Nov. 19, 1929. C. F. BALL 1,736,758

METAL GEAR RIM AND METHOD OF MAKING SAME

Filed March 29, 1927

FIG. 1.

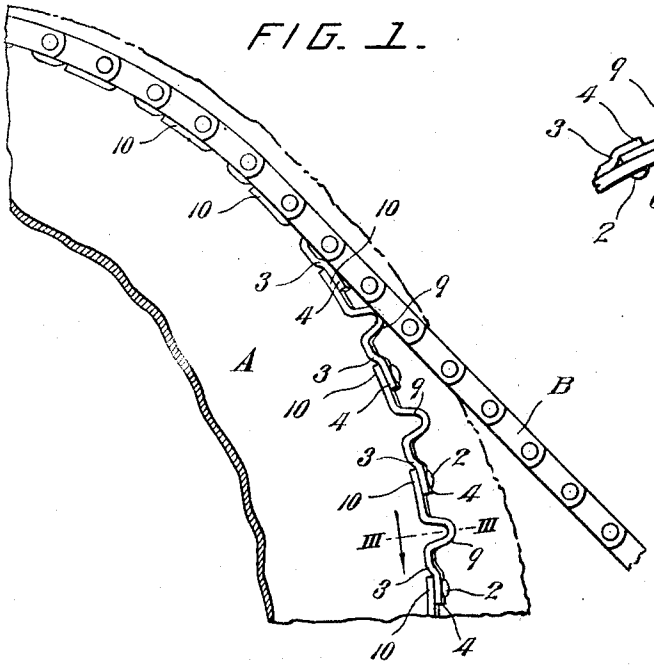


FIG. 4.

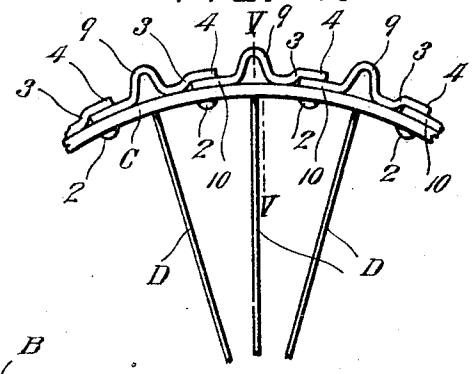
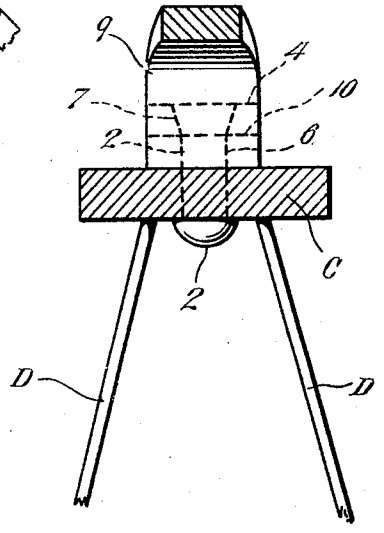


FIG. 5.



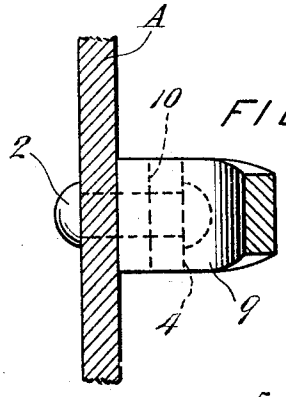


FIG. 3.

FIG. 6.

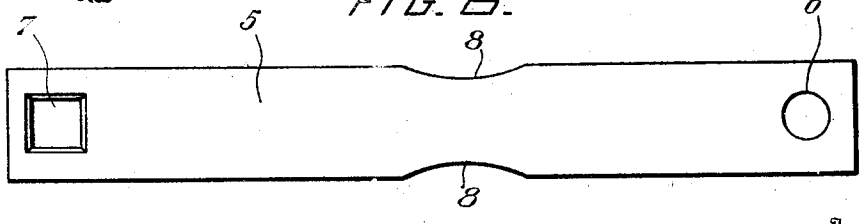
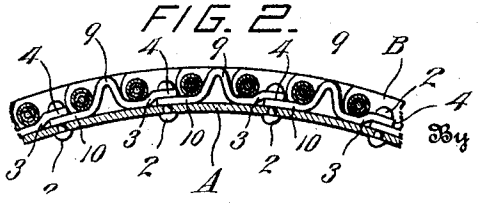


FIG. 2.



