J. M. DODGE.

DRIVE CHAIN.

APPLICATION FILED MAR. 9, 1910.

958,677.

Patented May 17, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

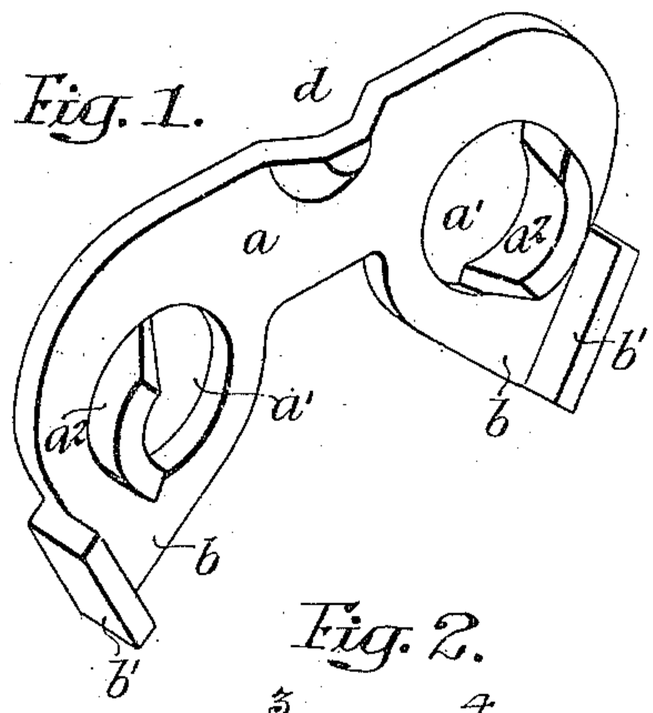


Fig. 3.

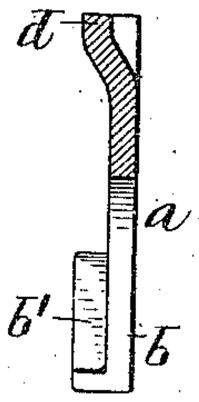


Fig. 2.

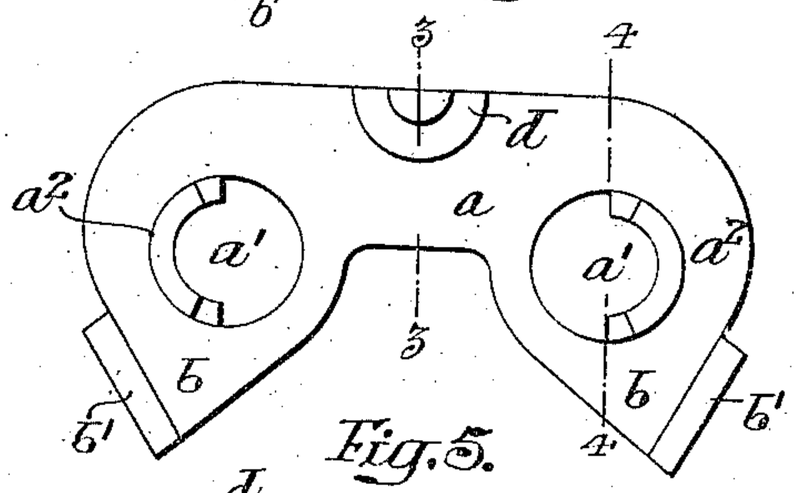


Fig. 4.

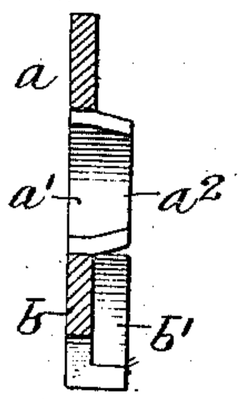


Fig. 5.

