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R. E. FLANDERS

1,847,337

TRUING MECHANISM FOR GRINDING WHEELS

Original Filed May 27, 1922 4 Sheets-Sheet 1

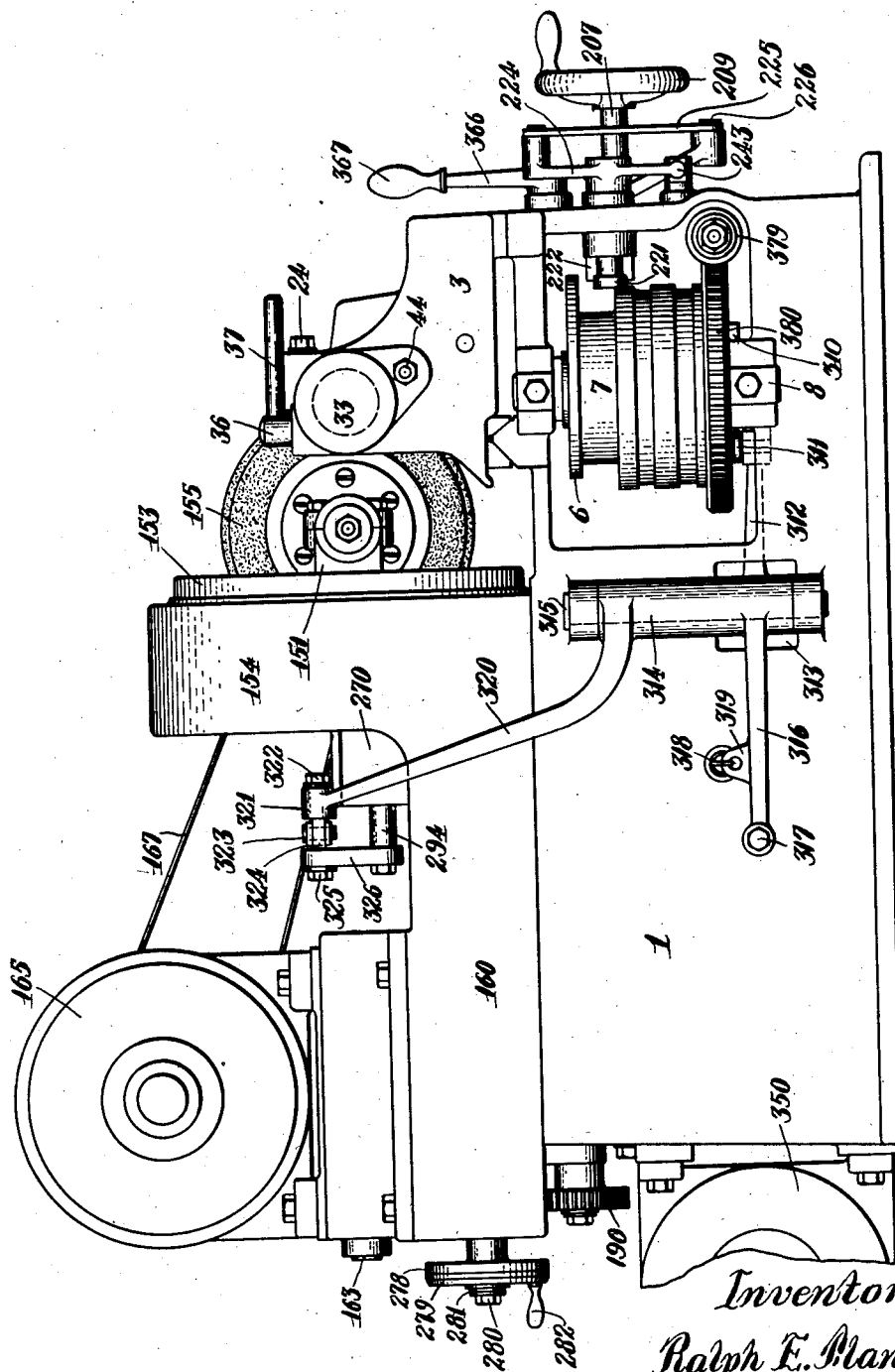


Fig. 1.

