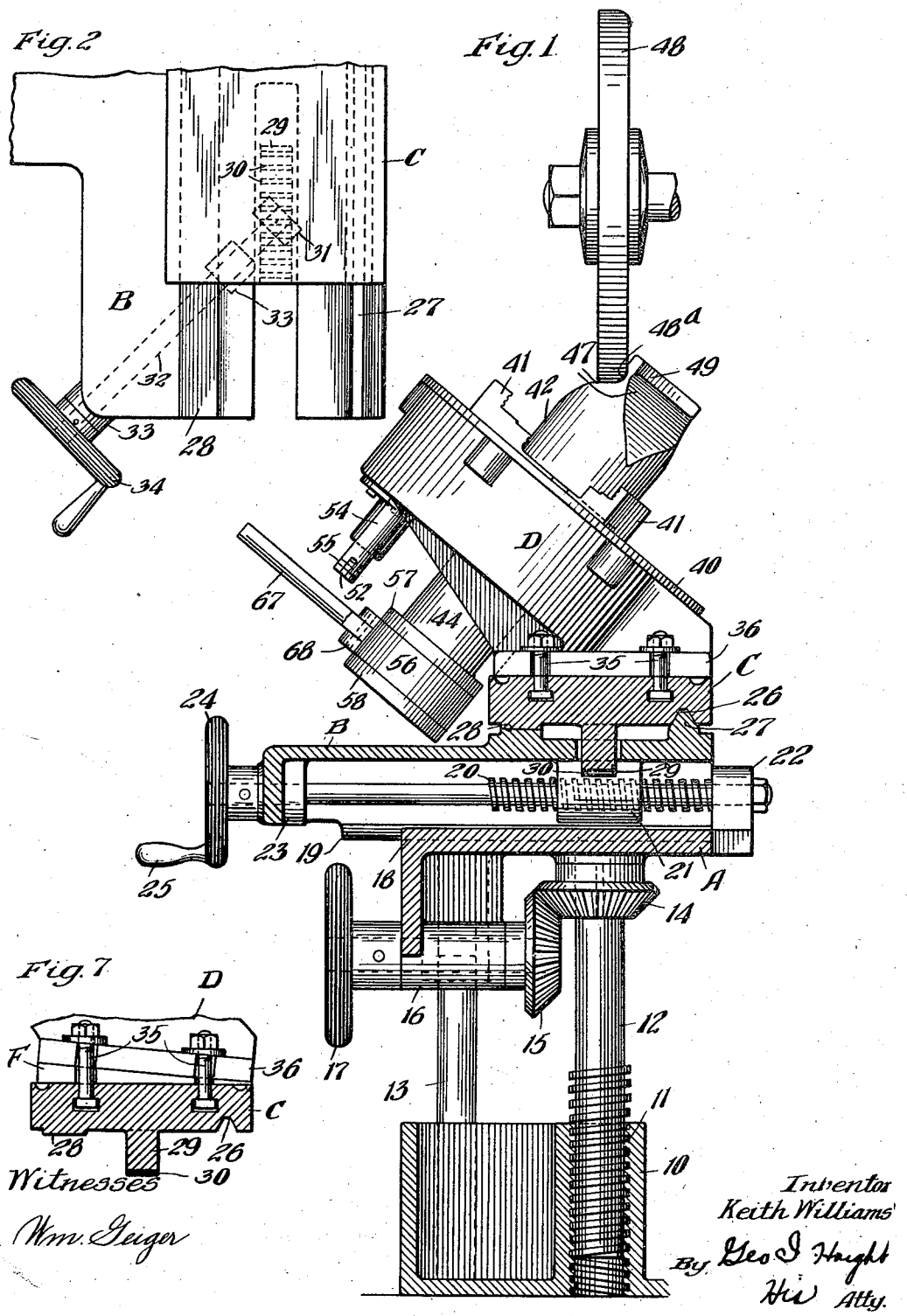
Feb. 8, 1927. 1,616,727

K. WILLIAMS

JIG FOR GRINDING

Filed July 11, 1921 2 Sheets-Sheet 1



Witnesses

Wm. Geiger

Inventor

Keith Williams

By Geo I Haight

His Atty.