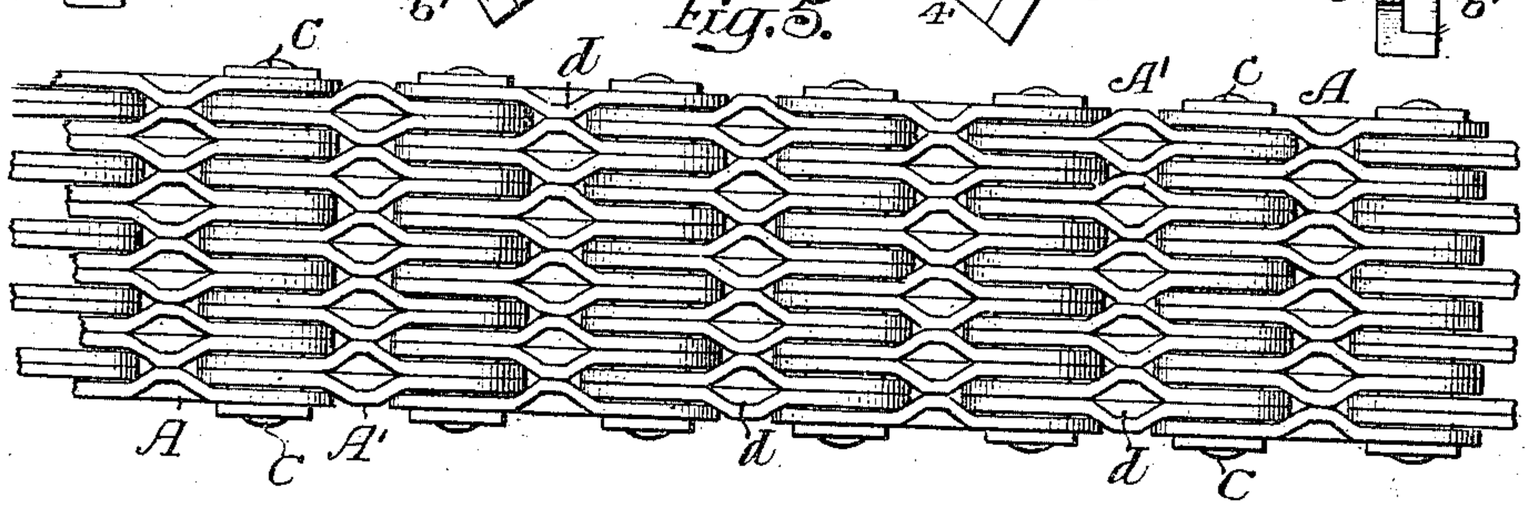


Fig. 6.

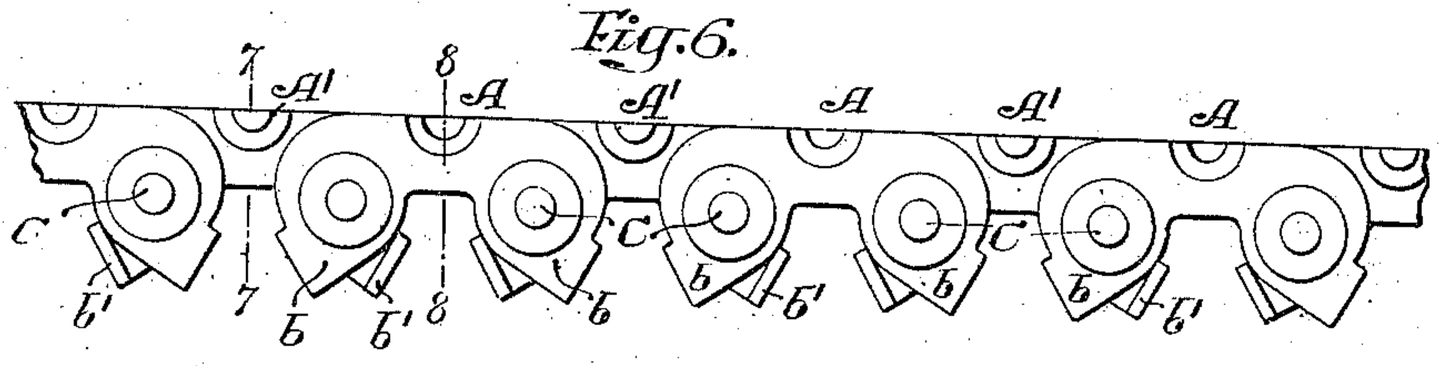
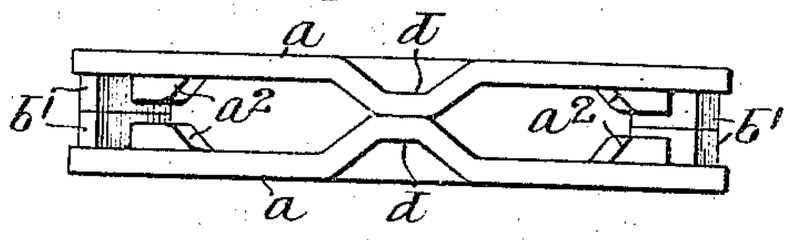


