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A. SCRIVENER

2,091,655

CENTERLESS GRINDING MACHINE

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Fig. 1.

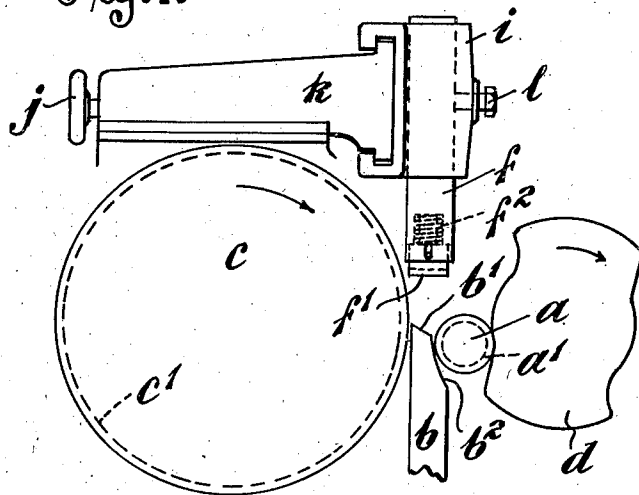


Fig. 2.

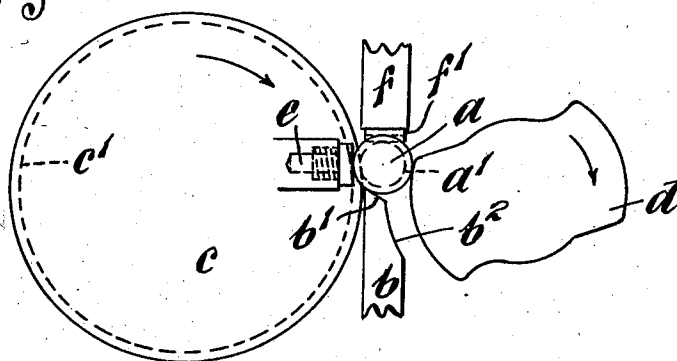
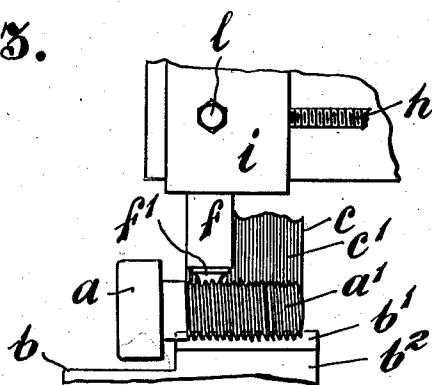


Fig. 3.



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UNITED STATES PATENT OFFICE

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CENTERLESS GRINDING MACHINE

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1 Claim. (Cl. 51—103)

This invention is for improvements in connection with centerless grinding machines, of the kind in which the work is supported on a rest and is mechanically rotated in pressure contact with a grinding wheel, and in which the work is presented to and withdrawn from the grinding wheel by means of or under control of a backing wheel or cam which also constitutes the work-rotating device.

The object is to provide a centerless grinding machine of this kind which shall be highly efficient and reliable in operation for the repetition grinding of screw-threaded bolts, studs, and other helically surfaced work, and which in particular shall ensure that the work is correctly aligned in relation to the grinding wheel before being brought into contact therewith.

According to the present invention, in a centerless grinding machine of the kind referred to, the screw-threads on the work are correctly aligned in relation to annular serrations on the grinding wheel by means of a radial control finger which is adapted for universal adjustment.

In order that the invention may be clearly understood and readily carried into practice, reference may be had to the appended explanatory drawing illustrating a convenient method of carrying the invention into effect, and in which:—

Figure 1 is a diagrammatic side elevation of a part of the machine showing the work fed into position on the rest in readiness for presentation to the grinding wheel.

Figure 2 is a similar view showing the work advanced into grinding position.

Figure 3 is a rear elevation with the work in grinding position but with the backing wheel or cam removed.

In the arrangement illustrated, the work *a* is supported during the grinding operation upon a rest *b* upstanding in close proximity to the grinding wheel *c*, which is formed with annular serrations *c'* adapted for accurate grinding of the profile of the screw-threads *a'* on the work, the rest *b* being inclined away from the grinding wheel *c* at the top as shown at *b'*, and having its upright rear face recessed in arcuate form as shown at *b''*.

The work *a* is movable laterally over this supporting rest *b*, towards and away from the grinding wheel *c*, under control of a backing wheel or cam *d* which is mounted behind the grinding wheel, preferably in such a manner as to be adapted for advancing and retracting movements in relation to the grinding wheel, in conjunction if desired with a spring-loaded guide *e* operating

in opposed relation to the cam. This backing wheel or cam *d* is shaped to feed the work *a* forwards over the supporting rest *b* from a loading position clear of the wheel *c* as shown in Figure 1, into a grinding position in contact with the wheel *c* as shown in Figures 2 and 3, then to rotate the work *a* through one revolution or more than one revolution with sufficient pressure to grind the surface being treated, and then to permit of the work *a* falling away from the grinding wheel *c*, this cycle of operations taking place twice during each revolution of the continuously rotating double-acting cam *d* illustrated. The backing wheel or cam however may be of a continuously rotating single-acting form, or may be arranged for oscillation in opposite directions alternately.

The backing wheel or cam *d* for presenting and rotating the work *a* operates in association with an adjustable control finger *f* abutting radially on the top of the work for ensuring correct alignment of the screw-threads *a'* on the work *a* with the annular serrations *c'* in the grinding wheel *c* before the work *a* touches the grinding wheel. This finger *f*, having a serrated tip *f'* which conforms substantially to the profile of the screw-threads *a'* on the work and which is preferably spring-loaded as shown at *f''*, is universally adjustable in relation to the work *a*, that is to say, it has a fine micrometer adjustment by screw *h* and slide block *i* in directions parallel to the axis of the grinding wheel *c*, and is also adjustable in two planes at right angles to the grinding wheel axis to suit various diameters of work *a* and grinding wheel *c*, the horizontal adjustment being effected by hand-wheel *j* and slide block *k*, and the vertical adjustment by sliding the finger within the slide block *i* under control of a locking stud *l*, the control finger *f* being also rotationally adjustable under control of said stud *l* for location of its serrations at the correct helix angle of the screw-thread being ground.

It will be seen that on the adjustable control finger *f* being initially set, the backing wheel or cam *d* provides for a continuous successional feed of work to the grinding wheel *c*. The work-rotating backing wheel or cam *d* together with the work-supporting rest *b* may be withdrawn from the grinding position whilst the work *a* is placed on the rest *b* in contact with the backing wheel or cam *d*. The whole unit carrying with it the work-piece *a* may then be advanced into the working position whilst the work is treated, and on completion be withdrawn again for unloading purposes. This cycle of operations may

be performed manually, or may be effected automatically in conjunction with a hopper or other work-feeding device.

I claim:

5 In a centerless grinding machine of the kind described, for the grinding of screw-threaded and other helically surfaced work, the combination of an annularly serrated grinding wheel, a rest adapted to support the work, a backing wheel
10 adapted to rotate the work upon said rest in

pressure contact with the grinding wheel and also to control the presentation and withdrawal of the work to and from the grinding wheel, and a serrated control finger abutting radially on the work upon said rest, said finger being adapted 5 for universal adjustment so as to ensure that the screw-threads on the work are correctly aligned in relation to the annular serrations on the grinding wheel.

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