March 1, 1955 T. A. GROVE 2,703,032

RADIUS TOOL

Filed July 18, 1952

Fig. 1.

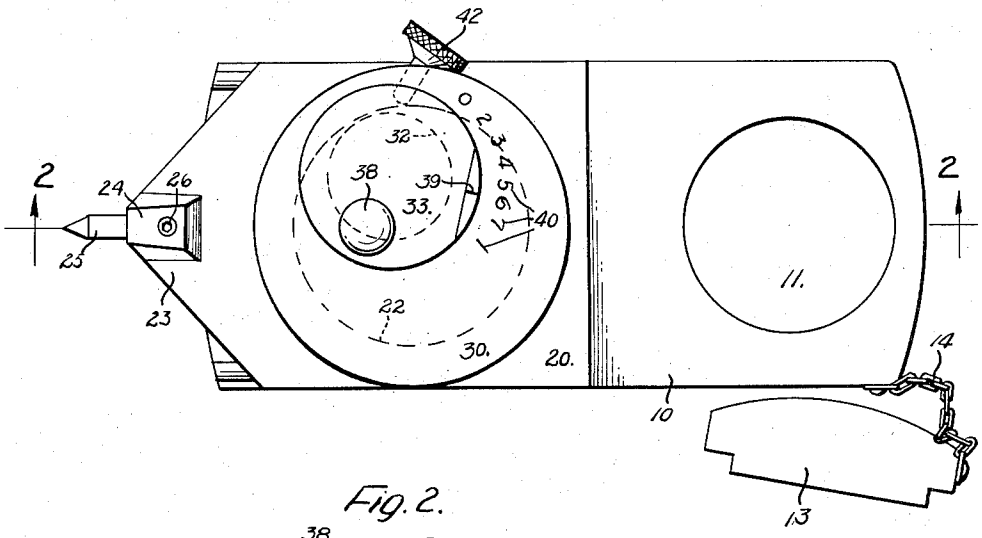


Fig. 2.

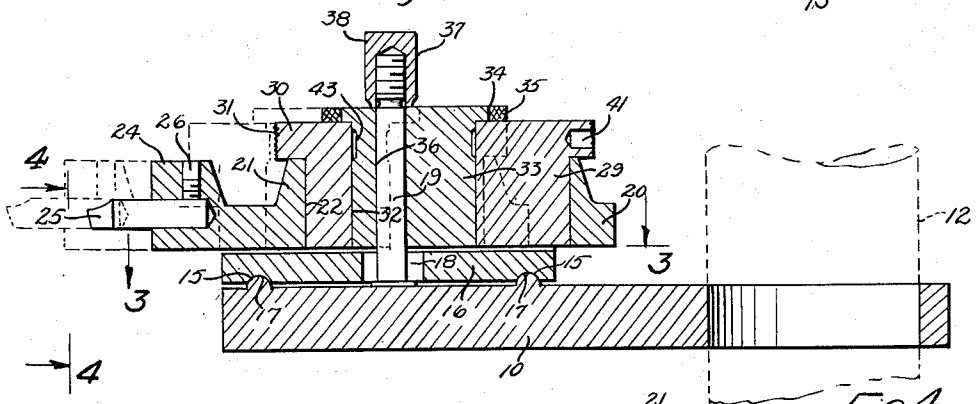


Fig. 3

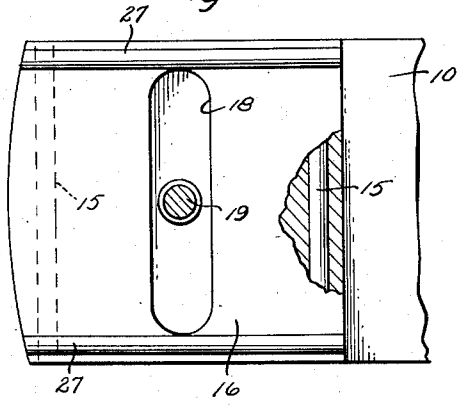
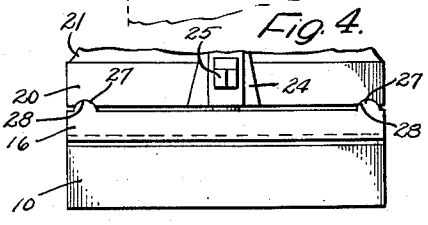


Fig. 4.



INVENTOR

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RADIUS TOOL

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6 Claims. (Cl. 82—11)

The present invention relates to a radius tool and it consists in the combinations, constructions and arrangements of parts herein described and claimed.