Fig. 16.



Witnesses.

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Howson & Howson.

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2 SHEETS—SHEET 2.

Fig. 12.

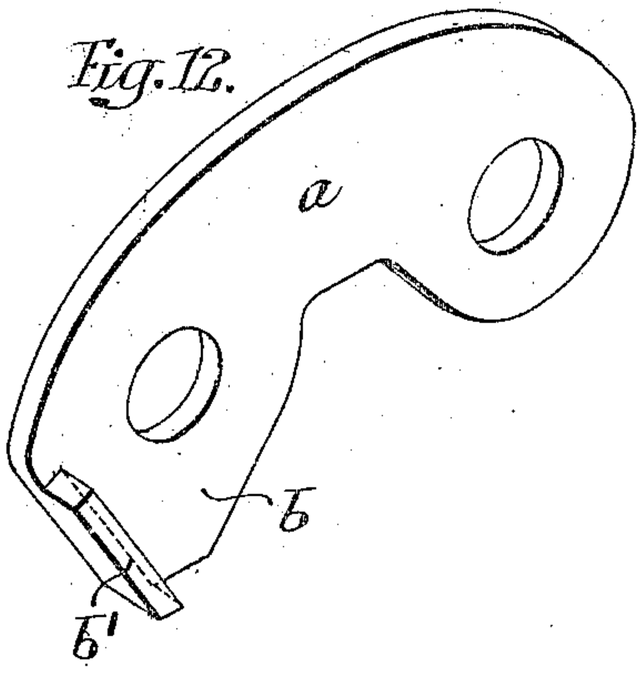


Fig. 15.

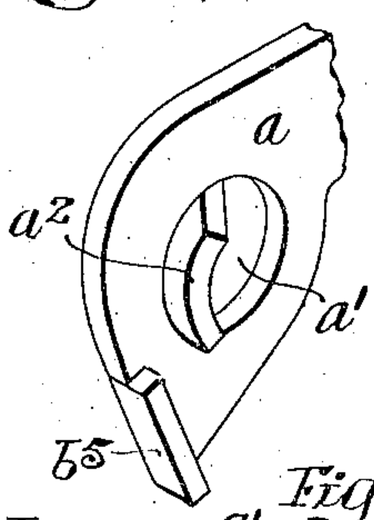


Fig. 14.

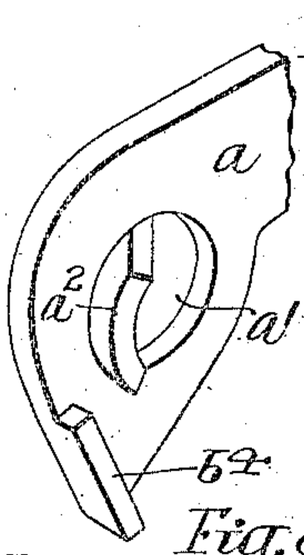


Fig. 7.