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Fig. 3

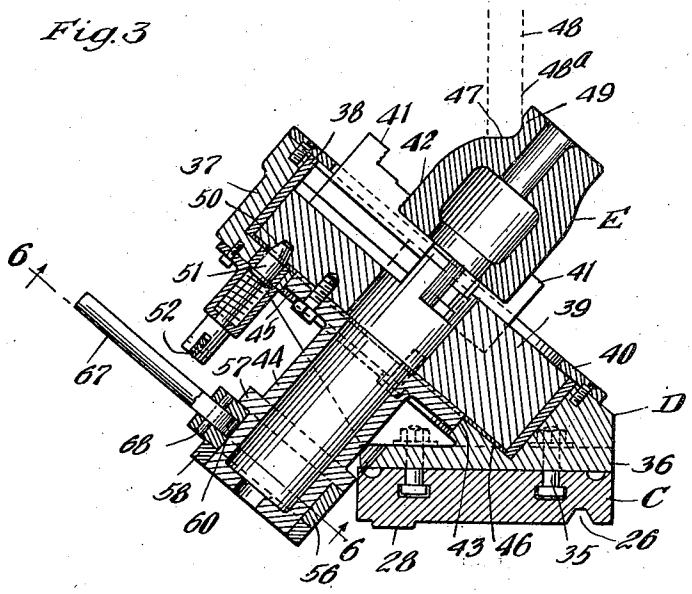


Fig. 4

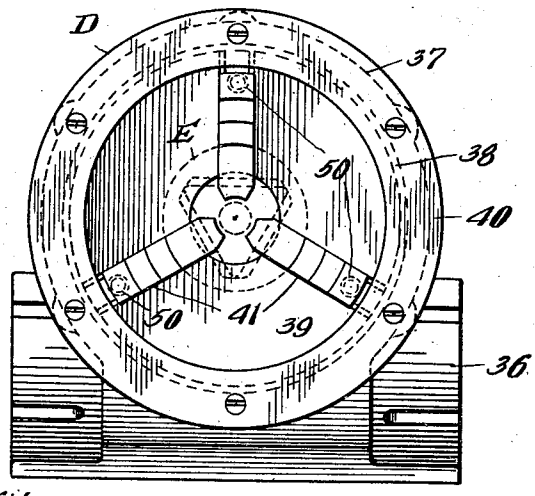


Fig. 5

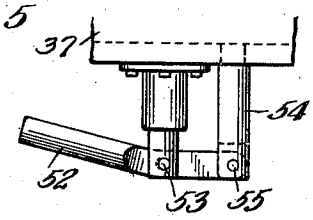
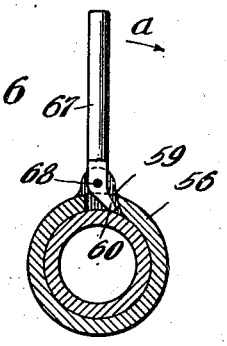


Fig. 6



Witnesses

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UNITED STATES PATENT OFFICE.

KEITH WILLIAMS, OF CHICAGO, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO W. H. MINER, INC., A CORPORATION OF DELAWARE.

JIG FOR GRINDING.

Application filed July 11, 1921. Serial No. 483,672.

This invention relates to improvements in jig for grinding.

In certain types of friction draft gears for railway cars, commonly known in the art as "Miner gears" a wedge of special form is employed to create the necessary expansion or pressure against the friction shoes in developing the shock absorbing capacity. An example of such a wedge may be seen in O'Connor Patents Nos. 1,220,264 granted March 27, 1917, and 1,070,058 granted August 12, 1913. Such wedges employ three wedge faces spaced 120° apart and converging toward the inner end of the wedge. Each wedge face provides a seat for what is known as an anti-friction roller and at the inner end of each wedge face or roller seat there is an outwardly extended shoulder to limit the movement of the roller. On account of this formation, it has been found exceedingly difficult to finish the wedge surfaces at the proper angle with respect to each other, and with respect to the axis of the wedge, both of which factors are of the utmost importance in the operation of the type of gear referred to.

The primary object of my invention is to provide a jig by which such wedges are adapted to be clamped or chucked and properly presented to a grinding wheel to the end that the wedges may be finished accurately, quickly and without any special skill or judgment on the part of the operator. As will be understood by those skilled in the art, the invention is usable for other purposes without departing from the spirit of the invention.

