

C. W. LEVALLEY.  
Links for Drive-Chains.

No. 214,409.

Patented April 15, 1879.

Fig. 1

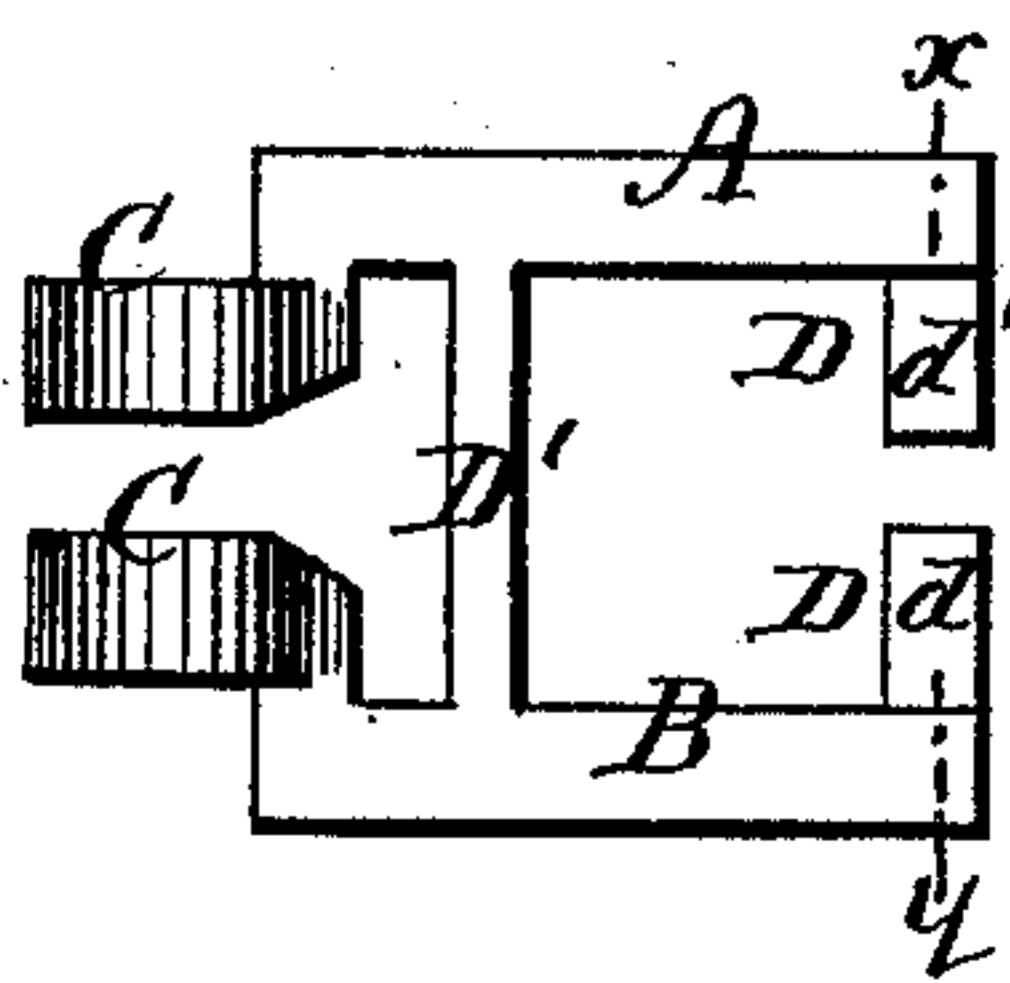


Fig. 2. Fig. 3.