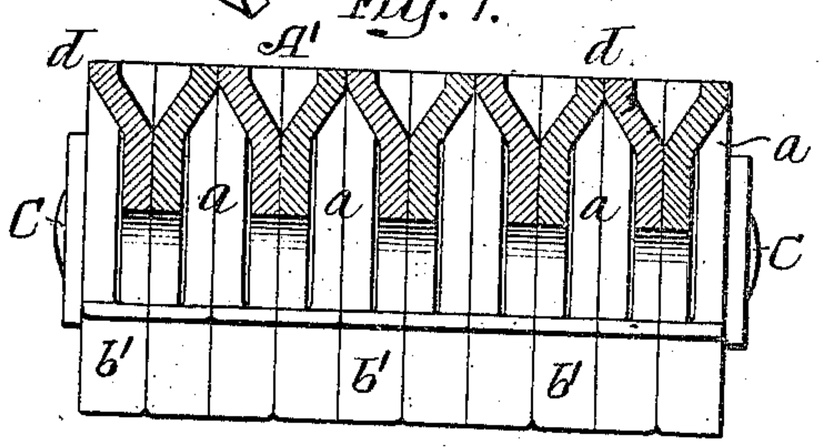


Fig. 8.

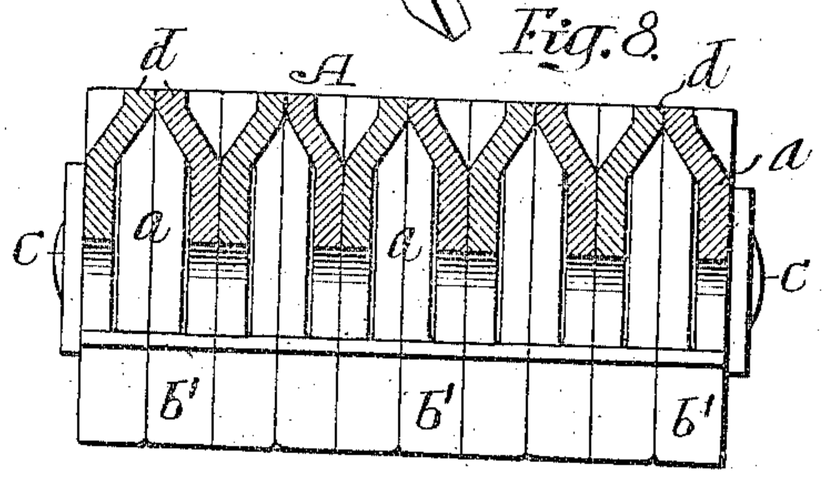


Fig. 10.

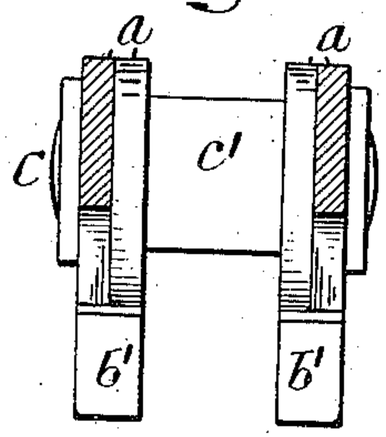


Fig. 11.

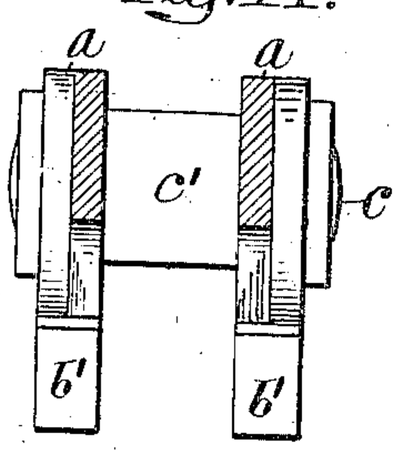


Fig. 9.