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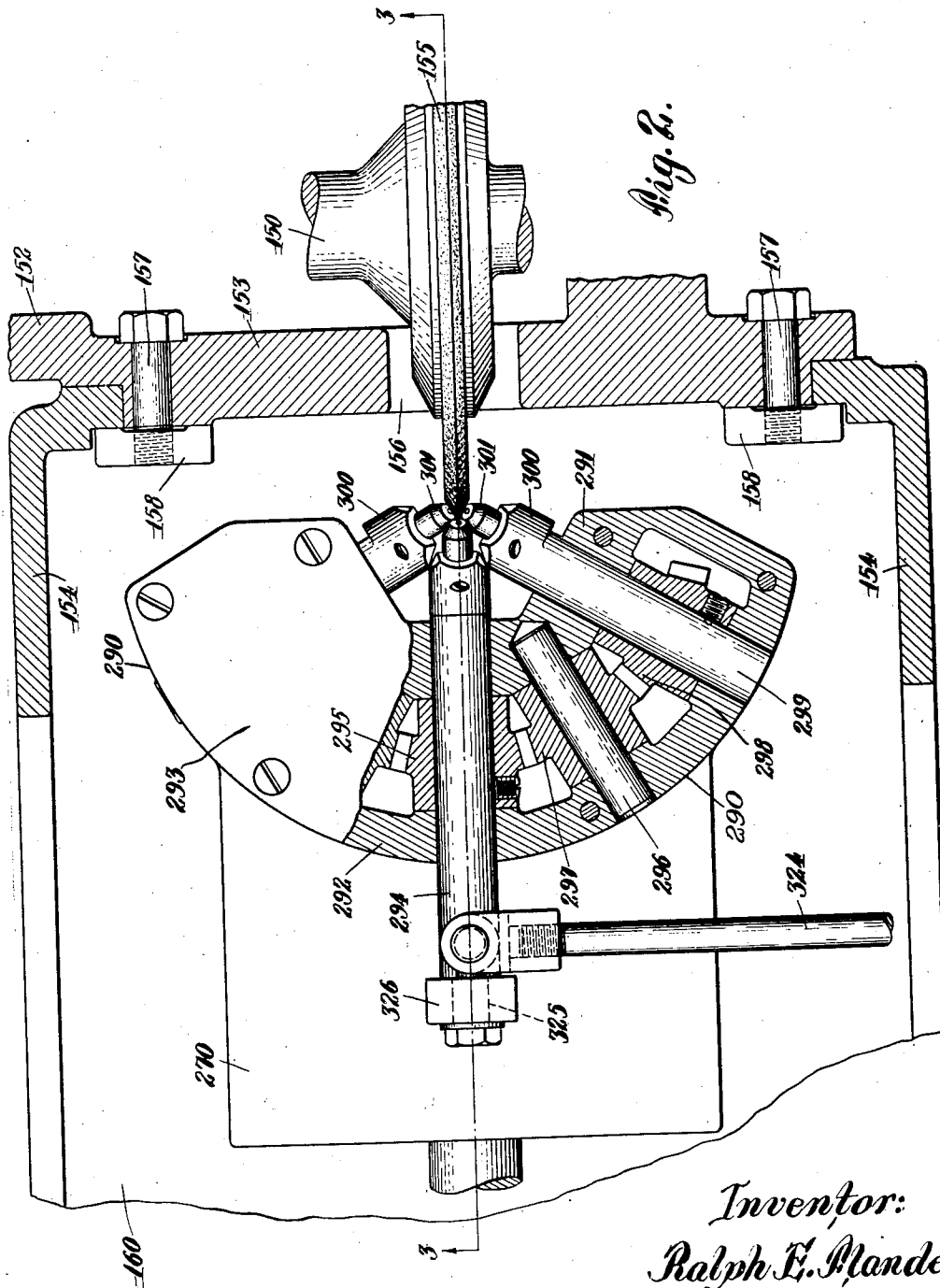
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4 Sheets-Sheet 2



