

Aug. 14, 1934.

J. W. SNARRY

1,970,060

MACHINE FOR GRINDING SPLINED SHAFTS, GEAR TEETH, AND THE LIKE

Filed Feb. 10, 1933

2 Sheets-Sheet 1

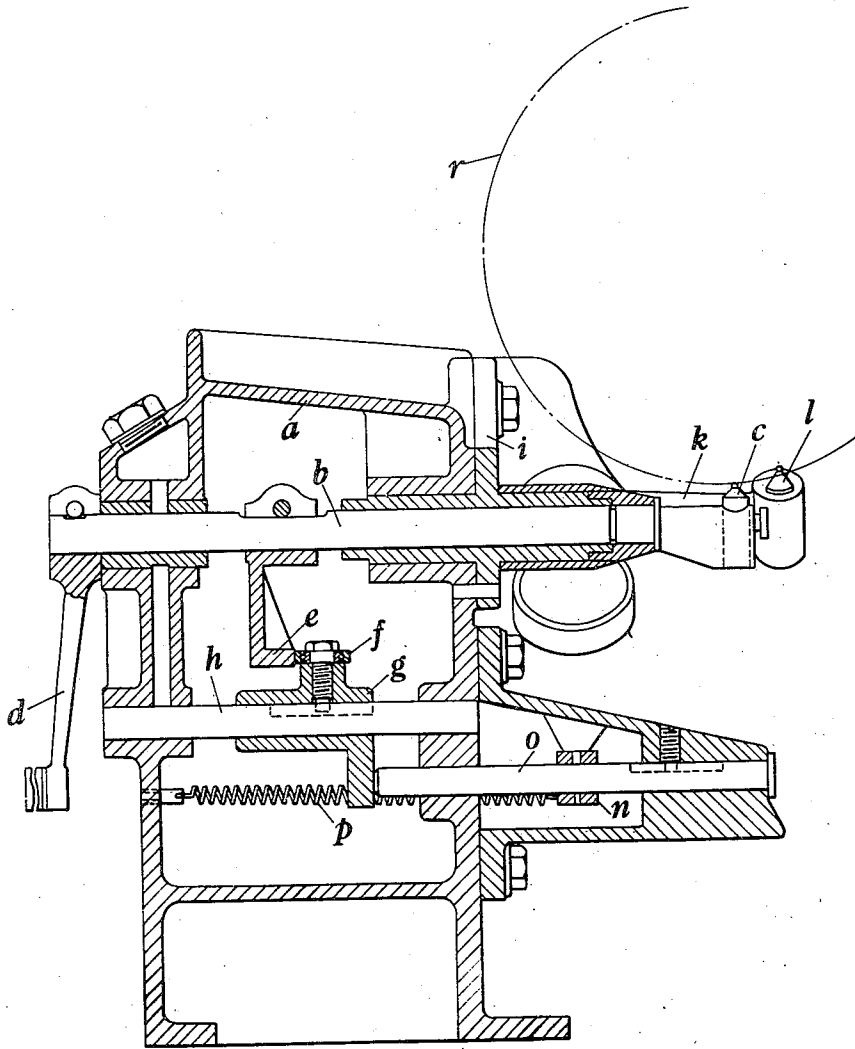


Fig.1

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2 Sheets-Sheet 2

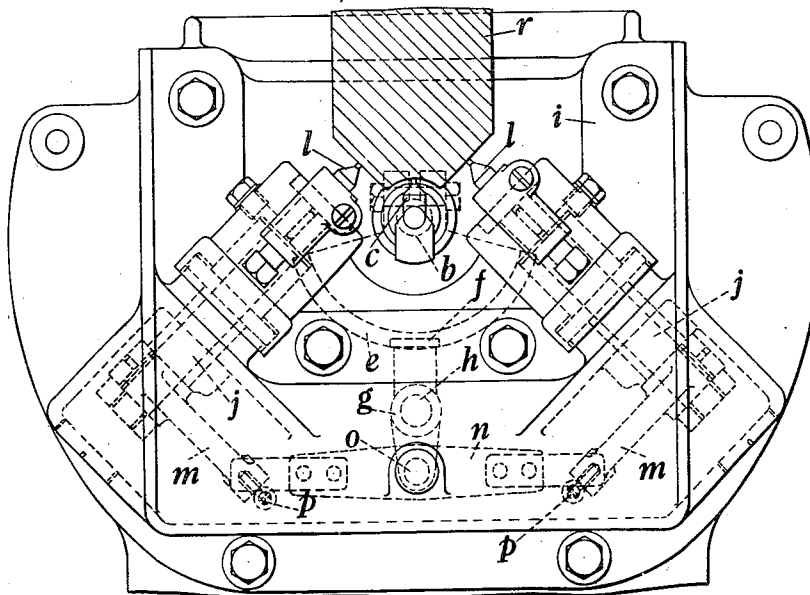


Fig. 2

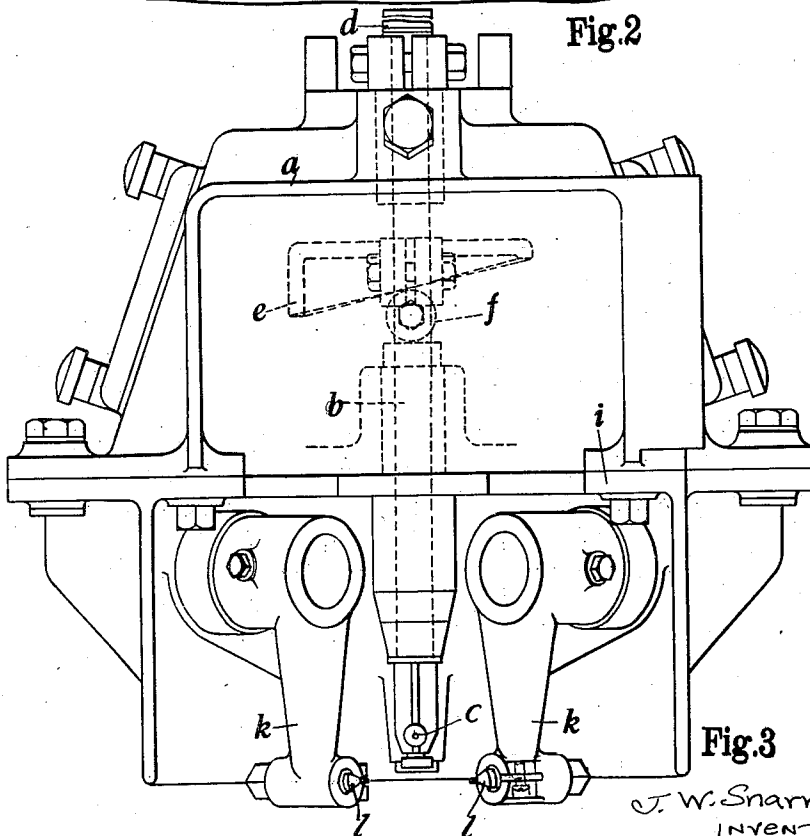


Fig. 3

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UNITED STATES PATENT OFFICE

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MACHINE FOR GRINDING SPLINED SHAFTS, GEAR TEETH, AND THE LIKE

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In Great Britain March 5, 1932

2 Claims. (Cl. 125-11)

This invention relates to grinding machines of the kind in which a formed grinding wheel is used for grinding splined shafts, the teeth of gear wheels and the like, and has for its object to provide simple and convenient hand operated means for trimming or maintaining the contour of the operative surfaces of the grinding wheel.

The invention comprises the combination of a spindle carrying the peripheral trimming tool, a pair of arms carrying face trimming tools and situated on opposite sides of the peripheral tool, a pair of mutually inclined spindles carrying the arms of the side tools, a reciprocatory cross bar adapted to impart rocking motion to levers on the said inclined spindles, and a cam on the spindle of the peripheral trimmer for actuating the cross bar.