Generally there is provided a radius tool the use of which will assist workmen in the making of radii and balls on lathes, shapers, planers and the like. The tool of the present invention attaches to the conventional tool post associated with such machines and may be changed from one radius to another instantly and without removing the tool from the post and without the necessity for resharpening the same. When used with a pointed tool bit it will cut any radius or sphere desired. If a radius tool bit is used with the present invention, then the radius of such bit may be added or detracted from the conventional measurements to make a perfect arc.

It is accordingly an object of the invention to provide a novel radius tool which is capable of being adjusted in situ upon a machine to which it is attached.

Another object of the invention is to provide, in a device of the character set forth, novel means for adjusting the position of a cutter blade forming a part of the invention.

Another object of the invention is to provide a device of the character set forth which is simple in construction, inexpensive to manufacture and yet effective and efficient in use.

Other and further objects of the invention will become apparent from a reading of the following specification taken in conjunction with the drawing, in which:

Figure 1 is a plan view of an embodiment of the invention,

Figure 2 is a sectional view taken along line 2—2 of Figure 1,

Figure 3 is a fragmentary sectional view taken substantially along line 3—3 of Figure 2, and

Figure 4 is a fragmentary sectional view taken substantially along line 4—4 of Figure 2.

Referring more particularly to the drawing, there is shown therein a radius tool comprising an elongated base member **10** which extends horizontally and which is provided with a circular opening **11** adjacent one end thereof which opening **11** is adapted to receive therethrough a tool post indicated in dotted lines at **12** in Figure 2. Such tool posts are conventional and are conventionally provided with a vertically extending lock slot (not shown) through which a locking block **13** is adapted to be inserted after which a set screw is first pressed against the upper end of such block to lock the base **10** in position. A chain **14** interconnects the block **13** with the base **10** to prevent loss of the block **13**.

The base **10** is provided upon its upper side with a pair of transversely extending spaced parallel rails which are formed integrally with the base **10**, as indicated at **15**. A transversely removable plate **16** is provided upon its underside with a pair of spaced transversely extending parallel grooves **17** each of which is adapted to receive therein one of the rails **15**. The plate **16** is also centrally provided with a transversely extending slot **18**.

A vertically extending cylindrical post **19** is centrally affixed to the upper side of the base **10** adjacent the outer end thereof and is adapted to extend through the slot **18**.

A longitudinally slidable plate or carriage **20** is centrally provided with an upstanding collar **21** which is formed integrally therewith and a circular opening **22** extends vertically through the collar **21** and plate **20**. The outer end of the plate **20** tapers, as indicated at **23** and has integrally formed at its outer end an upstanding

tool socket **24** in which is removably mounted a cutting tool **25** which is held in the socket **24** by means of a set screw **26**. The upper side of the plate **16** is formed thereon adjacent each side edge thereof an upstanding longitudinally disposed rail **27** each of which is receivable in a groove **28** formed on the underside of the plate **20**.

A vertically extending cylinder **29** is revolubly mounted in the opening **22** and is provided with an outwardly extending annular flange **30** which overlies the upper end of the collar **21**. The outer face of the flange **30** is beaded, as indicated at **31**.

The cylinder **29** is provided with an eccentrically positioned vertically extending cylindrical opening **32** in which is revoluble a cam **33** which is provided at its upper end with an outstanding flange **34** whose outer face is beaded, as indicated at **35**. The cam **33** is provided with an eccentrically positioned vertically extending cylindrical opening **36** for the reception therethrough of the post **19**. The post **19** is exteriorly threaded, as indicated at **37**, at its upper end for the threaded reception thereon of a nut **38**.

The upper face of the enlarged portion **34** is provided with a radially extending marker **39** adjacent the peripheral edge thereof and a series of indicia **40** is placed upon, by cutting or otherwise, the upper face of the enlarged portion **30**. A series of inwardly extending radial openings **41** formed in the peripheral edge of the enlarged portion **30** of the cylinder **29**. A set screw **42** extends inwardly through the flange **30** and is adapted to bear against a reduced angular portion **43** formed in the upper portion of the cam **33**.

