No. 736,906. PATENTED AUG. 18, 1903.

F. R. WILLSON, Jr.

SPROCKET WHEEL.

APPLICATION FILED MAY 20, 1903.

NO MODEL.

Fig. 1.

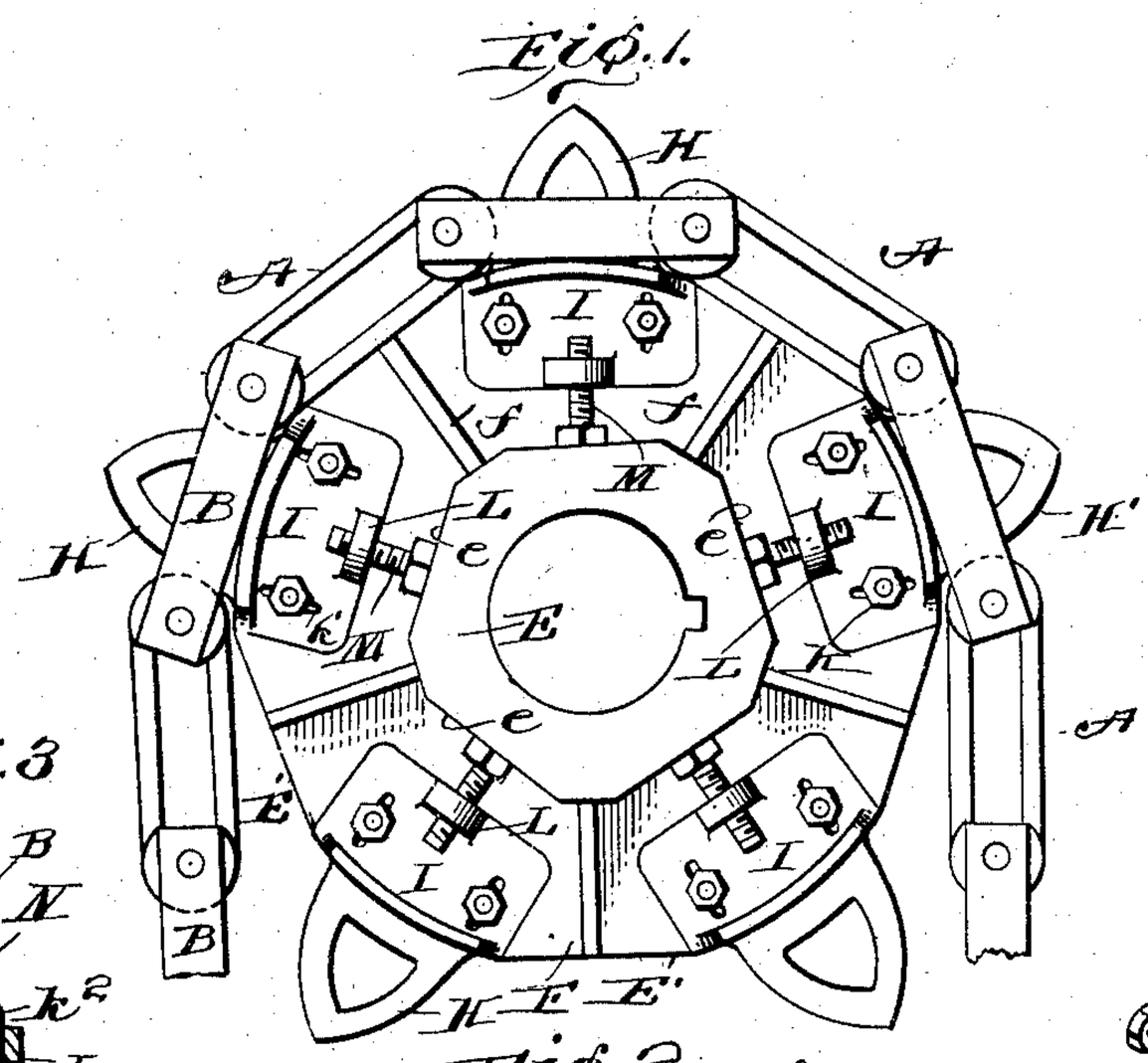


Fig. 3