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UNITED STATES PATENT OFFICE

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METAL GEAR RIM AND METHOD OF MAKING SAME

Application filed March 29, 1927. Serial No. 179,277.

This invention relates to the manufacture of metal gear rims in which the gear teeth are formed by bending the metal into shape to form the teeth, the special application of my invention, illustrated in the drawings and to be hereinafter described, being for the manufacture of sectional pressed steel sprocket rims.

In the accompanying drawings Fig. 1 is a broken perspective view illustrating my invention applied to the periphery of a rotating drum of a concrete mixing machine adapted to be driven by a sprocket chain.

Fig. 2 is a longitudinal sectional view of the invention as represented in Fig. 1.

Fig. 3 is a transverse sectional view, enlarged, taken on the line III—III of Fig. 1.

Fig. 4 is a side view representing a segment of a wheel to which my invention is applied.

Fig. 5 is a transverse sectional view, enlarged, on the line V—V of Fig. 4.

Fig. 6 is a plan view of a blank from which one section of a sprocket segment is produced, after it has been subject to certain fabricating steps.

In the accompanying drawings A represents the shell of a concrete mixing drum, to the periphery of which is secured a sprocket rim made according to my invention, with which rim there engages a sprocket chain B of well known construction by which the drum is rotated. To the peripheral surface of the drum A are applied separate sections of metal, such as steel, shaped to form sprocket teeth 9, adapted to be engaged by the links of a sprocket chain such as that indicated at B. The sprocket rim is secured fast to the periphery of the drum by rivets 2 or by other suitable means. As stated the sprocket rim is made up of sections, which may be longer or shorter as desired, each section being formed into one or a plurality of teeth. There are some advantages in making the sections short, and each one with a single tooth, and that form of the invention is illustrated in the drawings. As there illustrated the teeth-carrying sections are formed from blanks 5, Fig. 6, these being cut from bar metal of suitable size and cross dimensions to suit the particular use to which the sprocket is to be put and the size of chain with which it cooperates. A bar of such metal is cut into lengths to produce the blanks which are each shaped by suitable machinery to form a tooth 9, or several such teeth, if that be desirable. As represented the blank, preferably while flat, is sheared at its sides as at 8, 8, and is punched near its ends, as at 6, 7. The blank is thereafter curved to fit the surface of the article to which it is to be applied and secured; and is folded or bent reversely at the portion reduced in width by shearing to produce a tooth 9. When the blank is shaped to form but a single tooth the two end portions thereof, extending in opposite directions from the tooth, are preferably of unequal length, and the longer of these is formed with an offset bend 3, so that the extreme end portion 4 of the blank, beyond said offset 3, stands away from the surface to which the blank is secured. This permits the end 4 of one section to overlie the opposite end 10 of the next adjacent blank, as clearly represented in Figs. 1 and 2. When the sections thus shaped are applied, as described, to the article to which they are to be secured, the periphery of a concrete mixing drum for instance, the perforations 6, 7, in adjacent sprocket sections register, and rivets 2 may be passed through them and registering openings formed in the material of the drum and then headed to securely unite the sprocket sections to each other and secure them to the drum. When thus applied the heads of the rivets 2, which are shown in Figs. 1 and 2, project above the uppermost of the overlapping ends of the sprocket sections and are located midway between sprocket teeth 9. In the use of sprocket chain for rotating the mixing drum of a concrete mixer the drum sprocket is necessarily of large diameter as compared to the driving sprocket, and as a result it carries a very much larger number of sprocket teeth. It has been found in practice that there is great advantage attained by leaving out every other tooth in the sprocket rim of the drum, that is the distance between the teeth of the sprocket rim applied to the drum is twice the distance

between the teeth of the driving sprocket, the result being that only every other link of the chain engages with a sprocket tooth in passing about the drum. In making the drum-carried sprocket rim of pressed steel segments made and secured to the drum as described the overlapping ends of the sprocket sections and the exposed heads of the attaching rivets occupy the positions of the missing teeth of the sprocket rim, but this in no wise interferes with the proper working engagement between the sprocket chain and the sprocket rim because these projecting parts may enter between the side bars of the links that are not engaging sprockets of the drum sprocket ring, as clearly represented in Fig. 2.