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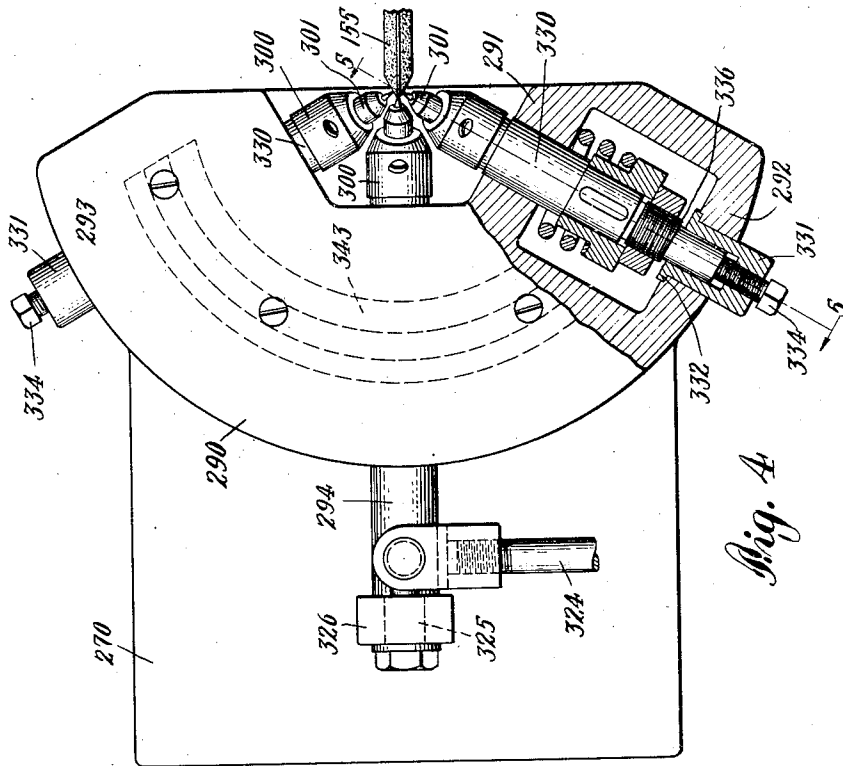


Fig. 4

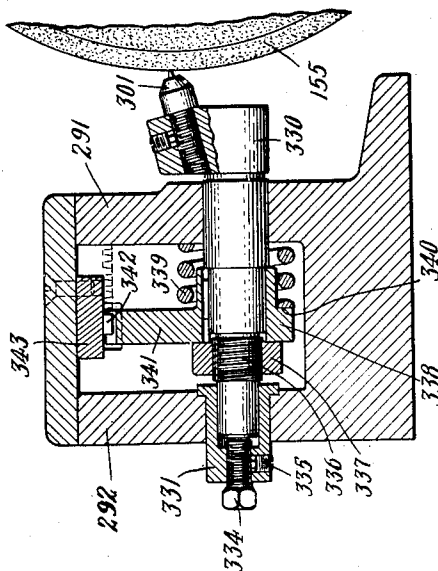


Fig. 5

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UNITED STATES PATENT OFFICE

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TRUING MECHANISM FOR GRINDING WHEELS

Original application filed May 27, 1922, Serial No. 564,091. Divided and this application filed August 25, 1927. Serial No. 215,279.

This application is a division of my application Serial No. 564,091, filed May 27, 1922, for grinding machines.

The invention relates to mechanism for truing a grinding wheel such as is used for grinding the threaded faces of taps. In order to produce accurate work with a grinding machine, it is necessary that the cutting faces of the grinding wheel be trued. It is an object of this invention to provide a novel and effective truing mechanism. For a full and complete disclosure of my invention, reference may be had to the following description and to the drawings, of which:—

Figure 1 is a side elevation of the grinding machine of which an embodiment of this invention is a part.