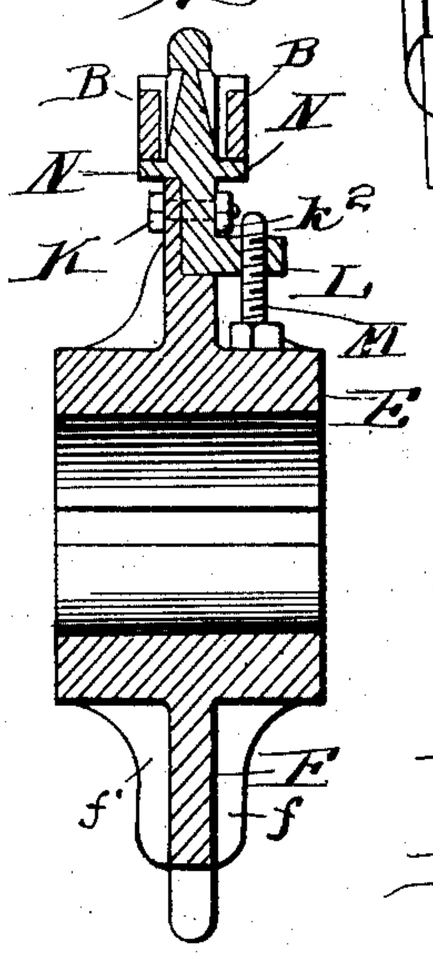


Fig. 4

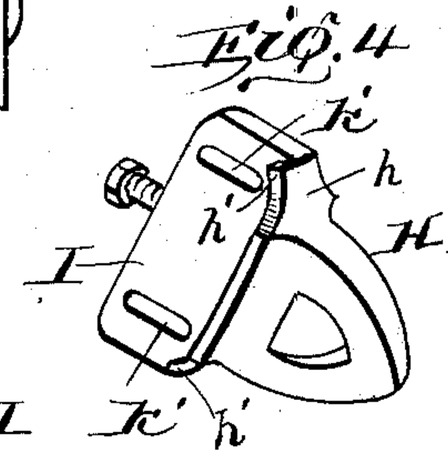


Fig. 2

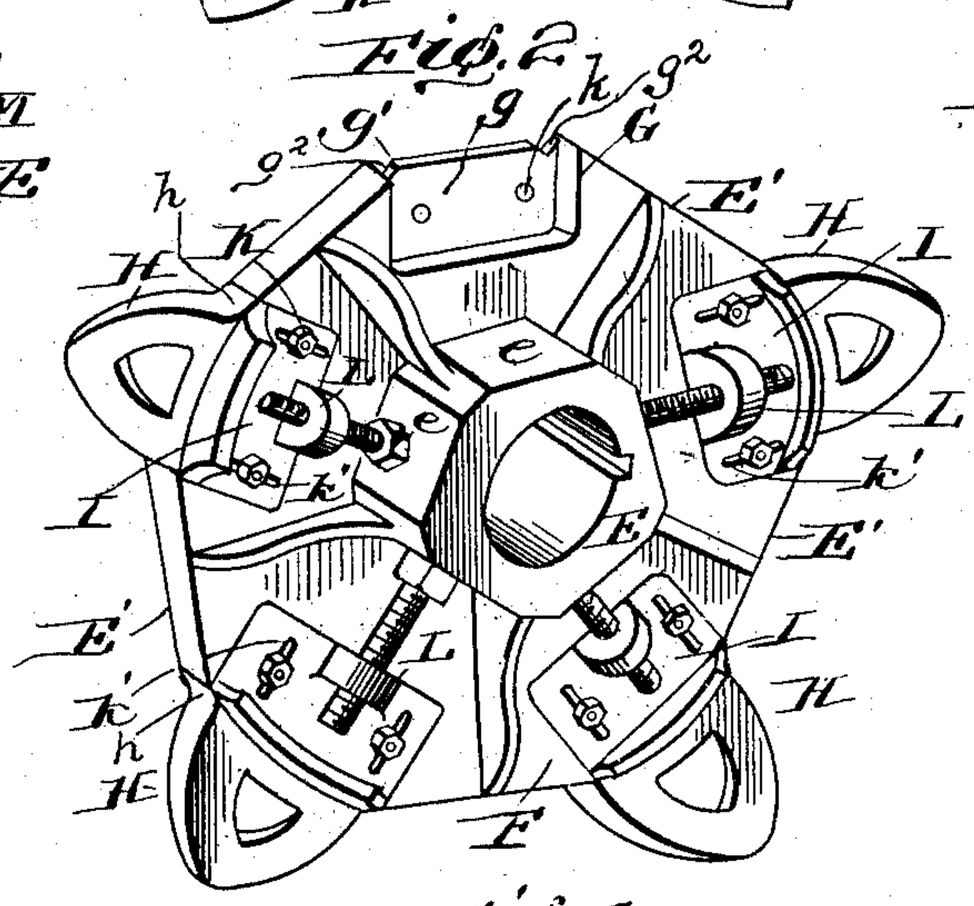
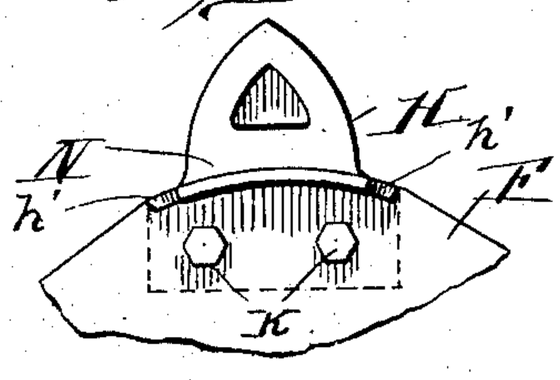