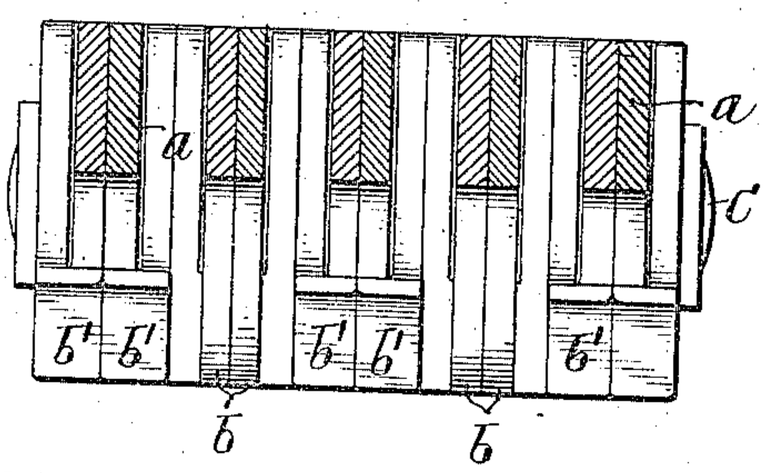
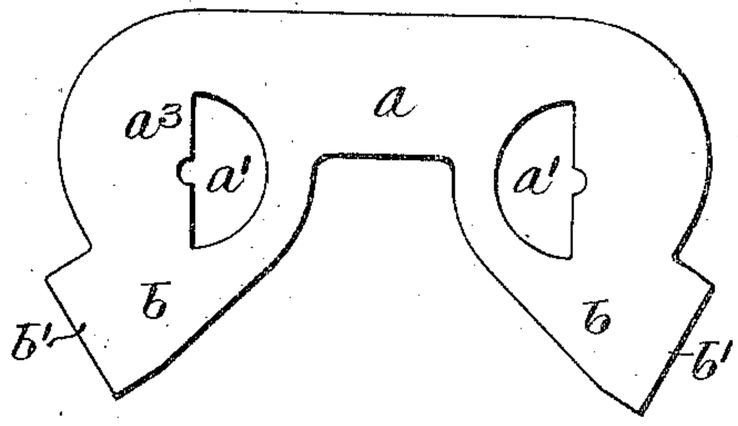


Fig. 13.



Witnesses.—
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Inventor.—
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by his Attorneys.—
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UNITED STATES PATENT OFFICE.

JAMES M. DODGE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO LINK-BELT COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DRIVE-CHAIN.

958,677. Specification of Letters Patent. Patented May 17, 1910.

Application filed March 9, 1910. Serial No. 548,179.

To all whom it may concern:

Be it known that I, JAMES M. DODGE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Drive-Chains, of which the following is a specification.

My invention relates to certain improvements in drive chains having teeth which engage the teeth of sprocket wheels. In this type of chain each link is usually made up of a series of plates; the plates in most cases being made from sheet metal and are preferably arranged in pairs, as shown, one pair of plates of one link alternating with a pair of plates of a link to which it is coupled.

The object of my invention is to provide the working faces of the teeth with extended bearings.

In the accompanying drawings:—Figure 1, is a perspective view of one of the plates of the link illustrating my invention; Fig. 2, is a side view; Fig. 3, is a sectional view on the line 3—3, Fig. 2; Fig. 4, is a sectional view on the line 4—4, Fig. 2; Fig. 5, is a plan view of a chain embodying my invention; Fig. 6, is a side view of the chain illustrated in Fig. 5; Fig. 7, is an enlarged transverse sectional view on the line 7—7, Fig. 6; Fig. 8, is an enlarged transverse sectional view on the line 8—8, Fig. 6; Fig. 9, is a view illustrating one method of arranging the plates of a link; Figs. 10 and 11, are sectional views illustrating my invention used in connection with the type of chain where each link is made up of two plates spaced apart; Fig. 12, is a perspective view of a modified form of plate; Fig. 13, is a side view of the plate blank; Figs. 14 and 15, are views illustrating modifications of the method of forming the extended bearings; and Fig. 16, is a plan view showing two plates arranged side by side.