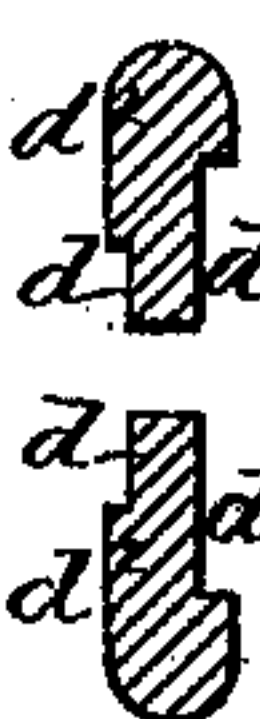
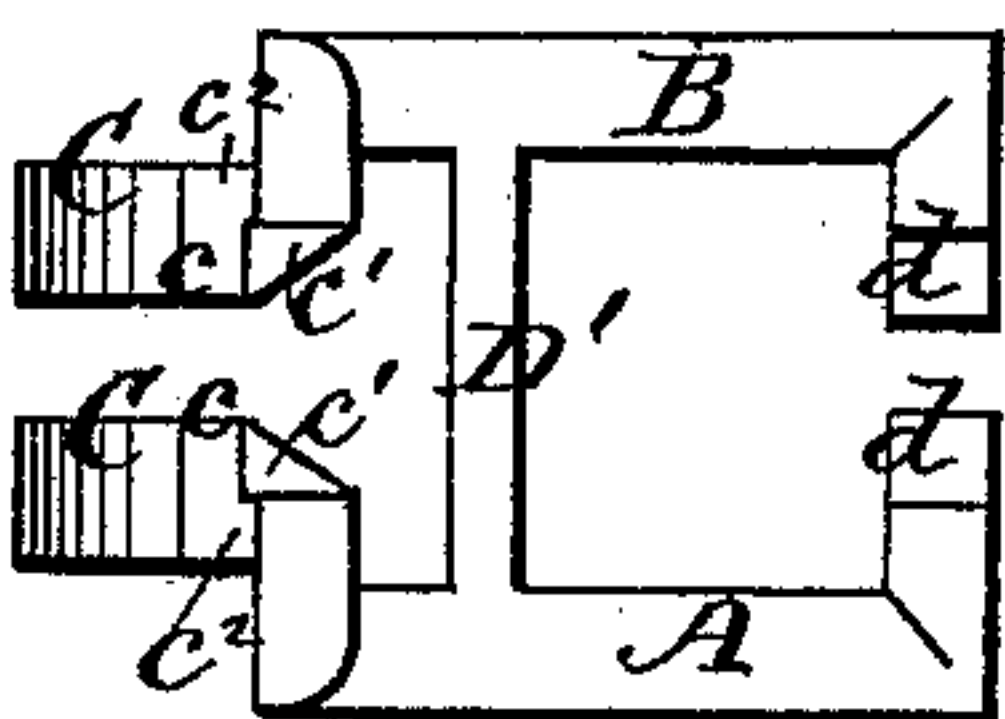


Fig. 4.