The reason for shearing the blank 5, as indicated at 8, is to somewhat reduce the width or transverse dimension of the sprocket tooth at its outer end to permit the easy and certain entrance of the tooth into the spaces between the side bars of the chain links. The particular manner and extent to which the blanks are sheared determines to a certain extent the shape of the teeth, which can thus be made to best suit the chain with which the sprocket is to be used.

In Figs. 4 and 5 I represent my invention applied to the rim C of a wheel, the spokes of which are designated D. As represented the heads of the rivets 2 that unite the sprocket sections to the rim of the wheel are flush with the upper surfaces of the overlapping ends 4 of the sprocket sections. To permit this the perforations 7 through the blank 5 are larger than the perforations 6 at the opposite ends and are of a shape to fit the heads of the rivets, as represented in Fig. 6.

It will be evident to those skilled in the art that my present invention is adapted for other uses than those represented. It should therefore be understood that the invention is not to be limited by the specific disclosures in the drawings hereof or beyond what is set forth in the following claims.

What I claim is:

1. A metal gear rim adapted to be secured to a suitable support, consisting of identical tooth sections bent to form gear teeth, and having portions extending beyond the teeth in both directions and adapted to rest upon and be secured to the support, the extensions of adjacent sections being arranged to overlap each other.

2. A metal gear rim adapted to be secured to a cylindrical supporting body that is to be rotated, consisting of identical sections formed from bar metal bent to form gear teeth and having portions extending beyond the teeth in both directions and curved to suit the support to which they are to be applied, the extensions of adjacent sections being arranged to overlap each other and perforated to receive attaching bolts or rivets.

3. A metal sprocket rim adapted to be secured to a cylindrical supporting body that is to be rotated, consisting of identical tooth sections bent to form sprocket teeth, the teeth being narrower transversely at their outer ends than at their bases and the sections having portions extending from the bases of the teeth in opposite directions, curved to fit the support to which the sections are to be applied, the extensions of adjacent sections overlapping when the sections are fitted together end to end to constitute the rim.

4. A metal sprocket rim secured to a cylindrical supporting body of relatively large size that is to be rotated, consisting of identical tooth sections bent to form sprocket teeth, the sections having portions extending from the bases of the teeth in opposite directions, curved to fit the support to which the sections are to be applied, the extensions of adjacent sections overlapping when the sections are fitted together end to end to constitute the rim and being of a length to cause the pitch distance between successive sprocket teeth to equal twice the pitch of the links of the chain with which the sprocket rim is to engage.

5. A blank for use in making a sprocket rim with teeth tapering transversely at their outer ends, formed from a strip of metal, the strip, intermediate its ends, being of reduced width and perforated near its opposite ends.

6. A sprocket gear section to be used in the formation of a sprocket rim formed from a strip of metal whose intermediate portion is reduced in width and is reversely bent at said portion of reduced width to form a sprocket tooth that tapers transversely toward its outer end, the section having perforated end portions that extend in opposite directions from the base of the sprocket tooth.

7. A sprocket gear section such as described in claim 6, having one of the portions extending from the base of the tooth formed with an offset bend adapting said portion to overlie a projecting portion of an adjacent section as the sections are applied end to end to form a rim.

8. The process of making a gear rim, which consists in forming blanks from strip metal, shearing the edges of the blanks to produce intermediate sections of reduced width, reversely bending the portions of the blanks where they are of reduced width to form gear teeth, leaving portions of the blanks extending in opposite directions from the bases of the teeth for attachment.

9. The process of making a sprocket gear rim which consists in forming identical blanks from strip metal, shearing the edges of the blanks to produce intermediate sections of reduced width and perforating the blanks near their ends, reversely bending the portions of the blanks where they are of

reduced width to form sprocket gear teeth, leaving portions of the blanks extending in opposite directions from the bases of the teeth for attachment, and curving the blank as a whole to fit the periphery of the support to which it is to be applied.

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