July 28, 1925.

1,547,595

A. M. LOFLAND

JIG

Filed Jan. 20, 1921

2 Sheets-Sheet 1

Fig. 1

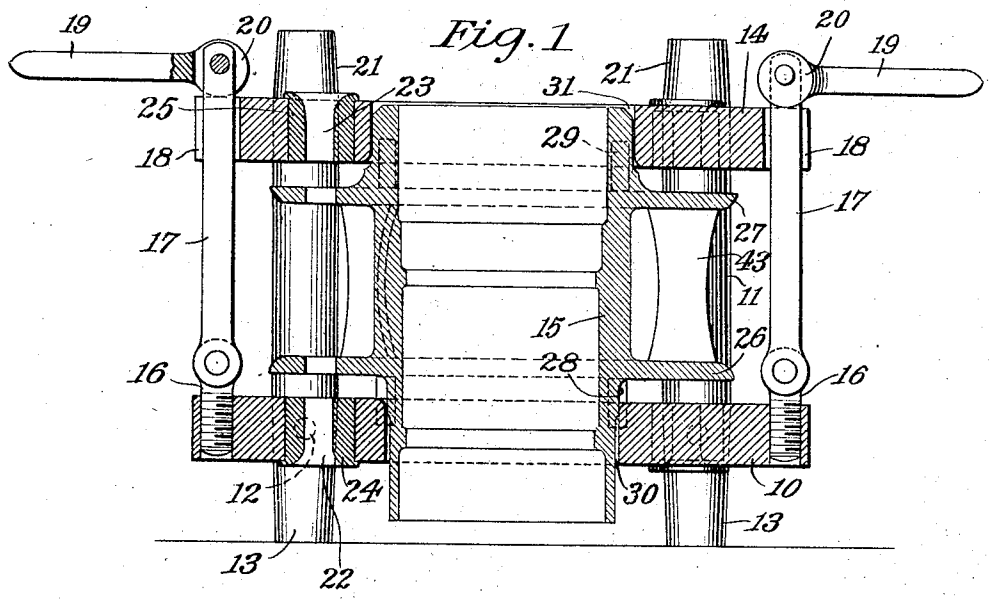
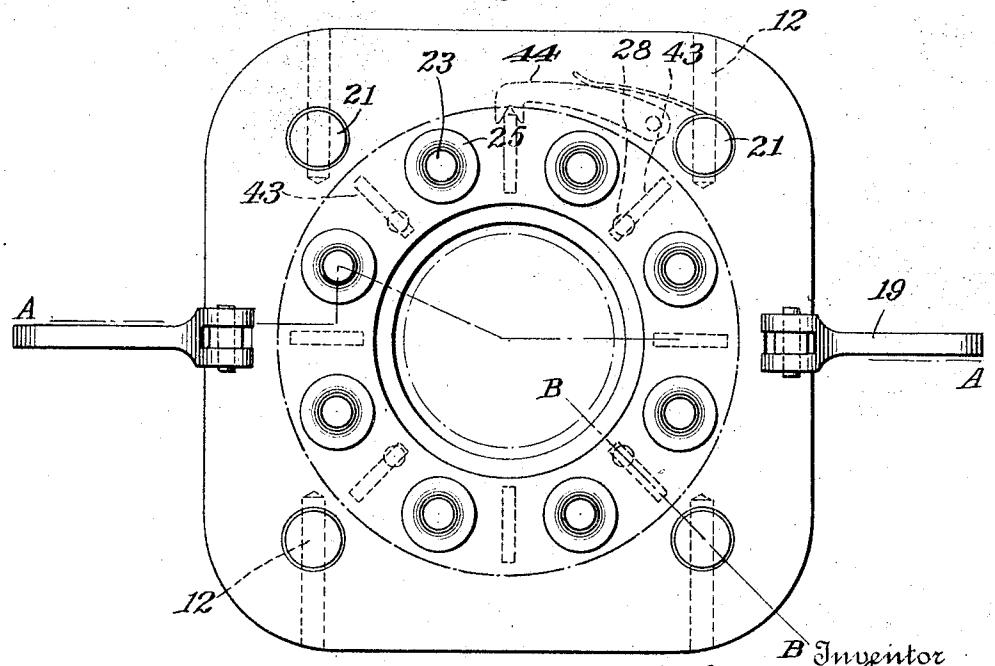


Fig. 2



Inventor
Alfred M. Lofland
By his Attorney
Wm Bohleber

July 28, 1925.