Figure 2 is a plan view, partly in section, of a portion of the machine shown in Figure 1, parts being broken away.

Figure 3 is a section on the line 3—3 of Figure 2.

Figure 4 is a fragmentary view, partly in section, of a modified embodiment of the invention.

Figure 5 is a section on the line 5—5 of Figure 4.

Referring to the drawings in detail, 160 represents a carriage or slide which carries a grinding wheel 155. On the slide 160 is mounted another slide 270 which carries the truing mechanism for dressing the cutting faces of the wheel 155. A slide 270 which carries the truing mechanism for dressing the cutting faces of the wheel 155 is mounted to move on the slide 160 in a direction parallel to the motion of the latter so that the truing mechanism moves with the carriage 160 and is also capable of being moved independently thereof. This is effected by means of a screw 271 formed on the end of a shaft 272, the threads engaging in a lug 273 depending from the slide 270. The shaft 272 may be rotated directly by manipulation of a hand wheel 279 to feed the slide 270 and the truing mechanism carried thereby, or it may be rotated by connection through suitable gearing (not shown herein but fully illustrated and described in my application Serial No. 564,091, hereinbefore referred to) to a shaft 207 by

which feeding motion is given to the carriage 160.

As before stated, the slide 270 carries the truing mechanism and for this purpose it is provided with a segmental-shaped casing portion 290 formed with spaced inner and outer concentric vertical walls 291 and 292, end walls, and a cover plate 293 bridging the top thereof. Centrally disposed through the walls 291 and 292 in the plane of the grinding wheel is a rock shaft 294 and between the walls 291 and 292 preventing axial movement of this shaft, except as they may be relatively adjusted, is a beveled gear 295 fixed thereto. At either side of this gear are fixed angularly disposed stub shafts 296, one only of which is shown in Figure 2, which carry similar bevel gears 297 meshing with the gear 295. These gears 297 in turn mesh with similar bevel gears 298 fixed to shafts 299 which are journaled in the walls 291 and 292 and extend toward opposite beveled side cutting faces of the grinding wheel where this wheel extends rearwardly of the plate 152. The rock shafts 294, 296, as shown in Figure 2, may be arranged radially with respect to a point at or near the edge of the wheel 155, this point being also preferably the center of curvature of the side walls of the housing 290. Each of the shafts 294 and 299 at their inner ends have upwardly extending portions 300 in which are adjustably fixed diamonds or other suitable truing tools 301. These truing devices or tools are offset from the axes of their respective shafts, so that by rocking these shafts it is evident that the tools are moved in arc-shaped paths, each path being in a plane, the two side tools operating in the planes of the angularly disposed side cutting faces of the grinding wheel and the central tool acting perpendicularly to the central plane of the wheel. The side tools therefore serve to true the side faces of the wheel and the center tool serves to true the apex. The tools are designed to act on the wheel at points diametrically opposite to the action of the wheel on the work, and while the rocking motion imparted thereto to cause the tools to traverse the entire width of the cutting faces of the wheel brings them slightly out of this

plane, the deviation therefrom is so slight as to be negligible. The rocking of the tools to effect their truing strokes is effected by means of a cam element 310 adjustably fixed to the cam drum 7 which acts on a cam roll 311 carried by a bent lever 312 (Figure 1) which passes out through a side wall of the base 1 of the grinding machine through an opening 313, where it has formed thereon a sleeve portion 314 journaled on a vertical pivot 315. Extending outwardly from the sleeve 314 is an arm 316 to the end of which is adjustably fixed an abutment screw 317 acting to limit the inward movement of the arm, this arm normally being held toward this limit of motion by a spring 318 engaging a perforated lug 319 thereon at one end and extending into the casing 1 and attached to a fixed point therein at the other end. The upper portion of the sleeve 314 has fixed thereto an upwardly inclined arm 320 having a horizontally perforated boss 321 at its upper end. Through this boss passes a pivot bolt 322 to which is pivoted by a vertical pin 323 a link 324 (Figures 2 and 3). The inner end of this link is pivoted by a horizontal pivot bolt 325 to the upper end of an arm 326, the lower end of which is made fast to the outer end of the shaft 294. It is therefore evident that as the cam drum rotates, the arm 320 is rocked periodically and rocking motion imparted by the connections above described to the shaft 294 and through the bevel gears to the shafts 299, thus imparting truing motion to each of the truing devices.