Also the invention comprises the combination with a body part carrying the spindle of the peripheral trimmer, of a plurality of removable members each carrying side trimmer spindles disposed in a manner appropriate to the relative inclinations of the grinding wheel faces to be treated.

In the two accompanying sheets of explanatory drawings:—

Figure 1 is a longitudinal section of a trimming mechanism constructed in accordance with this invention.

Figure 2 is an end view of the mechanism and Figure 3 a plan.

In the application of the invention in the manner illustrated to a trimming mechanism suited for use with a machine for grinding the peripheral surfaces of splined shafts, and the radial faces of the splines or keys on the same, I employ a hollow body part *a* on which is mounted a spindle *b* carrying the peripheral trimming tool *c*. At the end of the spindle opposite the tool is provided an actuating handle *d*. Within the body is secured on this spindle a cam *e* which engages a roller *f* on a slidable member *g* also carried within the body *a* on a stationary guide bar *h*.

On one end face of the body part is mounted a removable member *i* carrying (on opposite sides of the spindle *b* above-mentioned) a pair of mutually inclined spindles *j* to the outer end of each of which is secured an arm *k* carrying a side trimming tool *l*. The inner end of each of these spindles has secured to it a lever *m* which abuts against a slidable cross bar *n*, this bar being attached to a rod *o* which abuts at one end under the action of a spring or springs *p* against the slidable member *g* above-mentioned. In the mechanism illustrated in the drawings, a sepa-

rate spring *p* is provided for each lever *m*, one end of each spring being connected to the hollow body part *a* and the other end of each spring being connected to the free end of the associated lever *m*, as shown in Figure 2. In this way the levers *m*, by abutting under the action of their springs against the side of the cross bar *n* remote from the cam *e*, cause the roller *f* on the slidable member *g* to be maintained constantly in contact with the cam *e*.

Oscillation of the actuating handle produces direct oscillation of the peripheral trimmer *c*, and also at the same time causes the side trimmers *l* to oscillate through the medium of the cam *e*, slidable member *g*, cross bar *n* and levers *m*, the said trimmers being thereby caused to traverse the peripheral surface and the inclined side surfaces of the grinding wheel *r* as will be readily seen in Figure 2. It will be understood that the levers *m* are capable of pivotal movement only but that this movement can be caused by the reciprocating cross bar *n* due to the absence of a mechanical connection between the latter and the said levers.

The relative inclinations of the side trimmer spindles vary with the relative inclinations of the adjacent faces of the splines to be ground. In a shaft provided with four equally spaced splines, the adjacent radial faces of the splines will be inclined at 90° to each other, and the angle between the axes of the side trimmer spindles will then be 90°. When the shaft is provided with six equally spaced splines, the angle between the axes of the spindles will be 120°. Other numbers of splines will be associated with other angles. To meet these conditions I find it preferable to provide a number of different removable members *i* each fitted with an appropriate pair of relatively inclined spindles *j*, and each adapted to be readily mounted in position on the body part *a*.

By this invention a simple hand operated trimming mechanism can be constructed in a compact and convenient form.

Whilst the invention is intended primarily for treating grinding wheels having flat and oppositely inclined sides for grinding splined shafts, it may be used for treating the wheels employed for grinding gear teeth and other objects in which it is required to grind the surfaces accurately to predetermined forms.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. For use in grinding machines of the kind specified, the combination of a spindle carrying

the peripheral trimming tool, a pair of arms carrying face trimming tools and situated on opposite sides of the peripheral tool, a pair of mutually inclined spindles carrying the arms of the side tools, levers on the inclined spindles, a reciprocatory cross bar adapted to impart rocking motion to said levers, and a cam on the spindle of the peripheral trimmer for actuating the cross bar.

2. For use in grinding machines having the combination set forth in claim 1, the combination with a body part carrying the spindle of the peripheral trimmer, of a removable member carrying the side trimmer spindles, substantially as described.

JOHN WILDSMITH SNARRY.

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