1,547,595

A. M. LOFLAND

JIG

Filed Jan. 20, 1921

2 Sheets-Sheet 2

Fig. 3

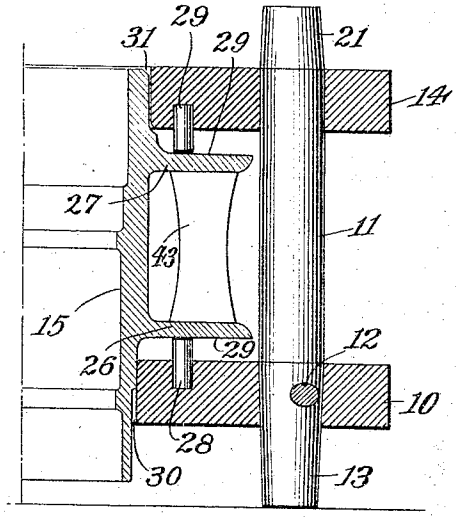
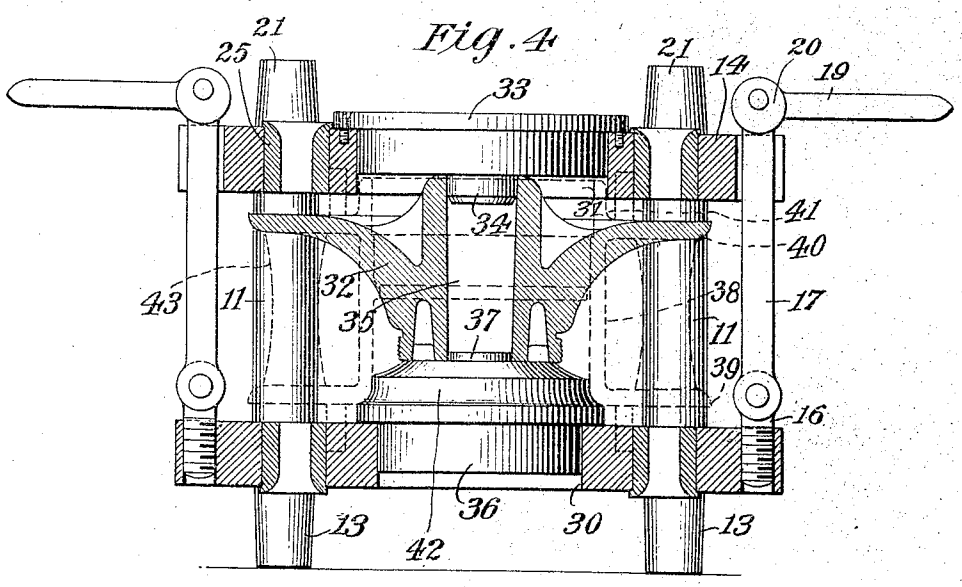


Fig. 4



Inventor
Alfred M. Lofland
By his Attorney
Wm Bohleber

Patented July 28, 1925. 1,547,595

UNITED STATES PATENT OFFICE.

ALFRED M. LOFLAND, OF LEBANON, INDIANA, ASSIGNOR OF ONE-HALF TO LEWIS C. WILLIS, OF INDIANAPOLIS, INDIANA.

JIG.

Application filed January 20, 1921. Serial No. 438,693.

To all whom it may concern:

Be it known that I, ALFRED M. LOFLAND, a citizen of the United States, residing at Lebanon, in the county of Boone and State of Indiana, have invented certain new and useful Improvements in Jigs, of which the following is a full, clear, and exact description.

The invention which constitutes the subject matter of this application relates to a jig, and while it is particularly adapted to enable holes to be drilled in the flanges of metal wheel hubs and metal driving flanges for hubs, nevertheless it may be employed for other purposes.

One of the important objects of my invention is to provide a single jig which is adapted to drill holes not only in the flange of the front and rear hubs, but also to drill corresponding holes in the driving flange ordinarily used on the rear hub and axle. In other words, the single jig which I have devised is capable of being employed in the manufacture of one or more sets of metal hubs and metal driving flanges, thus doing away with the necessity of having a complete jig for every particular set of hubs and flanges, much less for every piece of work. This assures that the holes drilled in the flanges of the hubs and in the driving flange for each set or a number of sets will be uniform and properly aligned with each other, thus greatly facilitating the manufacture and assembly of the parts. Furthermore, it is important that the holes in the flanges of any particular hub should be in exact alignment with each other and my invention also contemplates improvements for accomplishing this result.

