

APPLICATION FILED NOV. 5, 1910.

2 SHEETS—SHEET 1.

FIG. 1.



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MICROMETER FEED FOR TOOLS.
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1,066,166.

Patented July 1, 1913.

2 SHEETS-SHEET 2.

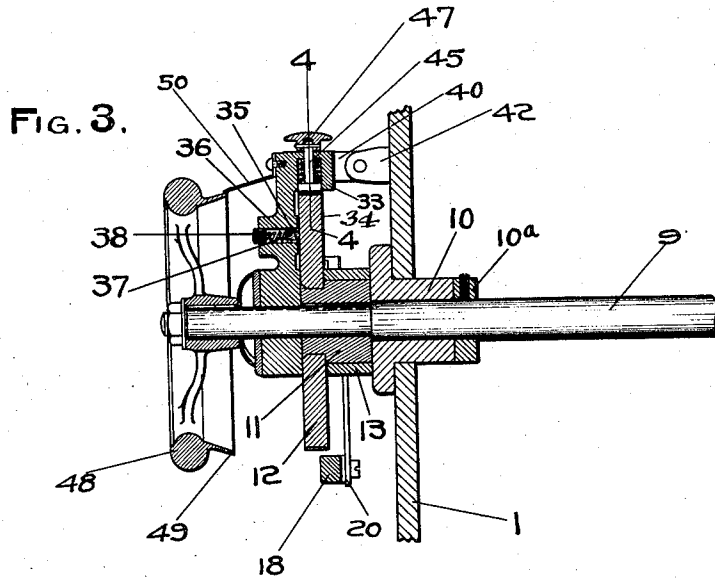
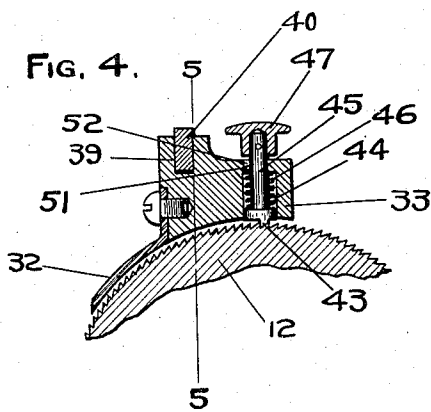
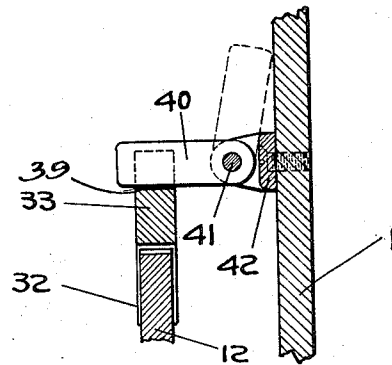


FIG. 5.

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UNITED STATES PATENT OFFICE

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MICROMETER-FEED FOR TOOLS.

1,066,166.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES G. TREFETHEN, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Micrometer-Feeds for Tools, of which the following is a specification.

This invention relates to micrometer feeds for tools, and consists in certain improvements in the construction thereof as will be hereinafter fully described and pointed out in the claims.

The invention is particularly designed for use on grinding machines, and as shown, is applied to such a machine.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a plan view of a part of a grinding machine, parts of the table frame being broken away to show the construction. Fig. 2 shows a side elevation of a part of a grinding machine, showing the micrometer feed attachment. Fig. 3 a section on the line 3—3 in Figs. 1 and 2. Fig. 4 a section on the line 4—4 in Fig. 3. Fig. 5 a section on the line 5—5 in Figs. 1 and 2.

1 marks the frame of the machine, 2 the sliding table, 3 a portion of the cross feed frame, 4 a rack on said frame, 5 a gear meshing the rack 4. The gear 5 is fixed on the shaft 6. The gear 7 is also fixed on this shaft and meshes the worm 8. The worm 8 is carried by the feed shaft 9. The shaft 9 is journaled in a bearing 10, carried by the frame, and is locked against outward movement by the collar 10^a. A collar 11 is fixed on the shaft outside of the bearing 10, thus locking the shaft against endwise movement in the opposite direction.

