

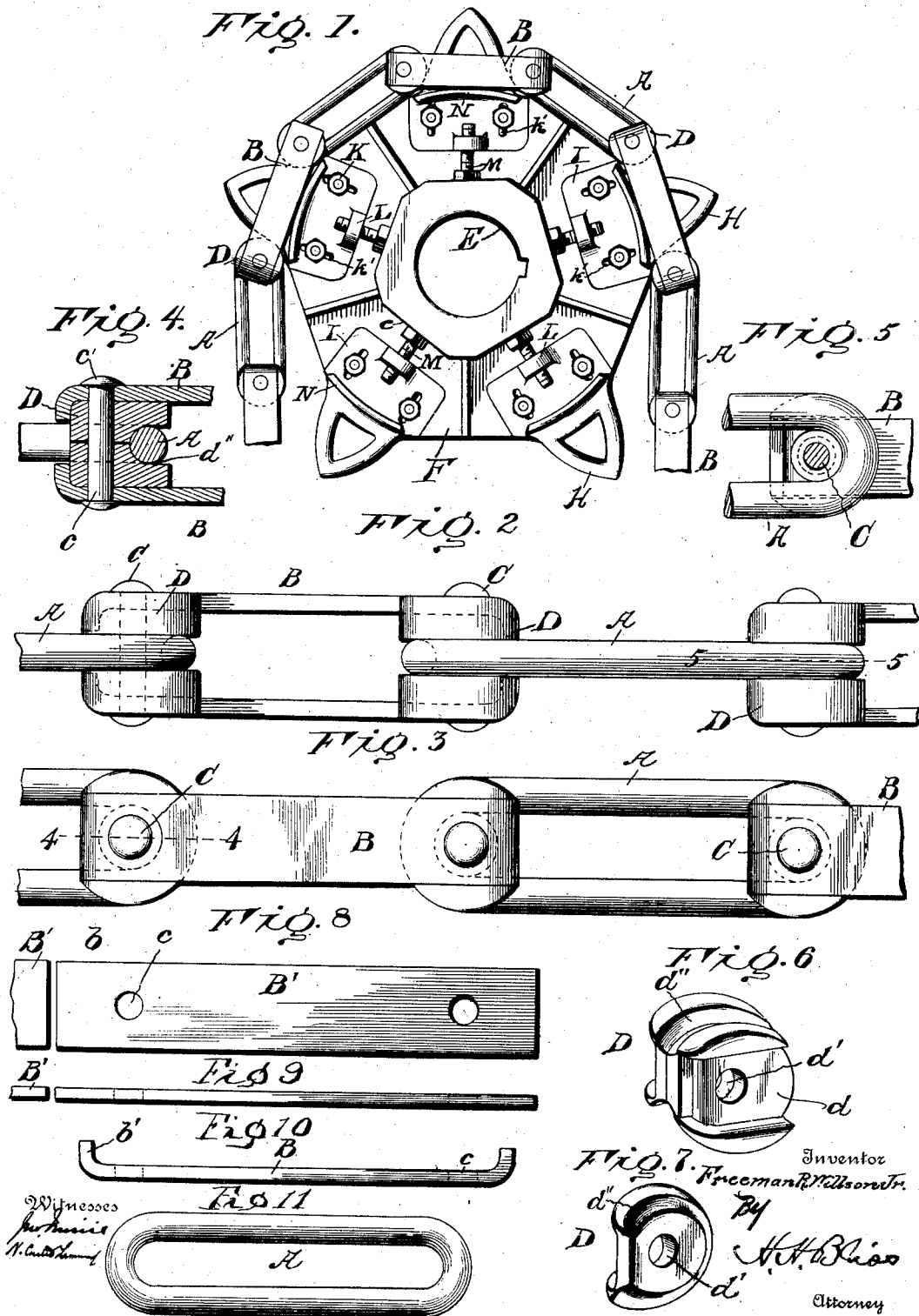
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PATENTED AUG. 18, 1903.

F. R. WILLSON, JR.
CHAIN.

APPLICATION FILED FEB. 20, 1901.

NO MODEL.



UNITED STATES PATENT OFFICE.