Other objects and advantages of the invention will appear from the detailed description below, taken in connection with the accompanying drawings in which:

Figure 1 is a cross-sectional view of the invention taken on the line A—A of Figure 2, showing its use with one type of steel wheel hub for the front axle;

Figure 2 is a top plan view of the jig;

Figure 3 is a detail view taken on the line B—B of Figure 2;

Figure 4 is a cross sectional view showing the application of the invention to a rear hub of another type of wheel and its driving flange, the former being illustrated in dotted and the latter in full lines.

Referring to the drawings in detail and with particular reference to Figures 1 to 3, the numeral 10 designates the base of the jig provided with a plurality of uprights or aligning posts 11, the lower ends of which are tapered and extend through tapered perforations in the base plate and secured thereto, in the form shown, by dowels 12. It will be noted that the uprights or posts 11 project a substantial distance below the base 10 to provide supports 13. Cooperating with the base plate 10 is a removable upper plate 14 provided with a plurality of perforations, the number and position of which, in the form shown, correspond exactly to the number and position of the tapered perforations in the base plate. These perforations in the upper plate 14 enables it to be readily assembled in operative relation to the base plate 10 with the uprights 11 extending therethrough, as clearly shown in Figures 1 and 3.

In Figures 1 to 3 is illustrated one form of metal hub 15, located between the base and upper members 10 and 14. For clamping said hub between said members the following mechanism is preferably employed. One of the plates, preferably the base plate 10, is provided with adjustable posts 16 to which one of the ends of links 17 is pivoted and adapted to be swung into and out of the slots 18 in the upper plate 14. The other end of the links above said plates are provided with levers 19 having the ends 20 eccentrically pivoted to said links in such a way that when moved to the position indicated in Figure 1, the eccentric ends 20 engage the upper surface of the plate 14, thereby clamping the work between said base and said upper members 10 and 14. Obviously when the levers 19 are moved in the opposite direction, the links 17 may be withdrawn from the slots 18, the upper plate 14 removed and the work taken out. As will be noted from Figures 1 and 3, the construction is preferably such that the uprights 11 project upwardly a substantial distance above the upper plate 14 to provide supports 21 corresponding to supports 13 below the base member 10.

The base and upper plates are respectively provided with perforations 22 and 23, preferably corresponding to each other in number and location to receive bushings 24 and 25 serving as guides for a suitable drill-

ing tool employed to drill holes through the flanges 26 and 27 of the hub 15.

To enable the escape of the boring chips or shavings, the respective flanges or the work to be operated upon must be spaced slightly from the plates 10 and 14. In the form shown, fixed pins 28 and 29 are provided for this purpose (see Fig. 3) in the respective plates 10 and 14. These pins also take the longitudinal thrust of the plates 10 and 14 when the work is clamped therebetween.

The pins are forced or screw-threaded into correspondingly shaped holes formed in the plates, but any other method may be employed to anchor or secure said pins to said plates. The proper alignment of the work is taken care of by virtue of the fact that the central openings 30 and 31 in the plates coincide with the external diameter or configuration if the work which passes through said openings.

In Figure 4 is illustrated the adaption of the invention to a modified form of hub and its driving flange 32. The former is illustrated in dotted lines and the latter in full lines. The adaption of the device to the driving flange will first be considered. In this case an abutment member 33 for the driving flange 32 partially enters and is rigidly secured in the central opening 31 of the upper plate and is provided with a downwardly projecting centering stud 34 adapted to enter the axle opening 35 of said driving flange 32. The central opening 30 of the base plate is also provided with an abutment member 36 having an upwardly projecting centering stud 37 also adapted to enter the opening 35 of the driving flange. Studs 34 and 37 fit the opening 35 snugly, thereby enabling the proper positioning and alignment of the driving flange in the jig.

The hub 38, illustrated in Figure 4 in dotted lines, is provided with laterally projecting flanges 39 and 40. One end 41 of the hub is centered by its partial entrance into the central opening in the top plate 14, but as the other end of the hub terminates at the laterally projecting flange 39, and as it is also larger than the central opening in the base plate 10, I provide the abutment member 36 with a peripheral groove or depression 42, thereby enabling it to telescope slightly but sufficiently into the hub to center the latter. The partial entrance of the abutment 33 into the opening 31 enables the jig to be employed with the abutment attached without interfering with the use of the jig for the hub 38.

The reference numeral 43 in all the figures designates bracings for the flanges of the hubs cast therewith. To assure that the work is properly positioned in the jig I employ a spring pressed member 44 adapted to engage one of the bracing members 43.

From the foregoing it will be seen that my improved form of jig lends itself to the front hub, to the rear hub and to the driving flange of said rear hub. When the jig is employed for the front hub of the type illustrated, the abutments 33 and 36 are omitted. When it is employed for the form of rear hub shown, the abutment 36 only is used in conjunction therewith, and when it is employed for the hub flange shown, both the abutments 33 and 36 are used.