Fig. 5.



Witnesses
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No. 736,906. Patented August 18, 1903.

UNITED STATES PATENT OFFICE.

FREEMAN R. WILLSON, JR., OF WORTHINGTON, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOSEPH A. JEFFREY, OF COLUMBUS, OHIO.

SPROCKET-WHEEL.

SPECIFICATION forming part of Letters Patent No. 736,906, dated August 18, 1903.

Original application filed February 20, 1901, Serial No. 48,141. Divided and this application filed May 20, 1903. Serial No. 157,985. (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 Worthington, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Sprocket-Wheels, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in sprocket-wheels for drive-chains, and particularly to sprocket-wheels of the sort used with cable-chains—that is to say, chains made up of two sets of links, those of one set alternating with those of the other and those of one set lying in planes at right angles to those of the other set; and the object of the invention is to so construct the parts of a sprocket-wheel for such chains and so relate them to the links that the pitch of the teeth can be adjusted to meet variations in pitch in the chain-links. It is well known that difficulty is experienced in using cable-chains as elements in sprocket-gearing, because of the universal-joint-like articulating connections for the links, there resulting from this more or less twisting or torsion of the links on each other with a commensurate tendency for them to not fit properly to the wheel-teeth, and these difficulties have been experienced particularly when the attempt has been made to have the sprocket-teeth of the wheel adjustable, and the purpose of the present invention is to overcome this.

This application is a division of my application, Serial No. 48,141, filed February 20, 1901, for a chain.

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 perspective view of the sprocket-wheel, one of the teeth being removed. Fig. 3 is a vertical sectional view of the sprocket-wheel. Fig. 4 is a perspective view of one of the sprocket-teeth detached. Fig. 5 is a side view of a small section of the wheel shown in Fig. 2 as seen when viewed from the side opposite to that represented in said figure.

In the drawings I have shown a chain and a wheel whose parts are so constructed and related as to embody my improvements.

The hub portion of the wheel is indicated by E, F being the main web thereof transverse to the axis. This web is in the center of the hub.

The tooth-sections are shown at H I, the former indicating the link-engaging part.

A B indicate the links of a chain of the "cable" class adapted to be used with a wheel of this sort. Each link A extends from the root of one tooth to the root of the next, these links A alternating with those at B. The plane of each link A when it is engaging with the wheel is the central transverse plane of the web F. The latter is formed with rectilineal peripheral sections E′, and these are adapted to form seats or bearings for the inner side bars on these links A.

The alternating links B lie in planes at right angles to those at A, and each of them has a central opening adapted to receive one of the teeth H. By having the teeth and the links related in the way described, with the alternating links A extending from tooth to tooth, there is assurance that each link B will be brought into such position that its aperture shall receive the next tooth H.

The radial thrust from the links A is taken by the oppositely-disposed bracing-webs *f f′*, which extend from the main web F, one toward the right and the other toward the left and both integral with the web and with the hub.

Each of the alternating or tooth-engaging links B B extend from the bottom of the tooth on one side to the bottom of the other side of the same tooth.

