March 31, 1931. R. A. WALTER 1,798,347

METHOD OF MAKING CONVEYER ROLLERS

Filed Jan. 27, 1928

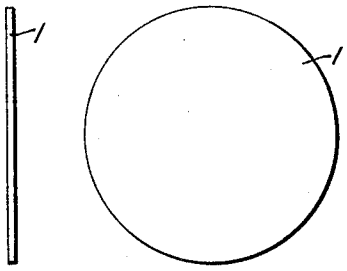

Fig.1

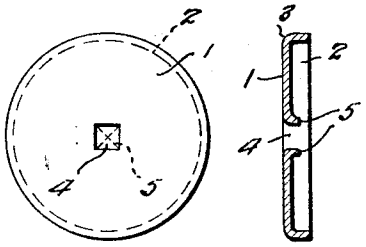

Fig.2

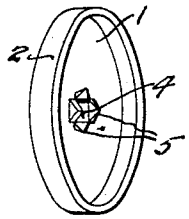

Fig.3

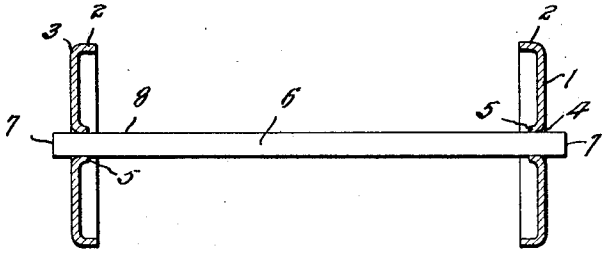

Fig.4

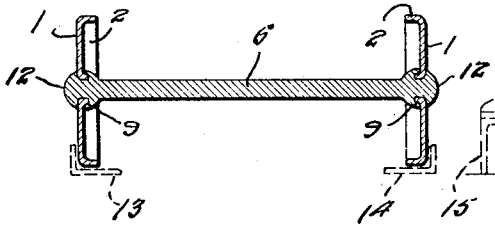

Fig.5

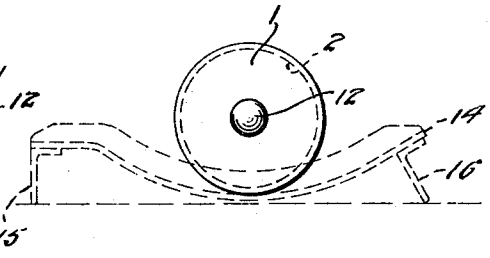

Fig.6

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Patented Mar. 31, 1931

1,798,347

UNITED STATES PATENT OFFICE

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METHOD OF MAKING CONVEYER ROLLERS

Application filed January 27, 1928. Serial No. 249,908.

This invention relates in general to rollers and more particularly has reference to forming and fixing rollers on axles for application under reciprocating conveyers.

Previous to this time, rollers of this character have usually been made of two cast iron or steel wheels assembled on a unitary shaft. The rollers have generally been cast with polygonal journals and the ends of the shaft squared to fit into the apertures, the rollers being fixed on by riveting.

These rollers have been liable to turn on the axle, and wobble during the operation of a conveyer unless the wheels are constructed excessively strong, in which instance the weight often operates to retard the movement of the conveyer to which they are attached, or been apt to break, being made of cast material. The tread on the wheels heretofore employed has been almost square and after a short period of use, a cutting edge is ofttime developed which becomes so sharp that it causes rapid wear on the track angles customarily used as the rolling bed and makes it necessary to frequently replace them.

An object of this invention is to provide a roller made of flanged or rolled material or constructed by drop forging.

Another object of this invention is to provide an assembly for rollers on an axle that will insure a permanent fixture.

Another object of this invention is to provide a roller that will not develop a cutting edge.

A further object of this invention is to provide a method of constructing a roller from a single piece of material.

A still further object of this invention is to provide a method for fixing a roller on an axle.

A still further object of this invention is to provide a method of fixing a roller on an axle so that the joint between the roller and the axle is practically a mono-ferric one without actual molecular adhesion.

With these and other objects in view which may be incident to my improvements, the invention consists in the parts and combinations to be hereinafter set forth and claimed, with the understanding that the several necessary elements comprising my invention, may be varied in construction, proportions and arrangement, without departing from the spirit and scope of the appended claims.

In order to make my invention more clearly understood, I have shown in the accompanying drawings means for carrying the same into practical effect, without limiting the improvements in their useful applications to the particular constructions, which for the purpose of explanation, have been made the subject of illustration.

In the drawings forming a part of this specification there is shown:—

In Figure 1 a side elevational and front elevational view of the disk of which the roller forming the subject matter of this invention is constructed.

There is shown in Figure 2 a front elevation plan view of the roller.

There is shown in Figure 3, a perspective view of the roller.

In Figure 4 there is shown a plurality of rollers mounted on an axle.

