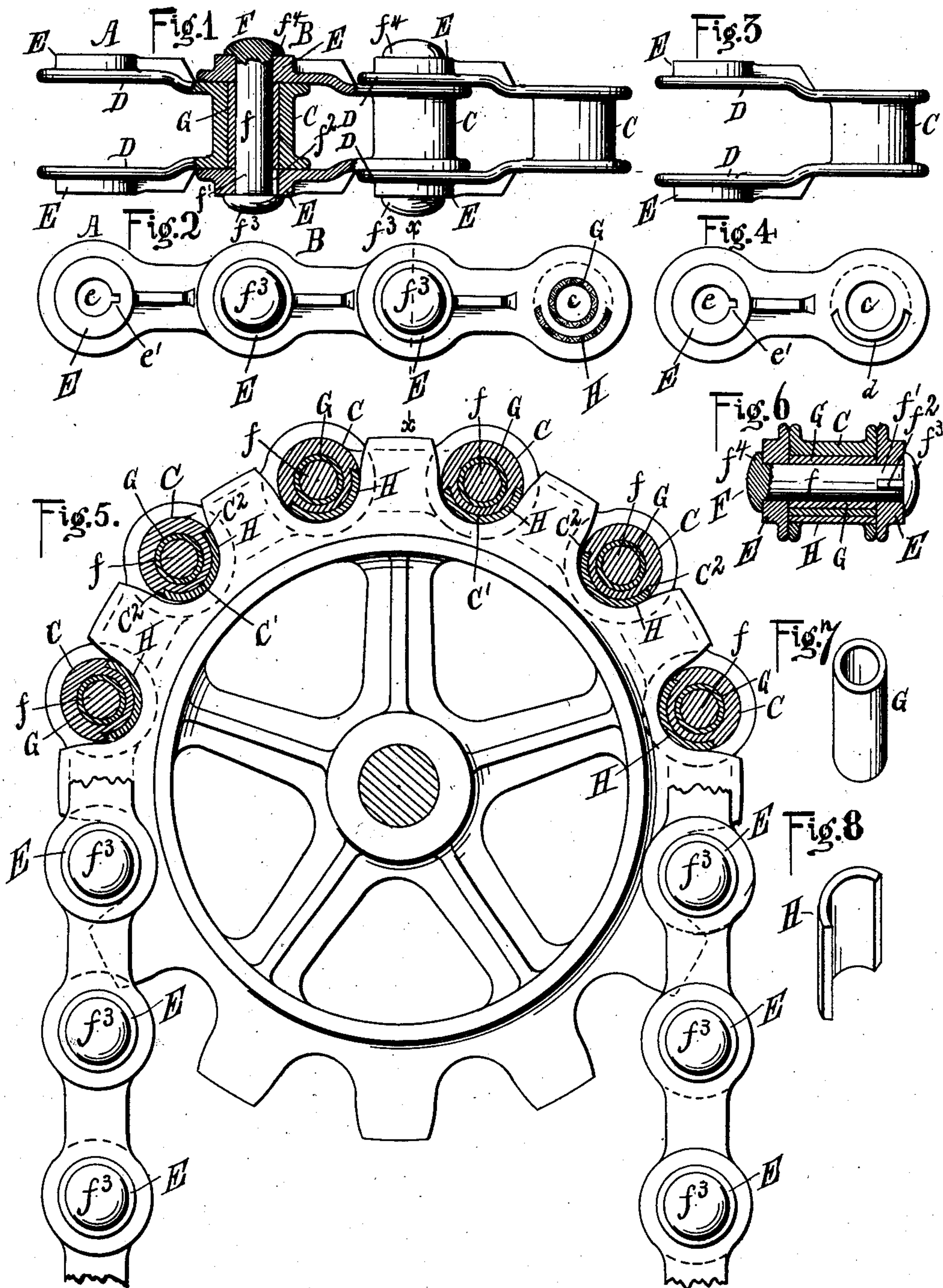


No. 839,849.

PATENTED JAN. 1, 1907.

G. C. HORST.  
SPROCKET CHAIN.  
APPLICATION FILED JAN. 4, 1902.



Witnesses.  
C. H. Woodward  
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# UNITED STATES PATENT OFFICE.

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## SPROCKET-CHAIN.

No. 839,849.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed January 4, 1902. Serial No. 88,374.

*To all whom it may concern:*

Be it known that I, GEORGE CONRAD HORST, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Sprocket-Chains, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in chain-links, having for its purpose to strengthen them, make them more durable, and prevent their deteriorating under the wear and strains to which they are subjected  
15 when in use.

Figure 1 is a top plan view, partially in section, of a sufficient portion of a chain to illustrate my invention. Fig. 2 is a side view of the same. Fig. 3 is a plan view, and Fig. 4 is  
20 a side view, of one of the links detached. Fig. 5 is a view of a sprocket-wheel with a portion of chain partially in section shown in position thereon. Fig. 6 is a section on the line  $xx$  of Fig. 2. Fig. 7 is a perspective view of the  
25 pintle-bushing detached. Fig. 8 is a similar view of the external wear-plate detached.