In operation, it will be apparent that the base **10** may be fixed in conventional manner to the tool post **12** and thereafter locked by means of the block **13**. The base **10** will be extend toward the work piece upon which the blade **25** is to act and it will be seen that by setting the marker **39** with the proper indicia **40** which indicia indicate a particular radius in each case, and thereafter locking the cam **33** in position within the cylinder **29** by means of the set screw **42**, that by inserting a lever in any convenient opening **41** that the blade **25** will be caused to move in a circular path when viewed from above. It will also be seen that in one half of the revolution of the blade **25** that the blade will cut into the work piece to cut a radius therein and that in the other one-half of its revolution it will act to cut a substantial hemisphere or "ball." Thus by constantly readjusting the position of the cam **33** as aforesaid and moving the work longitudinally with respect to the cutter blade **25**, a great variety of shapes may be formed in the work pieces to which the blade **25** is applied, it being understood that the work pieces are revolved as they come into contact with the cutter blade, such revolving of the work being conventional in lathes and like machines.

While but one form of the invention has been shown and described herein, it will be readily apparent to those skilled in the art that many minor modifications may be made without departing from the spirit of the invention or the scope of the appended claims.

What is claimed is:

1. A device of the character described comprising a base adapted to be attached to the tool post of a lathe or the like, a lower plate transversely slidable upon said base, and having a transverse slot therein, an upper plate slidable upon said lower plate longitudinally with respect to said base and having a circular opening therein, a cylinder revolubly mounted in said circular opening and having an eccentrically disposed cylindrical opening therethrough, a cam revolubly mounted in said cylindrical opening and having an eccentric opening therethrough, a shaft affixed to said base and extending through said slot and said eccentric opening, a socket affixed to one side of said upper plate, a cutting tool removably mounted in said socket, means for locking said cam in selected positions in said cylinder, and means for turning said cylinder.

2. A device as defined in claim 1 wherein said locking means comprises a set screw extending through the flange of said cylinder and adapted to bear against the side of said cam.

3. A device as defined in claim 1 wherein said turning

means comprises a plurality of radial openings in said cylinder for the reception therein of a lever.

4. A base for use on a machine tool, a post mounted on and extended upwardly from said base, a plate having a transversely disposed slot therein mounted to slide transversely on said base, a carriage having a vertically disposed cylindrical opening therethrough mounted to slide longitudinally on said plate, a cylinder having a vertically disposed eccentrically positioned opening therein journaled in the cylindrical opening of the carriage, a centrally located upstanding collar on said carriage, an outwardly extending annular flange on said cylinder overlying the upper edge of said collar, said post extended upwardly through the transversely disposed slot of the plate and cylindrical openings of the carriage and cylinder, and a cylindrical cam journaled on said post and positioned to rotate in the vertically disposed cylindrical opening of the cylinder whereby upon rotation of the cam the carriage travels longitudinally of the plate and the plate travels transversely of the base, said carriage having a tool holding socket on an extended end.

5. In a radius tool, the combination which comprises a base for use on a machine tool, a post mounted on and extended upwardly from said base, a plate having a transversely disposed slot therein mounted to slide transversely on said base and positioned with the slot straddling the post, a carriage having a vertically disposed cylindrical opening therethrough mounted to slide longitudinally on said plate, a cylinder having a vertically disposed eccentrically positioned opening therein journaled in the cylindrical opening of the carriage, a centrally located upstanding collar on said carriage, an outwardly extending annular flange on said cylinder overlying the upper edge of said collar, and a vertically disposed cylindrical cam journaled on said post and positioned to rotate in the vertically disposed cylindrical opening of the cylinder, said carriage having a tool holding socket on an extended end, said cylinder having spaced radially disposed graduations on the upper end and said cam having a point positioned to register with the graduations of the cylinder.

6. In a radius tool, the combination which comprises a base having an opening therethrough for mounting the base on a tool post of a machine tool, said base having spaced transversely disposed rails on the upper surface, a plate having an elongated slot in the intermediate portion and spaced grooves positioned to receive the rails of the base slidably mounted on the base, said plate having longitudinally disposed rails on the upper surface, a carriage having a vertically disposed cylindrical opening therethrough and spaced longitudinally disposed grooves in the under surface mounted on the plate and positioned whereby the rails of the plate extend into grooves in the under surface thereof, a cylinder having a vertically disposed eccentrically positioned opening therein journaled in the cylindrical opening of the carriage and having an annular flange on the upper end extended over a portion of the carriage, a post mounted on the base and extended upwardly through the slot of the plate and through the cylindrical opening of the cylinder, a cylindrical cam journaled on said post and positioned to rotate in the vertically disposed opening of the cylinder, an outwardly extending annular flange on said cam overlying the upper edge of said cylinder, a radially extending marker on the flange on the cam adjacent the peripheral edge thereof, indicia on the upper face of the cylinder for cooperation with said marker, said carriage having a tool holding socket on an extended end, and means for locking the parts of the device in adjusted positions.

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