 10, said plate being provided with an extension 11 for a purpose hereinafter mentioned.

Rising from the cross-slide 2 are bearing-standards 12 (one being illustrated) for the reception of the trunnions (not shown) of an angularly-adjustable frame 13, in which is journaled a shaft 14, carrying a milling-cutter 15, employed in threading work 16, which is to be supported and rotated in the usual way.

Plate 10 of bearing 6 is provided with a zero-mark 17 to coöperate with a split ring 18, having a graduated surface 19 and a knurled periphery 20, adjacent to said graduated surface.

Keyed to the feed-screw shaft 3′ adjacent to plate 10 is a head or carrier 21, having a circumferential T-shaped groove 22, and on a reduced part of this head adjacent to the plate 10 the graduated ring 18 is mounted for arcuate adjustment, as shown in Figs. 1 and 2, said ring in virtue of its yielding character being held normally stationary on the carrier, but being capable of adjustment around the same. Fitted in the circumferential groove 22 of carrier 21 is the T-shaped head of a bolt 24, a flange of the carrier being T-grooved at 25 to permit of the entrance of said bolt. Loose on the bolt is a shoe 26, concave on its under side to fit the periphery of the head, and engaging the thread of said bolt is a nut 27, shown as a capstan-nut, although any other form of nut may be employed.

Projecting on each side of extension 11 of plate 10 is a tubular bearing 28 for the reception of a movable stop 29, having a beveled front end 29′. This stop 29 is provided with V-shaped notches 30 31 for the reception of the end of a detent 32, normally forced toward the stop by a spring 33, located in a chamber

of the bearing and the tension of which may be regulated by a screw 34.

In the operation of the invention the screw 3 is manipulated by its hand-wheel 5 to advance the cross-slide 2 until the tool engages the work, and the split ring 18 is turned on its carrier 21 until the zero-marks of the ring and plate 10 coincide, after which the slide is advanced until the tool has entered the work to the desired depth, as indicated by the graduated surface of the ring. Further motion of the screw is now arrested, the nut 27 is loosened, and said nut, the bolt 24, and shoe 26 are adjusted over the surface of the carrier 21, the T-head of the bolt sliding in the circumferential groove 22 until the shoe engages the inner flat side of the movable stop 29, when the nut is tightened to clamp the parts rigidly in place. Now by retracting the screw the cross-slide will be withdrawn, and when the shoe 26 engages the beveled end 29′ of the stop 29 said stop 29 will be forced back until the detent 32 snaps into the notch 31 thereof, and thus retains it in withdrawn position. To set the parts for producing a precisionized duplicate of the work, the screw is again manipulated as before until the cutting-surface of the tool touches the new work, and the stop 29 is pushed in until the detent snaps into notch 30 of said stop, thus holding it in projected position to form a positive abutment for limiting the advance of the cross-slide and its tool in the manner before described. In this way exact duplicates (no calipering being necessary) of any work desired may be formed in milling, turning, and other metal-working machines, the invention not being limited in use to the machine described.

Various changes may be made in the constructional details of the parts, the invention not being limited to the precise devices shown and described.

Having thus described my invention, what I claim is—

1. The combination, with a support, and with a slide thereon, of a screw for actuating said slide; a bearing projecting from the support, said bearing having a head provided with a graduation; a carrier connected to the screw; a stop adjustable circumferentially of said carrier; and a graduated ring also adjustable circumferentially of the carrier, and located adjacent to the head of the bearing.

2. The combination, with a support, and with a slide movable thereon, of a tubular bearing projecting from the support, and having a head provided with a graduation; a carrier rigid with the barrel of the screw adjacent to said head; a graduated ring adjustable circumferentially of the carrier; a stop also adjustable circumferentially of the carrier; and a movable stop carried by the head, and coöperating with the stop of the carrier.

3. The combination, with a support, of a bearing having an indicating-mark; a screw journaled in said bearing; a slide on the support, and actuated by the screw; a grooved head rigid with the screw; a split ring adjustable circumferentially of the head, said ring being graduated; a stop adjustable in the groove of the head; and a stop slidably mounted on the bearing.

4. The combination, with a support, of a cross-slide thereon; a screw for actuating said cross-slide; a bearing projecting from the support, and in which the barrel of the screw is journaled, said bearing having a plate at its outer end provided with an indicating-mark; a bearing projecting from the plate; a pin provided with notches and having an inclined end mounted for sliding movement in the bearing of the plate; a detent for engaging the notches and locking the pin; a graduated split ring; a head rigid with the barrel of the screw, and over which said split ring is adjustable; and a stop circumferentially adjustable on the head.

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

BENGT M. W. HANSON.

Witnesses:

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JOSEPH W. ANDREWS.