

(No Model.)

P. FORG.
SPROCKET WHEEL.

No. 550,749.

Patented Dec. 3, 1895.

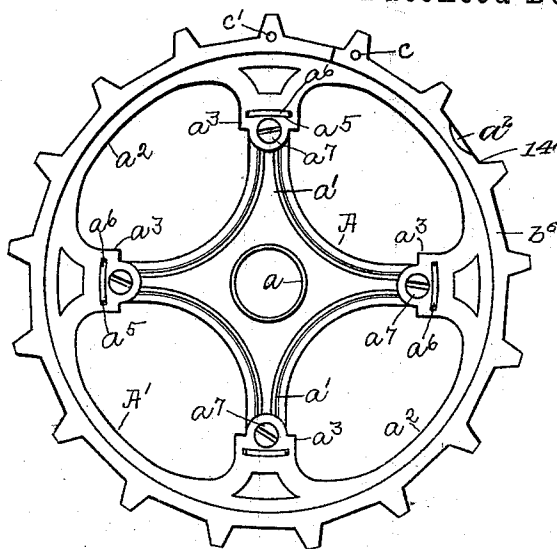


Fig. 1.

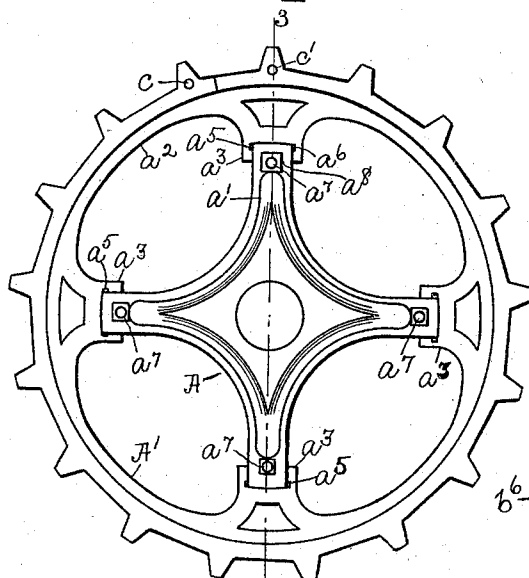


Fig. 2.

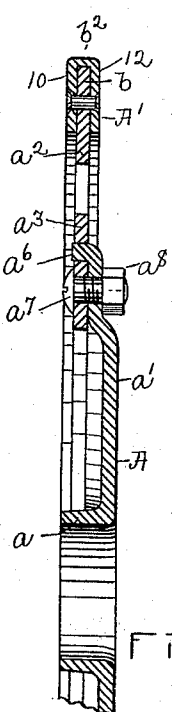


Fig. 3.

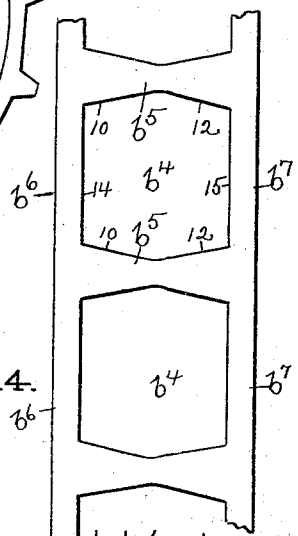


Fig. 4.

WITNESSES.
Matthew M. Blunt
J. Murphy

INVENTOR.
Peter Forg
By Jas. H. Churchill
ATT'Y

UNITED STATES PATENT OFFICE.

PETER FORG, OF SOMERVILLE, MASSACHUSETTS.

SPROCKET-WHEEL.

SPECIFICATION forming part of Letters Patent No. 550,749, dated December 3, 1895.

Application filed May 8, 1895. Serial No. 548,486. (No model.)

To all whom it may concern:

Be it known that I, PETER FORG, residing in Somerville, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Sprocket-Wheels, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention relates to a chain or sprocket wheel especially designed and adapted for use on bicycles and like vehicles.

15 The sprocket-wheel herein shown as embodying this invention is composed of a rim portion detachable from the center or body of the wheel; and one feature of this invention consists in an improved interlocking of these parts whereby they may be more securely and effectually secured together.

20 Another feature of this invention consists in providing the teeth of a sprocket-wheel with superior wearing-surfaces, which are preferably integral with each other and formed from a single piece of metal, as will be described.

25 These and other features of this invention will be pointed out in the claims at the end of this specification.

30 Figure 1 is an elevation of one side of a sprocket-wheel embodying this invention; Fig. 2, an elevation of the opposite side of the wheel shown in Fig. 1; Fig. 3, a sectional detail, on an enlarged scale, of the wheel shown in Figs. 1 and 2, the section being taken on the line 3-3, Fig. 2; and Fig. 4, a detail, on an enlarged scale, to be referred to.