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CHAIN.

SPECIFICATION forming part of Letters Patent No. 736,904, dated August 18, 1903.

Application filed February 20, 1901. Serial No. 43,141. (No model.)

To all whom it may concern:

Be it known that I, FREEMAN R. WILLSON, Jr., 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 Chains, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to power-transmitting devices; and it consists particularly of improvements in a power-transmitting or drive chain adapted to engage with the teeth of a sprocket-wheel and in which use is made of wrought bar-links of the kind usually employed in cable-chains.

In the accompanying drawings, Figure 1 is a side view of a sprocket-wheel and a section of drive-chain engaging therewith embodying my improvements. Fig. 2 is a top plan view, enlarged, of the chain. Fig. 3 is a side or edge view of the chain. Fig. 4 is a horizontal sectional view taken on the line 4 4 of Fig. 3. Fig. 5 is a vertical sectional view taken on the line 5 5 of Fig. 2. Fig. 6 is a perspective view of one of the wearing blocks or pieces detached. Fig. 7 is a perspective view of one of the parts of the wearing-block shown in Fig. 6. Fig. 8 shows in side elevation a bar of metal to be formed into one of the flat links. Fig. 9 is an edge view of the same. Fig. 10 shows a bar in finished form. Fig. 11 is a plan view of one of the wrought or round bars.

In the drawings, A represents a wrought metal link, preferably of substantially elliptical form and formed of a bar round in cross-section and welded into a continuous piece. Links of this well-known form possess great strength, and for that reason it is desirable to use them in the formation of drive or power-transmitting chains. It is, however, difficult to construct a chain embodying links of this character which possesses the features which characterize a successful drive-chain.

It is one of the objects of my invention to so construct the coupling or intermediate links which alternate with the wrought links A and unite them as to form a drive-chain which shall possess great strength, be of sim-

ple construction, and be adapted to a great variety of uses. The intermediate or coupling links are formed of side bars B, wearing-blocks situated between the side bars and at the ends thereof, with which the wrought links A engage, and connecting-pins C, which unite the opposite side bars and the wearing blocks or pieces D. I prefer that the side bars B should be formed of flat bar metal.

In Fig. 8 the steps followed in the formation of the side bars are illustrated. A strip or bar of metal B' of suitable size in cross dimensions and of a length sufficient to make a number of side bars B is presented to a suitable cutting and punching machine, which severs the bar, as represented at b, forming pieces of proper length and at the same time punches the holes c for the passage of the bolts C. These pieces are next formed by suitable dies or presses into the shape represented in the lower part of Fig. 8, the ends of the bar being bent inward, as represented at b'.

I prefer that the wearing-block should be formed of cast metal. It is situated between the end portions of the opposite side bars B and has its opposite side channeled, as represented at d, to receive the ends of the opposite side bars B. It is perforated at d', and when the side bars and wearing-block are properly assembled the apertures c in the former register with the aperture d' in the wearing-block and permits the bolt or connecting-pin C to pass through and unite these parts. The pin is formed at one end with a head c', and I prefer that the opposite end should be upset or headed when the parts are assembled, so that it becomes a rivet permanently uniting the parts in the manner represented in Fig. 4. It will be understood that other means for securing the bolt or pin C in position to unite the side bars and the wearing-block might be used in lieu of the method described; but I prefer that the parts should be riveted together as illustrated and set forth.

The wearing piece or block is provided at its center or middle portion with a curved groove d'', in which lies the end of one of the wrought links A.

I prefer that the wearing piece or block D should be formed of two parts, as represented in Figs. 4, 6, and 7; but it will be understood that it might be made of a single and integral piece of metal, if desired.

It will be seen that while the coupling or intermediate link is formed of several pieces, which are each exceedingly simple in construction when its elements are assembled, there is formed a structure possessing practically the strength and rigidity of an integral element.

The channels or recesses d formed in the sides of the wearing-blocks are of such shape and depth that the ends of the side bars are practically flush with the side faces of the wearing-blocks when the parts are assembled. The engagement of the curved ends b' of the side bars with the wearing-blocks and of the shoulders of the wearing-blocks on either side of the channels d with the edges of the side bars prevents any looseness or movement of the parts relative to each other even should the connecting-pins become worn or loose.

