No. 665,873. Patented Jan. 15, 1901.

E. G. BUDD.

SHEET METAL SPOKE BLANK.

(Application filed June 2, 1900.)

(No Model.)

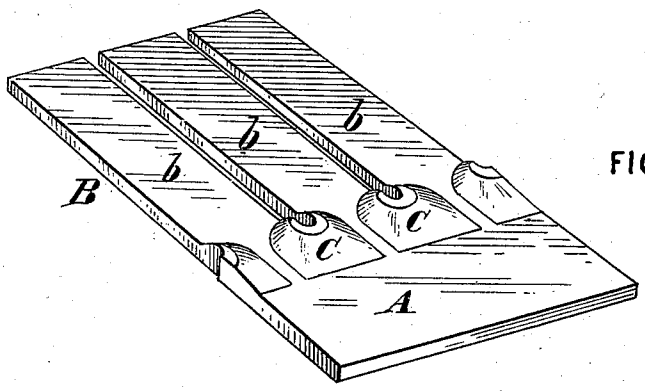


FIG. 1

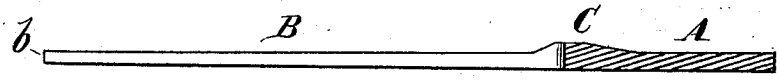


FIG. 2

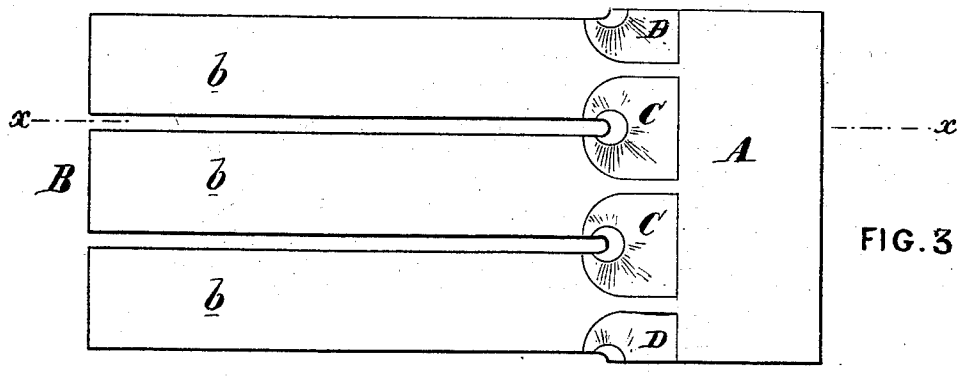


FIG. 3

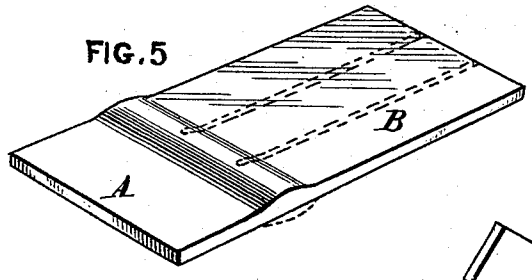


FIG. 5

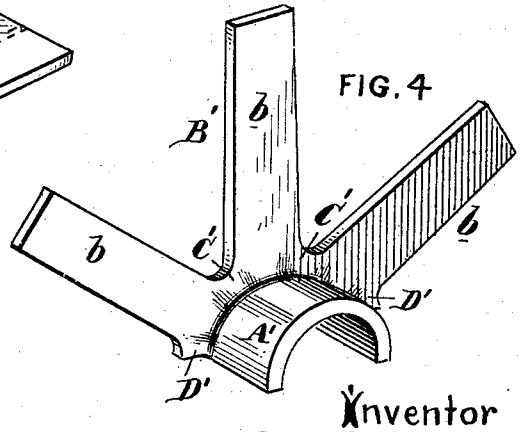


FIG. 4

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EDWARD G. BUDD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE AMERICAN PULLEY COMPANY, OF PENNSYLVANIA.

SHEET-METAL SPOKE-BLANK.

SPECIFICATION forming part of Letters Patent No. 665,873, dated January 15, 1901.

Application filed June 2, 1900. Serial No. 18,815. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. BUDD, of the city and county of Philadelphia, in the State of Pennsylvania, have invented an Improvement in the Construction of Sheet-Metal Spoke-Blanks, of which the following is a specification.

My invention has reference to the construction of sheet-metal spoke-blanks; and it consists of certain improvements fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

Heretofore it has been customary in the manufacture of sheet-metal pulleys to employ spoke-blanks stamped from sheet metal of the character shown in Letters Patent to Corscaden, No. 474,547, dated May 10, 1892, in which the thickness of the metal was made the same throughout and subsequently bent into a hub portion comprising a semicylindrical shell or palm and radial spokes extending from said palm and in which the separation of the spokes extended to the hub-palm.

The object of my invention is to produce a spoke-blank of same general character, but with a connecting web or flange between the roots of the spokes adjacent to the palm.

More specifically, my object is to so construct a blank that in its subsequent treatment the separation of the adjacent spoke-arms does not extend to the palm or semicircular hub portion and at the same time the desired thickness of metal of the arms and their connecting metal adjacent to the hub portion shall be maintained, thereby insuring increased strength at the root of the arm.

In carrying out my invention I roll the sheet-metal blanks in such a manner that an excess of metal is caused to be produced at a certain definite place or places upon the blank, which excess of metal is subsequently in the formation of the blank caused to supply what otherwise would be a deficiency and which by wire-drawing is reduced in thickness to approximately that of the metal employed in the spoke-arms.