35 The sprocket-wheel herein represented as embodying my invention may and preferably will have its center or body portion A detachably secured to the rim A'; but the improvement in the construction of the rim, which will be hereinafter specifically pointed out, may be embodied in sprocket-wheels in which the center or body is not detachable from the rim portion.

40 In bicycles as now commonly constructed it is especially desirous to reduce the weight of the various parts to a minimum without sacrificing strength, and in order that this result may be accomplished with relation to the sprocket-wheel I prefer to make the said sprocket-wheel after the manner herein

shown. In accordance with this invention, therefore, the center or body portion A and the main portion of the rim A' are struck or 55 died out of sheet metal, preferably soft or mild steel, while the wearing portion of the said rim and teeth are also struck or died out of a harder or superior grade of steel, preferably tool-steel. 60

The body or center A is preferably composed of a hub *a* and spokes or arms A', which for the best results are offset for the greater portion of their length with relation to a vertical plane extended through the center of the rim and the hub. The main portion of the rim consists of a substantially narrow ring *a*², preferably of soft steel, having a series of inwardly-projecting arms *a*³, corresponding in number to the spokes or arms *a*', and either 70 the spokes *a*' are made wider than the arms *a*³ or vice versa, so that the wider part may be provided with a slot or recess into which a flange, finger, or interlocking projection on the other part may fit somewhat snugly to join or connect together the said parts. In the present instance the arms *a*³ of the ring *a*² are made wider than the spokes *a*', and the arms *a*³ are each provided with a slot *a*⁵, into which projects a bent finger or flange *a*⁶ on 80 the spoke *a*', which in the construction herein shown constitutes the interlocking projection, the said finger or flange fitting the slot *a*⁵ somewhat snugly, so as to lock the rim and center of the wheel together. 85

The spokes *a*' and arm *a*³ may be firmly, but detachably, secured together by screws or threaded rods or bolts *a*⁷, inserted through a suitable opening in the arms *a*³ and into and preferably through a threaded hole or opening in the spoke *a*', and, if desired, the threaded end of the screw or bolt *a*⁷, projecting beyond the spoke *a*', may be provided with a nut *a*⁸, as represented in Figs. 2 and 3; but this nut is not absolutely essential and may be dispensed with. In this case the end of the screw-rod or bolt *a*⁷ may be flush with the outside of the spoke *a*'. 90

The screw-rods or bolts firmly fasten together the two parts of the sprocket-wheel; 100 but this construction, broadly speaking, I do not claim, as sprocket-wheels of this construction have heretofore been made; but this construction of sprocket-wheel is objectionable,

as in practice a very considerable strain comes upon the screw-rods or bolts, which soon work loose, thereby destroying the effectiveness of the wheel.

5 By my improved construction it will be seen that the strain comes upon the interlocking parts, which are fitted snugly together, and the two parts of the wheel are locked against movement with relation to each other, and
10 consequently the screw-rods or bolts are relieved from strain and do not work loose, so that the sprocket-wheel made in two parts, as herein shown, is as strong as if the spokes and rim were integral. This feature of my
15 invention may be embodied in a sprocket-wheel in which the rim may be of any desired or suitable construction; but I prefer to make the rim after the manner herein shown.

In accordance with this second feature of
20 this invention the ring a^2 is provided at suitable intervals about its periphery with teeth b , which are preferably integral with the said ring, the said teeth, ring, and arms a^3 being preferably made of soft or mild steel to obtain the desired strength, and the said parts
25 are preferably cut out of sheet stock in one piece.

When the teeth b are made of soft or mild steel, they are preferably reinforced with jackets
30 b^2 , preferably of harder metal, such as tool-steel, which jackets constitute the wearing-surface for the teeth and take the wear of the link-chain commonly employed on bicycles.

35 The jackets b^2 for the teeth b of the rim may be made integral or separate; but I prefer to make them integral with each other, which result may, and preferably will, be accomplished as will now be described.

40 A flat strip of sheet metal, preferably tool or hardened steel, of the desired width, is cut out by a suitable die, (not shown,) so as to leave openings b^4 , separated by cross-pieces or end walls b^5 and bounded by side walls $b^6 b^7$, after
45 the manner shown in Fig. 4. The opening b^4 is preferably made hexagonal in shape, and the end walls b^5 are each composed of frustum-shaped parts 10 12, the bases of which parts are joined with the side walls or bars b^6
50 b^7 , and the narrower portions of which parts are united substantially on a central line, so that the strip thus formed may be bent longitudinally on a central line, which bending may be effected by acting upon the flat strip
55 with suitably-shaped dies or rolls, which give to the bent strip an annular form approximating the form of the sprocket-wheel rim.