The tooth-section, as aforesaid, is made up of the link-engaging part H and the base-plate I. In the periphery of the web F there are formed sockets G, each socket having a wall *g* back of it at its lower part, but the metal being removed entirely at the upper edge, as shown at *g′*. The tooth-plate I is fitted in this socket, and the latter and the plate are so formed as that when the teeth are in position the central transverse plane of the tooth and of the plate coincides with

the transverse plane of the main web F. In this way the strain of the tooth is imparted to the wheel at its central plane and great strength is insured without the necessity of thickening the metal or forming abutment-webs along the face. The plate I is of greater width than the tooth proper, providing an ample basis of attachment and support. It is held in place by two independent sets of fastening devices, one near one edge and the other near the other, these comprising bolts K, passing through apertures *k* in the wall *g* and provided with nuts k^2. The bolts pass through parallel slots *k'*. By having these two independent sets of clamping devices I can insure that the tooth shall be firmly fastened in the desired position of adjustment and prevented from yielding forward or backward, as is the case where a single clamping device is used, inasmuch as the sockets and webs cannot be always fitted with the utmost accuracy.

N N' are flanges at the base of each tooth and projecting outward therefrom in the opposite directions. They serve as supports for the side bars B of the tooth-engaging links of the chain. The flange N' is fitted in the part *g'* of the socket or slot in the web F. This enables the teeth to be adjusted inward to such position as to have the flanges N N' entirely below the lines of the sections E'.

L represents an offset or lug extending laterally from the outer face of the plate I of the adjustable tooth. It is perforated and screw-threaded and has mounted therein an adjusting-screw M. The head of this screw bears upon a flat face *e* of the hub.

It will be readily understood that the teeth of the sprocket-wheel may be adjusted to suit the pitch of the chain by loosening the nuts upon the bolts K and turning the adjusting-screw M until the teeth occupy the proper position, after which the nuts upon the bolts K will be set tight to hold the teeth in the proper position.

The teeth H are provided at their roots with the relatively wide portions *h*, which serve as bearing-surfaces for the end bars of the chain-links. These portions *h* project out over the plate I upon the side which lies next to the back wall *g* of the sockets G, as shown at *h'*. Notches g^2 are provided in the top of the back wall *g* to receive these projections *h'* when the tooth is inserted in the socket. A bearing-surface of constant width is thus obtained for the end bars of the chain irrespective of the position to which the tooth is adjusted.

What I claim is—

1. The combination with the wheel having the main web F formed with rectilineal peripheral surfaces E', and the adjustable teeth, of the chain having links A each when engaging with the wheel, extending from the root of one tooth to the root of the next and having its side bars both in the plane of the web F and bearing against a rectilineal peripheral section E', and the alternate links B, each, when engaging with the wheel, extending from the bottom of a tooth on one side to the bottom of said tooth on the other side, each of said teeth being adjustable and formed with link-supporting flanges N, N', one on each side, and having a base part which is wider than the tooth and is provided with two independent sets of fastening devices, and said wheel having on each side of the web oppositely-arranged bracing-webs *f*, *f'* integral with the hub and with the web F, substantially as set forth.

2. The combination with the wheel having a transverse web formed with a series of sockets G and with the rectilineal peripheral surfaces E', of the separately-formed teeth, each having the tooth part H proper, and the fastening-plate I of a width greater than the width of its tooth and formed with the parallel slots *k'* and the bolts K in said slots whereby each side of the tooth-plate can be clamped independently of the other, the wheel having a hub extending longitudinally of the axis in both directions from the said web, and the bracing-webs *f'* between the transverse web and one end of the hub and the bracing-webs *f* between the transverse web and the other end part of the hub, substantially as set forth.

3. In a sprocket-wheel, the combination of the hub, the web thereon provided with sockets, the sprocket-teeth having the plates I adapted to fit into the said sockets and the relatively wide bearing-surfaces at their roots, said bearing-surfaces projecting beyond the said plates and having their projecting ends seated in notches provided in the said web, and means for adjusting the teeth, substantially as set forth.

4. In a sprocket-wheel, the combination of the hub, the web thereon having the sockets G provided with the back walls *g* having the sockets g^2 therein, the sprocket-teeth having the plates I adapted to fit into the said sockets and the relatively wide bearing-surfaces at their roots, said bearing-surfaces projecting beyond the said plates and having their projecting ends seated in the sockets g^2, and means for adjusting the teeth, substantially as set forth.

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

FREEMAN R. WILLSON, JR.

Witnesses:

J. MCDONALD,

JOE WEBSTER.