By reference to Figs. 1 and 2 it will be seen that the openings for the sprocket-teeth are formed in the intermediate or connecting links, that these openings are substantially rectangular in shape, and that the sprocket-teeth engage with the wearing-blocks D and do not contact with the wrought links A at all. This leaves the links perfectly free to articulate in the plane of the wheel. The construction of the chain is such that it is rigid or stiff to a very considerable degree in a plane transverse to the plane of the sprocket-wheels.

While a chain such as I have shown and described may be used in connection with many different forms of sprocket-wheels having solid teeth, I prefer to use in connection therewith the form of sprocket-wheel F illustrated in Fig. 1 and having the teeth adjustable radially. Inasmuch as the novel features of construction incident to this wheel are to be claimed in another application, it is not necessary to describe it here in detail, it being sufficient to note that it is formed with a hub E, teeth H, each carried by a plate I, which can be adjusted by a bolt M, bearing against a hub and engaged with a lug on the plate, and each plate being fastened after adjustment by bolts at K in slots k' . Each plate has a flange at N for receiving the chain-links.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with the wrought links A, of a connecting or intermediate link formed of separate side bars, wearing-blocks for the wrought links arranged between the ends of the side bars, and connecting-bolts each passing through the opposite side bars and a wearing-block and uniting them, substantially as set forth.

2. The combination with the wrought metal

links A, of a coupling or connecting link formed of separate side bars adapted to receive between them the teeth of a sprocket-wheel, wearing-blocks arranged between the ends of the side bars, with which the wrought links engage and with which the sprocket-teeth are also adapted to engage, and connecting pins or bolts which pass through the side bars and the wearing-blocks and unite them, substantially as set forth.

3. The combination with the wrought links A, of a coupling or connecting link comprising opposite side bars, wearing-pieces with which the wrought links engage arranged between the ends of the side bars and having interlocking engagement therewith, whereby the side bars and wearing-blocks are held in rigid relation to each other, and connecting-bolts which pass through the opposite side bars and unite them, substantially as set forth.

4. The combination with the wrought links, of a coupling or connecting link which unites them consisting of separate side bars, the wearing-pieces formed with channels in their outer faces in which the ends of the side bars are adapted to rest, and with grooves in which the wrought links lie, and cross-connecting bolts arranged to pass through the side bars and the wearing-pieces and unite them, substantially as set forth.

5. The combination with the wrought links A, of the coupling or connecting link formed of the flat side bars, B, B, having the bent ends b' , the wearing-pieces arranged between the ends of the side bars and having channels d in which the ends of the side bars are seated, and grooves d'' for the wrought links, and the connecting pins or bolts C which pass through the side bars and the wearing-pieces and unite them, substantially as set forth.

6. The combination with the wrought links, of the intermediate or coupling link having the side bars, the wearing-pieces D for the wrought links each formed of two parts, and the connecting bolts or pins which pass through the side bars and the wearing-blocks and unite them, substantially as set forth.

7. A power-transmitting chain comprising a series of wrought links arranged in the central axial plane of the chain, a series of intermediate coupling-links arranged between the wrought links and uniting them, wearing-blocks with which the wrought links have articulate engagement and means for rigidly connecting the blocks with the intermediate links whereby longitudinal movement of the blocks relative to the intermediate links is prevented, substantially as set forth.

8. A power-transmitting chain comprising a series of wrought links intermediate links connecting the wrought links having separate side bars, wearing-blocks arranged between the side bars of the intermediate links with which the wrought links have articulate engagement and means for uniting the opposite side bars and for holding the wearing-

blocks rigidly relative thereto, substantially as set forth.

9. A chain comprised of alternately-arranged round bar-links and intermediate
5 links having opposite side bars formed of flat bar metal and means arranged between the side bars of such intermediate links for properly spacing them and also for serving as

wearing-pieces for the round bar-links, substantially as set forth.

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

FREEMAN R. WILLSON, JR.

Witnesses:

G. C. HORST,

N. C. KINGSBURY.