A ratchet wheel 12 is fixed on the collar 11. The automatic feed of the shaft 9 is effected through this ratchet wheel. The mechanism for feeding this is as follows: A ratchet arm 13 is journaled on the collar 11, and carries the pawl 14. A spring 15 is secured to the arm 13, engages a pin 16 on the pawl, and presses the pawl against the periphery of the ratchet wheel. The end of the spring is provided with a hook 17. It will be readily observed that when the pawl is thrown out to extreme position, the spring holds it in this outer position. On the other hand as shown in Fig. 2 the spring presses it against the ratchet wheel. A lever 18 is

pivoted on the frame by a stud 19. A link 20 connects the arm 13 with the lever 18. A lever 21 is journaled on the stud 21^a on the frame. It has the arms 22—22 which engage the screws 23—23 on the lever 18. It will be observed that if the lever 21 is rocked it will effect the downward movement of the lever 18, and consequently, the downward movement of the pawl arm 13, thus moving the ratchet wheel forward so as to rotate the shaft 9, and produce a feed movement. The lever 21 is connected by a link 24 with a lever 25. The lever 25 is journaled on the stud 26 carried by the frame. A gear segment 27 is fixed with the lever 25. The gear segment meshes a gear segment 28 fixed on a shaft 30. The lever 29 is also fixed on the shaft 30, and extends upwardly into the path of the adjustable stops 31 on the sliding table. The shaft 30 is connected with the reverse mechanism (not shown) which acts at the ends of the stroke of the table. The lever 29 is rocked with it and through the mechanism, just described the pawl arm 13 is rocked.

A lock out device 32 is carried by a head 33. The head 33 is carried by an arm 34 journaled on the shaft 9. The purpose of the lock-out device is to automatically throw out the pawl 14 when a pre-determined movement of the feed mechanism has been effected, so that duplicate pieces may be ground to size, and the machine automatically thrown out of action when the piece reaches this pre-determined size. The arm 34 has frictional engagement with the ratchet wheel through the friction plug 35 which is held in place in the socket 36. A spring 37 is arranged in the socket, and presses the plug. A screw 38 holds the spring in the socket.

The head 33 may be locked in a fixed position, especially where hand feeding is desired, by means of the swinging pawl 40, which can be swung into the notch 39 in the head. The pawl 40 is carried by a pin 41 on the bracket 42, and the bracket 42 is secured to the frame of the machine.

The space pawl 43 is carried in the socket 44 in a head 33, and is designed to engage the teeth on the ratchet wheel. The pawl has the stem 45 which extends through the head, and a spring 46 is arranged in the socket 44, and presses the pawl 43 into engagement with the ratchet teeth. A button

47 is fixed on the outer end of stem by means of which the pawl may be manually actuated.

A hand wheel 48 is fixed on the end of the shaft 9. It has a rounded surface on it which can be conveniently grasped by the operator, and also has a scale flange 49 extending inwardly from the rim of the wheel. A pointer 50 is secured on the head 33, and is adjacent to the scale 49, so that the position of the scale relatively to the pointer, and consequently to the head 33, may be readily ascertained.