By the operations just described the parts 10 12 are shaped to fit over and embrace the
60 teeth b of the rim, while the side walls $b^6 b^7$ embrace the opposite sides of the ring a^2 , and the inner edges 14 15 of the side walls $b^6 b^7$ of each opening are substantially flush with the outer circumference of the ring a^2 and constitute wearing-surfaces for that portion of
65 the ring a^2 between the teeth b .

When the reinforcing-strip shown in Fig. 4

is shaped as described and applied to the ring a^2 , after the manner represented in Figs. 1, 2, and 3, the ends of the reinforcing-strip
70 may be brazed together, or the strip may be fastened on opposite sides of the point of contact of the two ends of the reinforcing-strip by means of rivets or pins $c c'$, inserted through
75 the reinforcing-strip and the ring a^2 or in any other suitable manner. This construction of the rim portion of the sprocket-wheel permits the ring a^2 to be made of substantially thin metal and of a soft steel to obtain increased strength, while at the same time the wearing-
80 surface of the sprocket-wheel is of the desired hardness. This reinforcing feature of my invention when coupled with the interlocking feature of the invention produces a sprocket-wheel which is light, yet strong and
85 cheap to manufacture. I, however, do not desire to limit the reinforcing feature of this invention to a sprocket-wheel made in two parts and interlocked, as described, as the reinforcing feature may be applied to a sprocket-
90 wheel in which the rim and center or body are in one piece, and in this case the center or body and rim may be made of a soft steel to obtain increased strength, and the desired hardness may be obtained by the reinforcing
95 band or wearing-surface.

I prefer that the reinforcing wearing-surface should be made after the manner above described—that is, with the jackets for the teeth b connected by the side walls $b^6 b^7$; but
100 I do not desire to limit my invention to a reinforcing wearing-surface in which the jackets for the teeth are connected together, as each jacket may be separated from its adjacent jacket and riveted or otherwise suitably secured to the rim of the sprocket-wheel.
105

By reference to Figs. 1, 2, and 3 it will be seen that the spokes are made by offsetting or dishing out a piece from which the spokes are formed, which offset construction gives
110 increased strength to the sprocket-wheel and permits the center of the wheel to be made very light and of a minimum amount of metal.

In order to obtain a substantially long bearing for the shaft, the hub a is pressed or drawn
115 out to elongate the same.

Believing myself to be the first to construct a sprocket-wheel with interlocking rim and spokes, whereby the fastening screws or devices are relieved from strain, I do not desire
120 to limit my invention to the particular construction shown.

I claim—

1. In a sprocket wheel, the combination of the following instrumentalities, viz:—a metal
125 rim provided with teeth, a center or body portion detachably secured to the rim and interlocked therewith by the engagement of one part with a slot or recess in the other part, and devices extended through the said inter-
130 locked parts to firmly but detachably secure said parts and which devices are relieved from strain by the interlocking of the said parts, substantially as described.

2. In a sprocket wheel, the combination of the following instrumentalities, viz:—a metal rim provided with teeth integral therewith and composed of a substantially soft metal, a metal body or center interlocked with said rim, devices extended through the said interlocking parts to firmly but detachably secure the said parts together and which devices are relieved from strain by the interlocking of said parts, and metal jackets for the said teeth composed of a superior metal and embracing only the sides of the teeth and forming superior wearing surfaces therefor, substantially as described.

3. In a bicycle sprocket wheel, the combination of the following instrumentalities, viz:—a metal rim provided with teeth integral therewith and composed of a substantially soft metal, and a reinforcing metal strip provided with openings separated by cross pieces and connected side walls, the said strip being composed of a harder metal than the rim and being longitudinally bent on a substantially central line to form the cross pieces into jackets to embrace the sides of the teeth and form the wearing surfaces thereof, and leave

the side walls embracing the sides of the rim and forming the wearing surfaces thereof between the teeth, substantially as described.

4. In a sprocket-wheel, the combination of the following instrumentalities, viz:—a metal rim provided with teeth, a center or body portion attached to said rim, and a reinforcing connected jacket embracing both sides of the said teeth and the said rim, and consisting of a metal strip provided with openings separated by cross pieces and connected side walls, and bent longitudinally on a substantially central line, the said cross pieces embracing the sides of the teeth and the said side walls embracing the sides of the rim, the openings in the jacket leaving uncovered the front and rear ends of the teeth and the outer circumference of the rim between the teeth, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PETER FORG.

Witnesses:

JAS. H. CHURCHILL,
HERMAN FORG.