As previously stated, the construction of the jig illustrated in Figure 1 is specifically designed for use in the manufacture of the front hub employed on one type of car, and the form illustrated in Figure 4 illustrates the use of this jig for a hub flange and hub used on another car, the only difference being that the central openings in the plates differ in size. It will be readily apparent, however, that one jig may be designed that will take care of any particular set of hubs and hub flange and that by proper construction and designing for the maximum and minimum sizes of hubs and flanges in actual use, two or three jigs can be employed to take care of practically any size of hub desired by the selection of proper types of abutments 33 and 36 and suitable bushings (not shown) to increase or diminish the sizes of the openings 30 and 31.

In operation, assuming the assembly of the work has been effected, the drilling tools are caused to enter the bushings in one plate to drill the holes in one flange after which the jig is reversed and the drilling of the holes in the other flange is effected in like fashion. This assures that the drilling tools enters one flange in exact alignment with the holes already drilled in the other flange which might not otherwise be the case where the two flanges are drilled from one direction only due to the fact that the flange remote from the drilling tool is some three inches from the latter and which would be required to first penetrate a hard scale surface, thus tending invariably to throw said tool out of line.

It will thus be readily apparent that as the drill openings in the bushings 24 in the base plate and the bushings 25 in the upper plate are in exact alignment with each other, the holes drilled in the flanges of the hubs and in the rear hub driving flange will not only be of the same dimensions, but will also be in alignment. Likewise the holes for receiving the aligning posts 11 are also in exact alignment; in fact the construction of the device is such that the assembly of the base and upper members 10 and 14 upon the posts 11 results in the alignment of the bushings 24 with the bushing 25.

I have illustrated and described herein specific constructions of a jig capable of interchangeable use for different pieces of

work. It is to be understood, however, that I do not limit myself to the exact constructions illustrated and described as many changes may be made in points of detail and other embodiments resorted to in the manufacture of the same and different types of work, without departing from the true spirit and scope of my invention as defined by the annexed claims.

What I claim is:

1. A jig comprising a lower and an upper member removably secured to each other for holding the work, said members provided with a plurality of aligned tool receiving bushings, means for maintaining said bushings in alignment and projecting through each of said members for supporting the jig from either end whereby the jig may be reversed so that the projections through one member form the base when drilling therethrough and the projections through the other member form the base when drilling through it.

2. A jig comprising a lower member and an upper member removably secured to said lower member, said members being provided with central perforations therein to receive and align the work, a plurality of tool receiving bushings in each member, the bushings in one member being in alignment with those in the other member, means for maintaining said bushings in alignment and projecting through each of said members for supporting the jig from either end whereby the jig may be reversed so that the projections through one member form the base when drilling therethrough and the projections through the other member form the base when drilling through it.

3. A jig comprising a lower member and an upper member removably secured to said lower member, said members being provided with central perforations therein to receive and align the work, a plurality of tool receiving bushings in each member, the bushings in one member being in alignment with those in the other member, means permanently secured to one of said members for maintaining said bushings in alignment and projecting through each of said members for supporting the jig from either end whereby the jig may be reversed so that the projections through one member form the base when drilling therethrough and the projections through the other member form the base when drilling through it.

4. A jig comprising a lower and an upper member removably secured to each other for holding the work, tool receiving bushings in said members, means for maintaining said bushings in a definite position one relative to the other and projecting through each of said members for supporting the jig from either end whereby the jig may be reversed so that the projections through one member form the base when drilling therethrough and the projections through the other member form the base when drilling through it.

5. A jig comprising a lower member and an upper member removably secured to each other for holding the work and each provided with a plurality of aligning post perforations therein, a plurality of tool receiving bushings in said members, the bushings in one member adapted to be aligned with the bushings in the other member, means for maintaining said bushings in alignment comprising a plurality of aligning posts the lower ends of which are secured in the perforations in the lower member and over the upper ends of which the perforations in the upper member are adapted to telescope, and means carried by the lower member and cooperating with the upper member for drawing said members towards each other for clamping the work between them.

6. A jig comprising a lower member and an upper member removably secured to each other for holding the work and each provided with a plurality of aligning post perforations therein, means for maintaining said members in proper alignment comprising a plurality of aligning posts passing through said perforations and mechanism adjustably attached to one of said members and provided with means cooperating with the other member for drawing said members towards each other for clamping the work between them.

In testimony whereof, I have hereunto set my hand this 15th day of January, 1921.

ALFRED M. LOFLAND.