E. G. BUDD.

METHOD OF MAKING WHEEL DISKS.

APPLICATION FILED MAY 24, 1919.

1,421,667. Patented July 4, 1922.

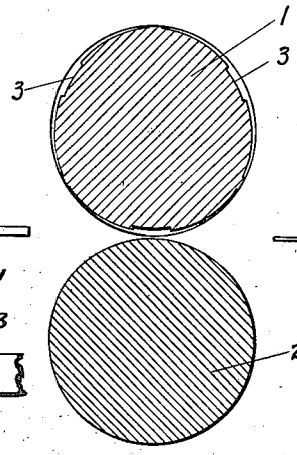


Fig. I

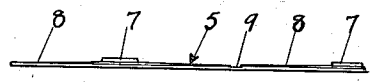


Fig. VI.

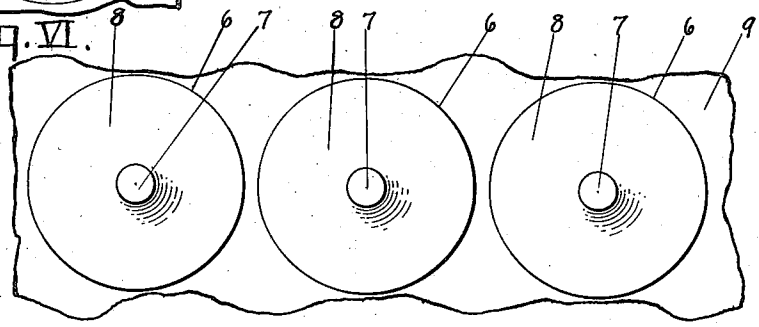


Fig. II

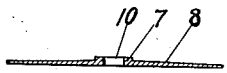


Fig. IV.

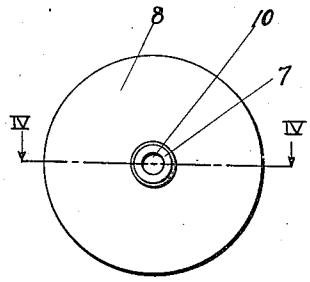


Fig. III.

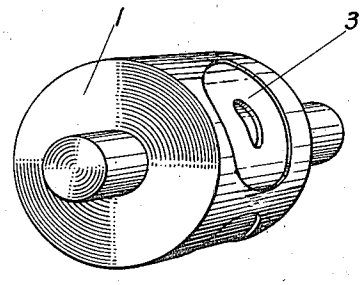


Fig. V.

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EDWARD G. BUDD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BUDD WHEEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METHOD OF MAKING WHEEL DISKS.

1,421,667. Specification of Letters Patent. Patented July 4, 1922.

Application filed May 24, 1919. Serial No. 299,635.

To all whom it may concern:

Be it known that I, EDWARD G. BUDD, residing at Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Methods of Making Wheel Disks, of which I declare the following to be a full, clear, and exact description.

This invention relates to an improved method of making wheel disks, adapted to be employed in the manufacture of disk wheels such as are employed upon automobiles, trucks, tractors and the like.

One object of the invention is to provide a new and improved method of forming tapered wheel disks wherein the wheel disks are pressed into the desired form by a single rolling operation.

A further object of the invention is to provide an improved method of forming wheel disks by which a plurality of wheel disks may readily be formed from a continuous strip of metal.

Further objects of the invention relate to economies of manufacture and details of construction as will hereinafter appear from the detailed description to follow.

The objects of the invention are accomplished, in one instance, by the devices and means described in the following specification, but it is evident that the same may be varied widely without departing from the scope of the invention as pointed out in the appended claims.

A structure constituting one embodiment of the invention, which may be the preferred, is illustrated in the accompanying drawing forming a part hereof, in which:

Figure I is a view, partly in side elevation and partly in section, illustrating the position of the rollers, and the metal blank before and after the completion of the rolling operation.

Figure II is a top plan view of a portion of the metal blank after the completion of the rolling operation, illustrating the relative positions of the raised portions which form the wheel disks.

Figure III is a top plan view of one of the completed wheel disks, after having been cut from the metal blank and having a substantially central opening formed therein for the reception of the wheel hub.

Figure IV is a vertical sectional view, taken substantially along the line IV—IV of Figure III.

Figure V is a perspective view of the upper roller employed in rolling the metal blank.