The general construction of my improved blank will be clearly understood from the accompanying drawings, in which—

Figure 1 is a perspective view of the blank. Fig. 2 is a longitudinal sectional elevation of same on the line $x\,x$ of Fig. 3. Fig. 3 is a plan view of same. Fig. 4 is a perspective view of the completed spider, showing the formation of the metal between the radial spokes and the semicircular palm or hub portion. Fig. 5 is a perspective view of a modification of my blank.

A is the portion of the blank which is to subsequently form the palm or semicircular hub portion shown at A′ in Fig. 4.

B is the body metal of the blank, which is subsequently divided into the three tongues *b*, and these constitute in the finished article the radial spoke-arms B′. If desired, the separation of these parts *b* may be produced by a single slit or, more preferably, by the removal of a small strip of the metal, terminating at its inner end in a rounded portion, as shown, so as to avoid any abrupt angles. The metal of the blank between the spoke-arm portion B and the hub portion A is made thicker, as indicated at C, which part in the finished spider-blank corresponds to the semi-annular flange portion C′ between the spoke-arms and also between them and the semicircular hub portion. The greater the radial height of this part C′ the greater the thickness of the metal C in the blank will be required, because when the arms are bent into radial positions the wire-drawing action thins out this metal C to a thickness approximating that of the metal in the spoke-arms *b* or hub portion A. I have found in practice that it is not necessary to have the reinforcing metal C extend entirely across the blank, as these portions may be confined to the blank immediately adjacent to the inner ends of the slits D between the adjacent spoke-arms *b*, as is clearly shown in the drawings, it being essential at this place only to provide for the greatest amount of wire-drawing action. Substantially in a central line through the spokes there is but little wire-drawing, and for this reason the metal at these places may be reduced or approximately equal in thickness to the metal in the spoke-arms and increasing in thickness to a maximum a little to each side of the line of separation between the

spoke-arms, so that when the spokes are forced into a radial position the wire-drawing action will reduce the thickness of the metal throughout, so as to approximate that in the arms. I, however, do not limit myself to separating these reinforcing portions C, and, if desired, they may be formed continuous or connected across the blank, as indicated in Fig. 5, since this will give all the reinforcing action necessary and accomplish the same results, though perhaps not with the same uniformity in the thickness of the metal in the finished article. It would, however, tend to thicken the middle portion of the spoke-arms adjacent to the hub-palms and in some types of wheels might be considered an advantage. It is also evident that the transverse reinforcing portions when made continuous may be varied in thickness to suit the ideas of the designer and conditions of the work, extending on both sides, if desired.

I do not confine myself to the minor details of construction, as these may be modified without departing from the essential features constituting the novelty thereof.

While the greatest wire-drawing action takes place at the parts in line with the separation between the spokes, it is also to be understood that in the subsequent treatment in dies of special construction the excess of metal in the parts C is upset or driven downward toward the palm A and thickens the metal at the bend between the said palm A and portions C′ in the finished blank. This greatly strengthens the structure at what were heretofore its points of greatest weakness.

The above advantageous results are also secured by providing the blank with raised portions D corresponding to the portions C, but arranged at the outer edges of the blank, as these under the subsequent upsetting action of the dies spread the metal, as at D′ in Fig. 4, and materially thicken the plate at the juncture of the parts A and D′ by causing the metal of said projections D to largely flow toward the palm A. As there is no wire-drawing action of importance on these parts D, it is evident that they may be advantageously made of less size than the corresponding projections C. It is also evident that, irrespective of the shape or size given to these projections, the strengthening of the juncture of the spokes with the palm is secured by the subsequent upsetting action in shaping up the palm and setting the spoke-arms, and I therefore do not limit myself to any particular extent or shape of the raised portion or portions, so long as they are adequate to secure these results.

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

1. A sheet-metal blank from which to form a spoke-spider for a pulley, consisting of a flat metal sheet partly subdivided by parallel slits into a series of tongues, and in which the metal adjacent to the inner or closed ends of the separation between the tongues is reinforced so as to be of materially greater thickness than the metal in the tongues.

2. A sheet-metal blank from which to form a spoke-spider for a pulley, consisting of a flat plate having a transverse portion and a series of longitudinal parallel tongues at right angles to the transverse portion, and in which the thickness of the metal adjacent to the juncture of the tongues and transverse portion is increased over that of the transverse portion.

3. A sheet-metal blank from which to form a spoke-spider for a pulley, consisting of a plate having one or more slits beginning at one edge of the plate and extending over a greater portion of its length, and in which the plate is provided with an increased thickness of metal adjacent to and receiving the terminals of said slits.

4. A sheet-metal blank from which to form a spoke-spider for a pulley, consisting of a metal sheet tapering in thickness adapted to be slit from its thinnest edge partly across to form a series of tongues of gradually-increased thickness and having at a distance from the thicker edge or that opposite to the one adapted to be slit an increased body of metal to provide an amount of metal at that portion of the plate which will subsequently reinforce the root or base of adjacent radiating spoke-arms.

5. A sheet-metal blank from which to form a spoke-spider for a pulley, consisting of a metal plate having its thickness considerably increased at its lateral edges at a distance from the ends and nearer to one end of the plate than the other, and provided with one or more slits extending from the edge of the plate farthest from the reinforced or thickened portions and terminating in transverse alinement with said thickened portions.

In testimony of which invention I hereunto set my hand.

EDWARD G. BUDD.

Witnesses:
H. L. HINDLE, Jr.,
JOS. WALKER, Jr.