In the drawings forming a part of this specification, Fig. 1 is a part vertical sectional view, part side elevational view of a jig embodying my invention, and showing the manner in which the wedge is presented to the grinding wheel. Fig. 2 is a broken top plan view of the carriage and chuck holder showing the manner of adjusting the latter with respect to the carriage. Fig. 3 is a vertical sectional view taken centrally through the chuck in a plane parallel to the axis of the grinding wheel, as shown in Fig. 1. Fig. 4 is an elevational view looking squarely at the chuck proper. Fig. 5 is a detail view illustrating the locking pin employed with the chuck. Fig. 6 is a detail sectional view corresponding substantially to the section line 6—6 of Fig. 3. And Fig. 7 is a broken detail view similar to Fig. 1 showing certain parts of the jig and the manner of adapting the jig for wedges having wedge faces of different inclination from those shown in the other figures.

Referring first to the structure illustrated in Figs. 1 to 6 inclusive, 10 denotes a suitable heavy base or bed adapted to sustain the other parts of the jig. Said base or bed plate is provided with a vertically extended threaded opening 11 in which is vertically adjustable a heavy screw 12. The latter at its upper end, is swivelled to a support A extending generally in a horizontal direction. The support A is elevated and lowered by means of the screw 12 and in order to prevent the support A from turning with respect to the base 10, the latter may be provided with upstanding guides 13 engaging suitable depending portions of the support A. To effect the rotation of the screw 12, the latter has secured thereto at its upper end a bevel gear 14 with which meshes a bevel gear 15 secured to the inner end of a horizontally disposed shaft mounted in a suitable bearing 16 carried by the support A. Said shaft is manipulated by any suitable means such as a hand wheel 17 at its left hand end as viewed in Fig. 1.

The support A is provided on the upper face thereof with suitable guide grooves 18 with which cooperate correspondingly shaped guides 19 formed on the underside of a horizontally slidable carriage B. The carriage B is adjusted back and forth on the support A from left to right and vice versa as viewed in Fig. 1, by means of an adjusting screw 20 working in a nut 21 rigid with the carriage B, the right hand end of said screw being swivelled in an upstanding lug 22 of the support A. The left hand end of the screw is suitably journaled in a bearing 23 formed in the carriage B, said screw being manipulated by a hand wheel 24 having a hand grip 25.

Mounted on top of the carriage B is what may be termed a chuck-holder or plate C. The latter is formed on its underside with a longitudinally extending guide groove 26 cooperating with an upstanding triangular guide rib 27 formed on the carriage B. Other suitable bearing surfaces 28—28 are formed on the holder C and carriage B. Centrally thereof, the holder C

is provided with a depending rack 29 having shallow pitch helical rack teeth 30 thereon with which cooperates a correspondingly formed helical gear 31 carried by the inner end of a shaft 32. The shaft 32 extends diagonally with respect to the rack 29 and is mounted in suitable bearings 33—33 carried by the carriage B. The outer end of the shaft 32 carries a hand wheel 34 similar to the hand wheel 24 for effecting the necessary adjustments.

With the arrangement so far described, it is evident that the chuck holder or plate C can be adjusted vertically and also horizontally in either or both of two directions at right angles to each other. Stated in another manner, the holder or plate C may be said to have universal adjustment and in this connection it will be noted that all three hand wheels 17, 24 and 34 are located relatively close together so as to render the operation as convenient as possible for the operator.

Detachably but rigidly mounted on the top of the holder C by means of T bolts 35 and the usual T slots is what may be termed the chuck proper D. The latter, as shown, has a lower horizontally extending flange 36 and an integral heavy annular section 37 extending at an angle of 50° with respect to the vertical. Said annular section 27 has a cylindrical opening therein provided with a preferably bronze liner 38. Rotatably mounted within said bronze liner 38 is a heavy plate 39 which is retained in place by a suitable annular plate 40. The heavy plate 39 carries three equally spaced clamping jaws 41—41 of well known form and adapted to be adjusted radially inwardly and outwardly by any one of the well known means. Said jaws are adapted to securely clamp the wedge E which, at its larger end, is of cylindrical formation as indicated at 42. The annular section 37 of the chuck proper is recessed as indicated at 43 and extending therethrough is a hollow sleeve 44 having a flange 45 at its upper end secured to the plate 39 so that both are rotated in unison. Preferably a fiber disc 46 is interposed between the plate 39 and the bottom of the recess in which it is mounted.