Fig. VI is a front developed view of a portion of the roll, showing the elliptical character of the recess, the true circle being indicated by the dot and dash line.

Referring to the drawing, similar reference characters designate corresponding parts throughout the several views, and the sectional view is taken looking in the direction of the small arrows at the ends of the section line.

In the embodiment of the invention illustrated herewith, 1 and 2 designate the upper and lower rollers, respectively, of a pair of metal working rollers, which are positioned in proximity to each other, as illustrated in Figure I, and operate under a considerable degree of pressure so as to materially reduce the thickness of the metal blank passed therebetween and force a portion thereof into the recesses 3 formed in the outer surface of the upper roller in order to produce raised portions upon the surface of the rolled blank. The blank, in its original form, is designated by the numeral 4, and, as shown in Figure I, is of somewhat greater thickness and less width before being passed between the rollers 1 and 2, than is the rolled blank 5 illustrated in that figure. The blank 4 before being passed between the rollers 1 and 2 is preferably heated to such a degree as to render it readily workable when passed between the rollers 1 and 2. As the heated metal blank is passed between the rollers, which, as previously stated, are adapted to operate under a considerable degree of pressure, the metal of the blank is forced upward into the recess 3 formed in the upper roller 1 in such a manner as to completely fill the recess, and to impress upon the upper surface of the blank the outlines of the wheel disk.

Upon the completion of the rolling operation, the rolled blank 5 is provided upon its upper surface with a plurality of impressed outlines of wheel disks, wherein the central portions 7 are of greater thickness than the other parts thereof, and the portion 8 around the central portion 7 gradually decreases in thickness from the central portion to the

outer edge of the outline of the wheel disk. The portion 9 of the blank, which extends about the outline 6 of the wheel disk is thinner than any portion of the wheel disk outline which is formed upon the surface of the metal blank.

After the wheel disks have been impressed in outline upon the surface of the metal blank, it is necessary to cut each of the wheel disks thus outlined from the metal blank in any suitable manner so as to form the completed disk as illustrated in Figure III. An opening 10 is formed centrally of each disk which is adapted to pass over an axle hub in such a manner as to permit the wheel disk to be mounted upon the hub in a manner commonly employed in the manufacture of disk wheels. It will be seen, upon reference to Figure IV, that the central portion 7 of the wheel disk is of greater thickness than the remaining portion thereof, the outer portion 8 decreasing in thickness from the center to the circumferential edge thereof, thus providing a wheel disk which is of greater thickness near the central portion thereof and decreases in thickness towards the outer circumferential edge, thereby producing a wheel disk wherein superfluous metal is eliminated with a consequent reduction of waste, while the thicker portions are so positioned as to be located at the points which are apt to be subjected to the greatest strain during the use of the wheel.

Because of the fact that, in rolling, the sheet is elongated, the recesses 3 are oval or elliptical, that is, their diameter in the direction of the length of the sheet is less than in a direction transverse to the sheet. The original blank is somewhat less in diameter than the finished rolled sheet because the rolling tends to spread the metal at the sides.

It will be understood that this method of forming wheel disks provides a simple and convenient method for readily and easily forming wheel disks of the desired shape and form from an ordinary metal plate after the same has been properly heated. After the completion of the rolling operation, the metal blanks provided with impressions of wheel disks stamped thereon are blanked out so as to cut out the impressed wheel disks and the central opening 10 is then formed therein.

While I have shown and described in considerable detail a specific embodiment of my invention, it is to be understood that this showing and description is illustrative only, and for the purpose of rendering my invention more clear, and I do not regard the invention as limited to the details of construction illustrated or described, nor any of them, except in so far as I have included such limitations within the terms of the following claims, in which it is my intention to claim all novelty inherent in my invention broadly as well as specifically.

What I claim as new and desire to secure by Letters Patent is:

1. The method of forming a tapered wheel disk from a metal blank comprising passing said blank between a pair of rolls, one of which has an elliptical recess, with its major axis lengthwise of the roll, said recess increasing gradually in depth from the periphery to its center, and having a central elliptical recess of greater and uniform depth, with its major axis lengthwise of the roll.

2. A method of forming tapered wheel disks from a metal blank including as a step the passing of said blank between a pair of rolls, one of which has an elliptical recess, with its major axis lengthwise of the roll, said recess increasing gradually in depth from the periphery to its central portion.

In testimony whereof I affix my signature.

EDWARD G. BUDD.