The chain is composed of a series of links A and A′, connected together in the present instance by pivot pins C, and each link consists of a series of plates *a* and each of these plates has two pivot pin openings *a′* and two teeth *b*, as clearly shown in Fig. 1. Projecting laterally from one side of the plate at the working face of the teeth are extended bearings *b′* which, when the plates are assembled as illustrated in Fig. 5, aline with the bearings on the other plates, forming a continuous bearing from one side of the chain to the other, as illustrated in Figs. 7 and 8.

d is a lateral projection, in the present instance formed by pressing the plate at the upper edge, as shown in Fig. 1. The extended bearing *b′* at the teeth and the projection *d*, and preferably the extended bearings a^2 at the pivots, project a sufficient distance so that when the plates are assembled the projections on one plate contact with the projections on the adjoining plate, as shown in Fig. 16, spacing the plates apart so that the plates to which they are coupled fit freely between the first mentioned plates and thus side friction is materially reduced.

The plate illustrated in Figs. 1 to 4, is made in the present instance of comparatively thin sheet metal and shaped by suitable dies, and the laterally projecting portions a^2 and *b′* are formed by bending the metal from the blank at right angles to the longitudinal line of the plate.

The blank is made as shown in Fig. 13, the projecting portions of the blank forming, when bent, lateral extended bearings *b′* at the teeth, while the pivot pin opening is only partially formed in the blank; the portion a^3 of the blank remaining uncut and this portion is forced from the blank by suitable dies, forming the extended bearings a^2 at the pivot pin openings. The link may, however, be made by drop forging or casting, if necessary, and, in making chains having large plate sections, it may be advisable to drop forge these plates rather than to stamp them from a sheet. It will be understood, with reference to Fig. 1, that the lateral extended bearings at the teeth project on one side only of the plate. The object of this construction is to allow plates to be assembled in pairs, as shown in Figs. 5, 7 and 8. Each pair of plates being so arranged that the plates are fitted back to back with the extension projecting on the free side and these plates can be connected together by welding or riveting, as illustrated and claimed in the application for patent filed by me on December 7th, 1909, under Serial Number 531,799.

The outside plates of the links A are single plates and their extended bearings preferably project inward so that when sev-

eral plates are assembled, as in Fig. 8, a continuous bearing is formed extending from one side of the link to the other.

In some instances in wide chains the bearing need not be continuous and only a portion of the plates forming the link may have the extended bearings, the other plates being flat and without extended bearings, as illustrated in Fig. 9. The bearing, however, will be of a greater area than the links of a chain of this type as ordinarily constructed.

In Figs. 10 and 11, I have shown a chain in which the links are each made up of a pair of plates, the plates being spaced apart by sleeves c' which surround the pivots c. In this type of chain I preferably form the outside links with inwardly projecting extended bearings, as shown in Fig. 10 and the inside links with outwardly projecting bearings, as shown in Fig. 11.

In Fig. 12, I have illustrated my invention applied to a plate having only one tooth, and it will be understood that the invention can be applied to a plain plate in which the extended bearings at the pivot and the lateral projection d are dispensed with, and if the tooth has a working face on each side then the extended bearings may be on each edge of each tooth.

In Fig. 14, I have shown the extended bearing formed by a plate b^4 secured to one side of the link by welding, and in Fig. 15, I have shown a modification in which the bearing surface of the tooth is notched to receive the bearing plate b^5, which has a broader surface than the bearing face of the tooth, and this bearing plate may be made of hard metal.

In Fig. 16, I have shown two plates of a link placed side by side with the extended bearings b' at each tooth abutting, and in this instance I also show the projections d abutting so that there are three points of contact holding the plates a given distance apart and forming a rigid support against any lateral bending of the plates. In this particular instance the extended bearings at the pivots do not come in contact with each other, the contact being solely between the extended bearings at the teeth and the central projection, although all the bearings may come in contact, or only those at the teeth, without departing from the essential features of the invention.