The wedges E have three wedge faces or roller seats 47—47, the same being arranged at 120° to each other and, in the particular form shown in the drawings, said faces extend at an angle of 50° with respect to the axis of the wedge E, or, stated in another manner, at 50° with respect to the vertical. With the arrangement so far described, the uppermost wedge face 47 will extend horizontally which will adapt it for proper grinding by the periphery of the emery wheel 48, the latter also preferably having a rounded edge 48ª adapting it to fit in closely and properly against the roller stop 49 of the wedge. In order that the three faces may be ground exactly 120° apart, that is, to insure that the wedge E be advanced or rotated 120° each time a new face is presented, the inner or lower face of the plate 39 is provided with three openings 50—50 spaced exactly 120° apart and with which is adapted to cooperate a spring pressed pin or plunger 51. The latter is adapted to be withdrawn temporarily by a lever 52 pivoted to said plunger as indicated at 53 and also to a post 54 as indicated at 55 in Fig. 5. To rotate the plate 39 and the wedge carried thereby, I provide an annular band 56 swivelled between an integral flange 57 and an applied ring 58 on the hollow sleeve 44. Said band 56 has an opening 59 therein at one side through which extends the bent end 60 of a lever 67 pivoted as indicated at 68 to suitable ears formed on the band 56. By pulling the lever 67 in the direction indicated by the arrow *a* in Fig. 6, it is evident that the sleeve 44 will be clamped and can readily be rotated by swinging the lever 67. By moving the lever 67 in the opposite direction, no turning of the sleeve 44 will take place. The operator, in rotating the wedge to present the wedge faces thereof successively to the grinding wheel, first pulls the lever 52 and then swings the lever 67 in the direction indicated by the arrow *a* and allows the pin or plunger 51 to engage the next opening 50 as will be understood.

When a wedge E is in position as shown best in Figs. 1 and 3 with a face 47 against the grinder wheel, the wedge is worked transverse to the wheel or parallel to the axis by the manipulating of the hand wheel 24 and in a direction parallel to the plane of the wheel or at right angles to the axis of the grinding wheel by the manipulating of the hand wheel 34. The proper height is, of course, obtained by manipulating the wheel 17. The different faces are presented successively as hereinbefore described. From the preceding, it will be seen that the wedges may be ground or finished rapidly and the accurate and uniform grinding of the wedge faces is insured by the particular form of the jig without any skill on the part of the operator.

The wedge E shown in the drawings is one having the faces 47 thereof extending at 50° to the axis of the wedge as hereinbefore explained. It happens, however, that wedges of the type indicated have their faces 47 extended at different angles for different classes of friction gears and in order to adapt my jig for the grinding of wedges of different angled faces, I employ wedge shaped shims F as indicated in Fig. 7 interposed between the chuck D and the chuck holder C. As will be evident to those skilled in the art, the angle of the wedge-shaped

shims F may be varied, that shown in the drawing being 50° so that, when the jig is arranged as shown in Fig. 7, it would be adapted for the grinding of wedges having 45° faces.

I have herein shown and described the preferred manner of carrying out the invention and one specific use thereof. It will be understood, however, that various changes and modifications may be made in the details of construction and the arrangement of parts and in the use, without departing from the spirit of the invention.

I claim:

1. In a device of the character described, the combination with a grinder; of a horizontally disposed carriage adjustable in a vertical plane and in a horizontal plane substantially at right angles to the vertical plane; of a chuck including a hollow annular section having a horizontally disposed portion supported on said carriage, said annular section having its axis disposed at an angle to said carriage, and having its top edges extending substantially parallel with the bottom portion thereof; and a plate rotatably mounted in said hollow section, said plate being provided with means for gripping the work, said means being arranged to hold the work in coaxial relation relative to said hollow section.

2. In a device of the character described, the combination with a horizontally disposed support; of a chuck having a portion mounted on said support and including a hollow annular section the axis of which is disposed at an angle to said support; a plate rotatably mounted in said hollow section, said plate being provided with work holding means adapted to hold the work co-axially with said annular section; and a spring actuated plunger carried by said annular section adapted to be selectively engaged with apertures arranged in a predetermined fashion in said plate.

3. In a device of the character described, the combination with a support; of a chuck mounted on said support, said chuck comprising a hollow annular section and a plate rotatably mounted in said section; means for retaining said plate in said hollow section; an operating portion connected to said plate and extending through said annular section; a collar rotatably mounted on said extension; and a lever pivotally connected with said collar, said lever being provided with an inclined portion adapted to bind the collar on said extension when moved in one direction and permitting free movement of said collar when said lever is moved in a reverse direction.

In witness that I claim the foregoing I have hereunto subscribed my name this 5th day of July, 1921.

KEITH WILLIAMS.