In the drawings, for the purpose of illustration I have shown my improvements as applied to a chain in which the links are counterparts one of the other and each of which is approximately U-shaped—that is, has a cross-bar at one end from which there extend  
30 two side bars which are separated at their ends opposite to the cross-bars; but it will be understood that the features of invention are not limited to links of this precise form, as they can be applied in chains of modified character.

Referring to the drawings, A indicates one  
40 of the links of the chain, and B the adjacent one. I thus designate them differently merely for convenience in the description and not because of difference of structure, and therefore the parts of but one need be referred to in detail. Each has a cross-bar  
45 C and the two side bars D D. As shown, these are formed integral with each other of cast metal. The side bars are enlarged at their ends, as shown at E E, to provide sufficient metal to insure strength, and these  
50 separated ends are formed with pintle-apertures  $e e$ , one or both apertures having a lateral slot or groove, as shown at  $e'$ .

F indicates the pintle, which forms one of

the elements for articulately connecting each  
link to the next. This pintle has the cylindrical journal part  $f$ , the neck parts  $f'$ , a fin or web  $f^2$ , a head  $f^3$ , and means at  $f^4$ —such as a rivet-head, a cotter-pin, a nut, or the like—  
60 for preventing the pintle from displacement. That end of the next link which has the cross-bar fits between the ends D D.

The cross-bar C is a tube having a central aperture  $c$  of a diameter larger than that of the pintle F. Into this aperture is fitted a  
65 bushing or wearing tube G.

The parts C and D of each link are preferably formed of cast metal, which for good results can be malleableized. The bushing-tube or wearing-sleeve G is of steel of such  
70 consistency as to reduce the wear and prolong the operative life of the sleeve. The pintle being locked against rotation in the link A, the motions of articulation consist of rocking or vibrations of the link B around the pintle,  
75 and an extended wearing-surface is provided, as the pintles cannot rotate in the side bars of the link A, but must rock in the steel sleeve or tube.

H indicates a plate, block, or suitably-shaped body of steel secured to the cross-bar C and so arranged as to take the wear and friction experienced by the link as it passes around the driven sprocket-wheel or around the driven wheel or idler. As shown, this  
80 external wearing-body of steel is applied by forming an aperture  $d$  in one or each of the side bars at points adjacent to the cross-bars. The steel wearing-piece is convex on its exterior periphery and is preferably concave  
90 on its inner surface, though this contour can be varied. This part H is put in place by driving it through one of the apertures  $d$  and causing it to be seated snugly in the recess C', which is formed in the lower part of the  
95 tubular cross-bar. Preferably the edges of the steel part H are beveled, as shown, so as to fit into correspondingly-beveled recesses at C'. When the steel has been put in place, its exterior surface forms substantially a con-  
100 tinuation of the cylindrical surface of the cross-bar C, so that both the cast-iron and the steel bodies are substantially concentric to the pintle-axis.

In Fig. 5 I have shown the relations of the  
105 cross-bars to the sprockets of a wheel to illustrate the manner in which the purpose is accomplished at which I aim.



The malleable iron is rapidly worn, as is well-known, when it comes in contact with the wheels, and chain-links are soon impaired as a result of the rubbing and motions that are experienced by the links moving around the teeth of the wheel. This is very largely overcome by links constructed in the way illustrated and described.

What I claim is—

10 1. A chain-link having a cross-bar with an axial aperture and a recess in its periphery, two side bars having apertures arranged to register with the recess in said cross-bar and a wearing-plate seated in said recess and hav-  
15 ing its ends extending into the apertures in the side bars.

2. A chain-link having two side bars and a cross-bar, the two side bars having perforations adjacent to the outer surface of the  
20 cross-bar, a steel wearing-body inserted in said apertures and arranged adjacent to and adapted to bear inwardly against the said cross-bar, substantially as set forth.

3. A chain-link formed of two side bars  
25 and an end bar all integral, said end bar having an axial aperture, a wearing-piece, concavo-convex shape in cross-section, having its ends detachably secured in said side bars

and its concave surface adjacent to the periphery of the end bar, and a bushing loosely  
30 mounted in said end bar.

4. A chain comprising a series of counter-part links, each link being formed with two side bars and an integral cross-bar, the cross-bar having an axial passage-way therethrough  
35 and the side bars having at their free ends passage-ways therethrough adapted to register with the axial aperture in the end bar of the adjacent link, the said side bars having  
40 curvilinear slots therethrough adjacent to the periphery of the cross-bar, the concavo-convex wearing-plate having its ends inserted in said slots and its inner surface adapted to bear against the adjacent cross-  
45 bar, the cylindrical bushing loosely mounted in said axial passage-way in the cross-bar, and the pintle extending through the said bushing and adapted to connect the said cross-bar to the side bars of the adjacent link.

In testimony whereof I affix my signature  
50 in presence of two witnesses.

GEORGE CONRAD HORST.

Witnesses:

W. S. CAUGHEY,  
R. A. COOKE.