The central projection d may be made in any manner desired, or may be dispensed with entirely in some instances as in Fig. 12. This is true where a plate is of sufficient thickness to resist any lateral strains, but where thin plates are used I preferably form the intermediate projection so as to stiffen the plates.

In a pending application filed by Harold S. Pierce, June 9th, 1909, under Serial Number 501,054, the extended bearing at the teeth of the links is set forth and broadly claimed, and, therefore, the present invention relates to the forming of the extended bearing on one side of the plate only, and forming the bearing by bending the metal of the plate at an angle to the body thereof.

I claim:—

1. A chain link plate having perforations, teeth projecting at one edge of said plate and having laterally extended bearings, and a lateral projection at the other edge of said plate.

2. As a new article of manufacture, a chain link element consisting of a plate having a portion forming a sprocket-engaging tooth; said plate presenting a plane surface on one face and having on its other face a laterally extended bearing at the tooth.

3. As a new article of manufacture, a chain link element consisting of a plate having portions forming sprocket-engaging teeth; said plate presenting a plane surface on one face and having on its other face laterally extended bearings at the teeth.

4. As a new article of manufacture, a chain link element consisting of a plate having a portion forming a sprocket-engaging tooth; said tooth presenting a flat surface on one side and having on its other side a lateral projection forming an extended bearing adjacent to and in continuation of its working face.

5. As a new article of manufacture, a chain link element consisting of a plate having two angular projecting teeth extending from the same side thereof, one side of each of said teeth having a flat surface and the other side of each tooth having a lateral projection forming an extended bearing adjacent to and in continuation of its working face.

6. As a new article of manufacture, a chain link element consisting of a pair of plates each having a portion forming a sprocket-engaging tooth, each of said plates presenting a plane surface on one face and having said surfaces immediately adjacent to each other, the plates being provided with laterally extended bearings at the teeth, projecting in opposite directions.

7. The combination in a chain, of a series of links each consisting of a plurality of pairs of plates having teeth and laterally extended bearings at the working faces of said teeth, the plates of each pair having faces immediately adjacent to each other and the bearings of each pair projecting from the two outer faces thereof and lying in substantially the same plane.

8. A chain link element consisting of a pair of plates, each having a tooth and each provided with a bearing projecting adjacent the working face of the tooth at one side

thereof, said plates being held immediately adjacent to each other, with said bearings projecting in opposite directions.

9. A chain formed of a series of links each consisting of a plurality of pairs of plates, each plate having a tooth provided with a bearing projecting at one side thereof, with means for connecting the links and holding the plates of each pair immediately adjacent to each other with their bearings projecting in opposite directions.

10. A link plate made of sheet metal and having a tooth and an extended bearing projecting laterally from one side of the tooth; the fibers of the metal in the bearing lying in a plane substantially at right angles to the plane of the fibers of the metal in the tooth.

11. A link plate having two perforations and two angular teeth, said plate being provided with laterally extended bearings projecting on one side thereof at the perforations and also having an extended bearing projecting laterally from one side at the working face of each tooth, with a centrally disposed lateral projection on the same side of the plate as that having the extended bearings.

12. The combination in a drive chain of a series of links each composed of a number of toothed plates arranged in pairs; the plates of each pair having a plane surface on one side and laterally extended bearing projections at the teeth on the other side; said plates of each pair being arranged with their plane surfaces in juxtaposition and the pairs of plates of one link alternating with the pairs of plates of an adjoining link; with pivots coupling the links.

13. The combination in a drive chain of a series of links each composed of a number of toothed plates arranged in pairs; the plates of each pair having a plane surface on one side and laterally extended bearing projections at the teeth on the other side; there being pivot openings in each plate and laterally extended bearings at said openings projecting on the same side of the plate as the tooth bearing projections; said plates of each pair being arranged with their plane surfaces in juxtaposition and the pairs of plates of one link alternating with the pairs of plates of an adjoining link; with pivots coupling the various links.

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

JAMES M. DODGE.

Witnesses:
WM. E. SHUPE,
WM. A. BARR.