A modified form of mechanism for imparting rocking motion to the truing device shafts and for adjusting the relative positions of the truing devices is shown in Figures 4 and 5. Referring to these figures the truing tools 301 are adjustably mounted in the ends of the centrally disposed rock shaft 294 journaled in the walls 291 and 292 of the segmental-shaped portion of the slide 270 and in shafts 330 positioned on opposite sides of the central shaft and inclined relative thereto to act on the lateral cutting faces of the wheel in the same manner as described in connection with the first form. Each shaft 330, however, instead of being journaled directly in the wall 292 is journaled in a bushing 331 seated in an opening therein and having a flange 332 at its inner end to prevent it from being removed outwardly through the opening in the wall 292. Through the rear end of each bushing 331 is threaded an adjusting screw 334 which bears at its inner end against the rear end of the corresponding shaft 330. By adjustment of these screws the endwise positions of the shafts 330 may be adjusted. A set screw 335 may be employed to lock each adjusting screw 334 in adjusted position. Within the bushing 331 each shaft 330 is threaded as shown at

336, and screwed thereon is a collar 337. This collar abuts against the rear end of a sleeve 338 which is slidably keyed to the shaft 330 and which is urged against the collar 337 by means of a coil spring 339 surrounding a portion of the sleeve 338 and bearing at one end against the inner face of the wall 291 and at the other end against a shoulder 340 on the sleeve 338. By the pressure exerted on the collar 337 by this spring each shaft 330 is urged into engagement with the end of its adjusting screw 334. Each collar 338 has formed thereon a gear segment 341 which meshes with rack teeth 342 on a segment rack bar or face gear 343 which is mounted for limited sliding movement beneath the cover plate 293. This segmental rack bar meshes with the gear segments 341 on each shaft 330 and also meshes with a similar segment, not shown, fixed to the rock shaft 294. By this construction it is evident that rocking motion of the rock shaft 294 may be transmitted through the gear segment thereon to the segmental rack bar 343 and is imparted from this rack bar through the segmental bars 341 to the rock shafts 330 to impart truing movement to the truing devices 301 carried thereby. Adjustment of the collar 337 permits the position of the gear segment 341 axially of each rock shaft 330 to be adjusted in conformity to the axial adjustment of this rock shaft by means of the adjusting screw 334. The rack bar 343 may be guided so as to be moved in an arcuate path by guide pins threaded in the cover plate 293 and projecting through slots in the rack bar or by guide slots cut in the transverse vertical walls connecting the walls 291 and 292.

I claim:—

1. Wheel truing mechanism comprising three shafts arranged with their axes passing substantially through a common point, truing devices eccentrically mounted on the adjacent ends of said shafts to act on relatively angularly disposed cutting faces of said wheel, and means for simultaneously turning said shafts to effect cutting traverses of said devices across said wheel faces.

2. Wheel-truing mechanism comprising three shafts arranged with their axes passing substantially through a common point, truing devices eccentrically mounted on the ends of said shafts adjacent to said common point, means for rocking one of said shafts, and means for operatively connecting all three shafts together for simultaneous rocking motion, said connecting means including a gear wheel fixed on each shaft and an idle gear wheel meshing with each pair of adjacent shaft-carried gear wheels.

3. Wheel-truing mechanism comprising a housing having an arcuate side wall, a plurality of rock shafts journaled in said side wall and projecting toward the center of

curvature of said side wall, truing devices
mounted on the ends of the shafts adjacent
to said center, means for rocking one of said
shafts, and a gear train carried within said
housing and operatively connecting all said
shafts for simultaneous actuation.

In testimony whereof I have affixed my
signature.

RALPH E. FLANDERS.

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