In Figure 5 there is shown a sectional view of a plurality of rollers fixed on an axle according to the method forming the subject matter of this invention, and operating on a plurality of axle tracks shown in plan.

In Figure 6 there is shown a phantom view of a roller operating on an axle track shown in plan.

Referring by numerals to the drawings in which the same and similar elements are designated by like symbols of reference throughout and more particularly to Figure 1 there is shown a circular disk 1 which has preferably been punched or cut from a sheet of metal, forming the roller in the first stages of manufacture, according to this invention. The disk is cut or punched larger in circumference than the desired size of the finished roller, according to the desired width of the flange which is subsequently formed on the periphery of the disk. The disk as shown in Figure 2 is bent over adjacent its circumferential edge and a flange 2 thus formed. The flange as shown at 3 extends at right angles to the vertical face of the roller 1 and thus affords a rolling surface or tread for the roller.

Concomitantly with the turning over of the flange it is preferred to punch the center of the disk with the polygonal tool so that the metal broken away by the impact of the punch forms a series of triangular projections 4.

While the hole 5, as shown in Figure 2, is of square configuration, it may be punched with any desired shape tool other than a polygonal one. In this manner, the aperture may be punched so that any desired number of projections may be formed, although a square hole with four triangular projections is preferred.

The two rollers, constructed in the manner hereinbefore described, are then mounted on a unitary axle 7 made of ordinary commercial iron, or steel, or any other material found desirable. One end of this shaft 7 is brought to a welding heat previous to the mounting of the roller and inserted in the apertures 5 of one of the discs. The shaft 6 is then grasped at point 8 by a clamp or other tool which is fixedly mounted and formed with a concave depression at the end adjacent the face of the roller. A die having a similar concavity is brought into position over the end 7 of the shaft 6 on the opposite side of the disc and slowly propelled under heavy pressure toward the fixed clamp holding the shaft at 8. In this manner the metal of the shaft is forced into all the irregularities of the roller as shown in Figures 2 and 3, around the projections 5 and over the outside face of the disc until it completely fills and takes the form of the concavities in the clamp and die as shown at 9 and 12 respectively, whereupon they may be removed after the metal is sufficiently cooled. The cooling of the shaft against the unheated sides of the roller causes a shrinking of the shaft that sets up longitudinal strains that insures a rigid joint.

Representation of the clamps and dies has been omitted from the drawings as these are conventional tools and well understood in the art. The opposite roller is mounted and fixed on the other end of the axle 6 in the same manner as the roller 1. The completed assembly of the two rollers fixed on the opposite end of the axle 6 as shown in Figure 5, is adapted to rest on a plurality of angular conveyer tracks 13 and 14, with the axle rolling free under the bottom of a conveyer trough in the usual manner.

There is accomplished by this invention, a method of making rollers from discs cut from sheet metal, by a combination flanging and punching process, with a rounded tread that will not cut into conveyer tracks, the rollers being fixed on an axle by upsetting, thus producing a practically mono-ferric article without actual molecular adhesion, so that the cooling of the metal of the shaft against the already cool and the unheated journal of the roller causes a shrinking in the section of the shaft pressed between the opposite faces of the roller that insures an exceedingly strong, permanent joint, that will not allow the rollers to wabble.

While I have shown and described the preferred embodiment of my invention, I wish it to be understood that I do not confine myself to the precise details of construction herein set forth, by way of illustration, as it is apparent that many changes and variations may be made therein, by those skilled in the art, without departing from the spirit of the invention, or exceeding the scope of the appended claims.

I claim:—

1. A method of fixing a conveyer roller on an axle comprising inserting the end of the axle in the journal of the roller and upsetting the axle against the opposite faces of the roller the journal being formed with jagged outwardly projecting edges.

2. A method of forming and fixing a conveyer roller on an axle comprising punching a journal with jagged outwardly projecting edges in the center of the roller, inserting the end of the axle in the journal and upsetting the axle against the opposite faces of the roller.

3. A method of forming and fixing a conveyer roller an on axle comprising punching a polygonal journal with extending triangular projections in the center of the roller, inserting the end of the axle in the journal and upsetting the axle against the opposite faces of the roller by fixing a clamp having a concave face on the axle adjacent the projections on the roller and propelling a die having a concave face against the end of the axle toward the clamp.

4. A method of forming and fixing a conveyer roller on an axle comprising, punching a journal with jagged outwardly projecting edges in the center of the roller, inserting the end of the axle in the journal, forming the axle against the opposite faces of the roller and shrinking the journaled axle.

5. A method of forming and fixing a conveyer roller on an axle comprising punching a journal with jagged outwardly projecting edges, in the center of the roller, inserting the end of the axle in the journal and upsetting the axle against the opposite faces of the rollers, the edges of the journal having jagged projections to prevent relative movement between the roller and axle.

In testimony whereof I hereunto affix my signature.

RAYMOND A. WALTER.