The placing of the scale on the hand wheel is of great importance, because it places the scale out far enough to permit of an easy reading of it. To facilitate this, the flange 40 is tapered with the smaller end outwardly so that the upper part of the flange is approximately at right angles to the line of vision of the operator. By making the scale on the flange on the hand wheel, this convenience is attained, and at the same time the scale proper is not necessarily engaged by the hand of the operator, so as to in time dim the marking. The tapered surface of the flange also facilitates this, because if the operator should grasp the entire periphery of the wheel, including the flange, the scale surface would receive but little contact from the hand of the operator. The scale 49 conforms to the ratchet teeth, that is, there are the same number of marks on the scale that there are ratchet teeth, or one of these is the multiple of the other. Where the lock out device is set for a given diameter of the piece being ground, the position of the head relatively to the scale can be readily read, so that this size can be, with micrometer exactness, repeated. On the other hand, where it is desired to have hand feeding, the head 33 can be locked in a vertical position, and the movements of the hand wheel read by means of the scale. When the devices are used for hand feeding, the pawl 43 may be thrown out of engagement with the ratchet wheel and locked in this position by means of the pin 51 on the stem 45. This pin operates in a key slot 52, when the ratchet is locked in position in alinement with the path of the ratchet wheel. By lifting the pawl with a button 47 and turning it, the pin 51 is moved out of register with the key slot so as to lock the pawl in its outer position.

What I claim as new is:

1. In a micrometer feed for tools, the combination of a feed shaft; a ratchet wheel on said shaft; a hand wheel on said shaft; a scale on the hand wheel, the graduations on which correspond to the graduations formed by the ratchet teeth; and a pointer adjacent to the scale.

2. In a micrometer feed for tools, the combination of a feed shaft; a ratchet wheel on

said shaft; a hand wheel on the shaft, the wheel having a scale flange thereon; a scale on the flange, the graduations on which correspond to the graduations formed by the ratchet teeth; and a pointer adjacent to the scale.

3. In a micrometer feed for tools, the combination of a feed shaft; a ratchet wheel on said shaft; a hand wheel on said shaft, said wheel having a gripping rim thereon from the inner side face of which extends a scale flange, said flange being tapered with the smaller end attached next the wheel rim, said smaller end being of less diameter than said wheel rim; a scale on the flange, the graduations on which correspond to the graduations formed by the ratchet teeth; and a pointer adjacent to the scale.

4. In a micrometer feed for tools, the combination of a feed shaft; a ratchet wheel on said shaft; a ratchet pawl for operating the said wheel; automatic means for actuating the pawl; devices for locking the pawl; means for adjusting and locking said devices with relation to the ratchet wheel; a hand wheel on said shaft; a scale on the hand wheel the graduations on which correspond to the graduations formed by the ratchet teeth; and a pointer carried by said devices and adjacent to the scale.

5. In a micrometer feed for tools, the combination of a feed shaft; a ratchet wheel on said shaft; a ratchet pawl for operating the said wheel; automatic means for actuating the pawl; devices for locking the pawl; means for adjusting and locking said devices with relation to the ratchet wheel; a hand wheel fixed on said shaft, said hand wheel having a scale flange thereon, tapered with the smaller end outward; a scale on the flange, the graduations on which correspond with the graduations formed by the ratchet teeth; and a pointer carried by said devices and adjacent to the scale.

6. In a micrometer feed for tools, the combination of a frame; a feed shaft journaled thereon; a ratchet wheel on said shaft; a ratchet pawl; automatic means for actuating the pawl; devices for locking out the pawl; mechanism for adjusting and locking said devices with relation to the ratchet wheel; means for locking said devices with relation to the frame; a hand wheel fixed on the shaft; a scale on the hand wheel having graduations which correspond to the graduations formed by the ratchet teeth; and a pointer adjacent to the scale.

7. In a micrometer feed for tools, the combination of a frame; a feed shaft journaled thereon; a ratchet wheel on said shaft; a ratchet pawl; automatic means for actuating the pawl; devices for locking out the pawl; mechanism for adjusting and locking said devices with relation to the ratchet wheel; means for locking said devices with relation

to the frame; a hand wheel fixed on the shaft; a scale on the hand wheel having graduations which correspond to the graduations formed by the ratchet teeth, appliances for locking out said devices when said means are thrown out of action; and a pointer adjacent to the scale.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES G. TREFETHEN.

Witnesses:

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BLANCHE HARTMAN.