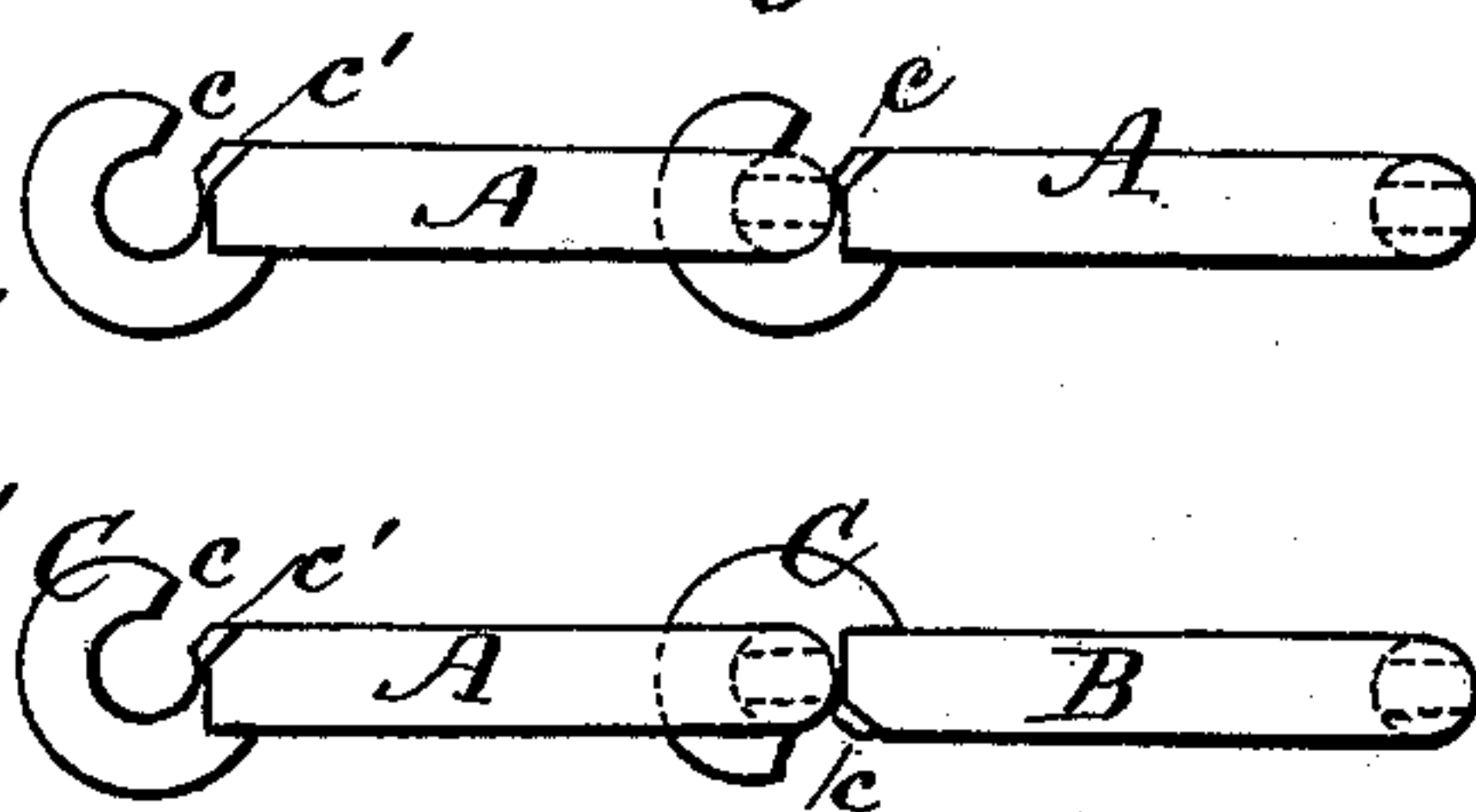


Fig. 7.

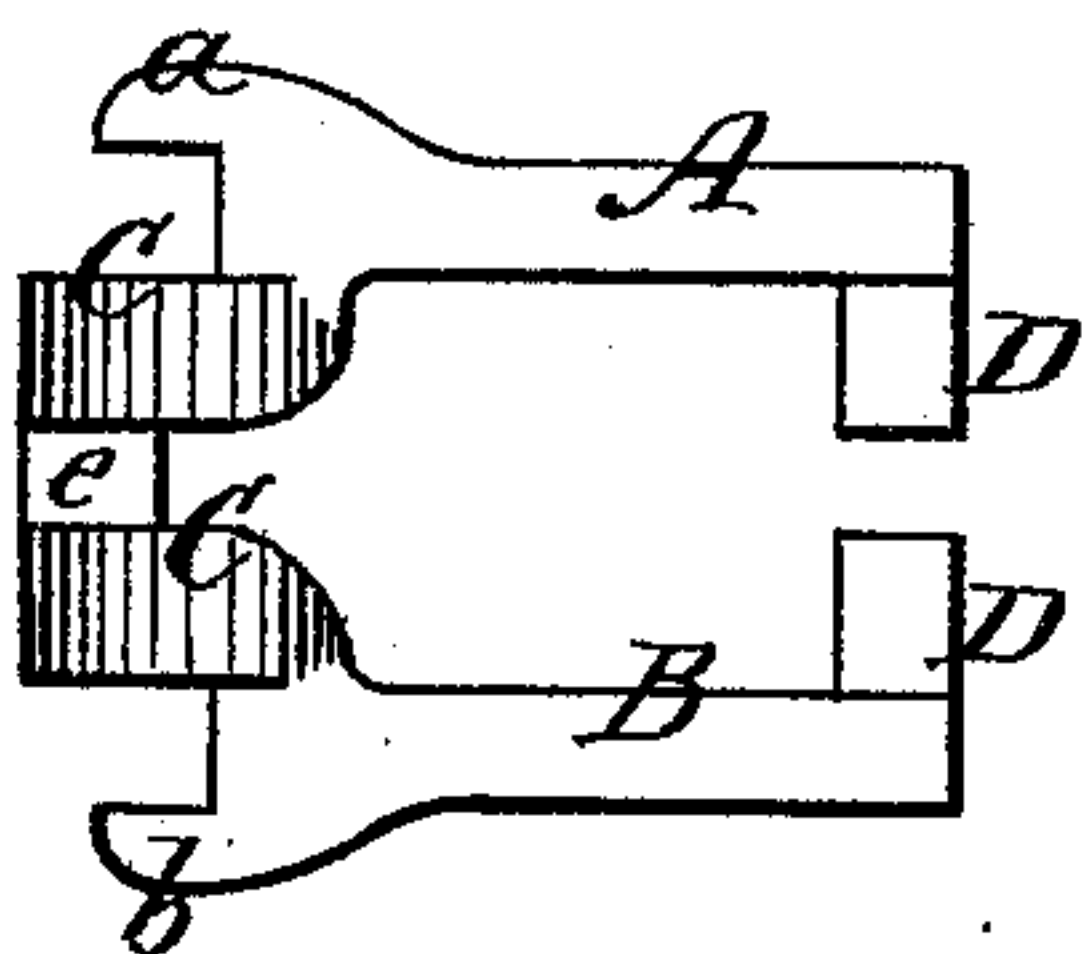


Fig. 8.

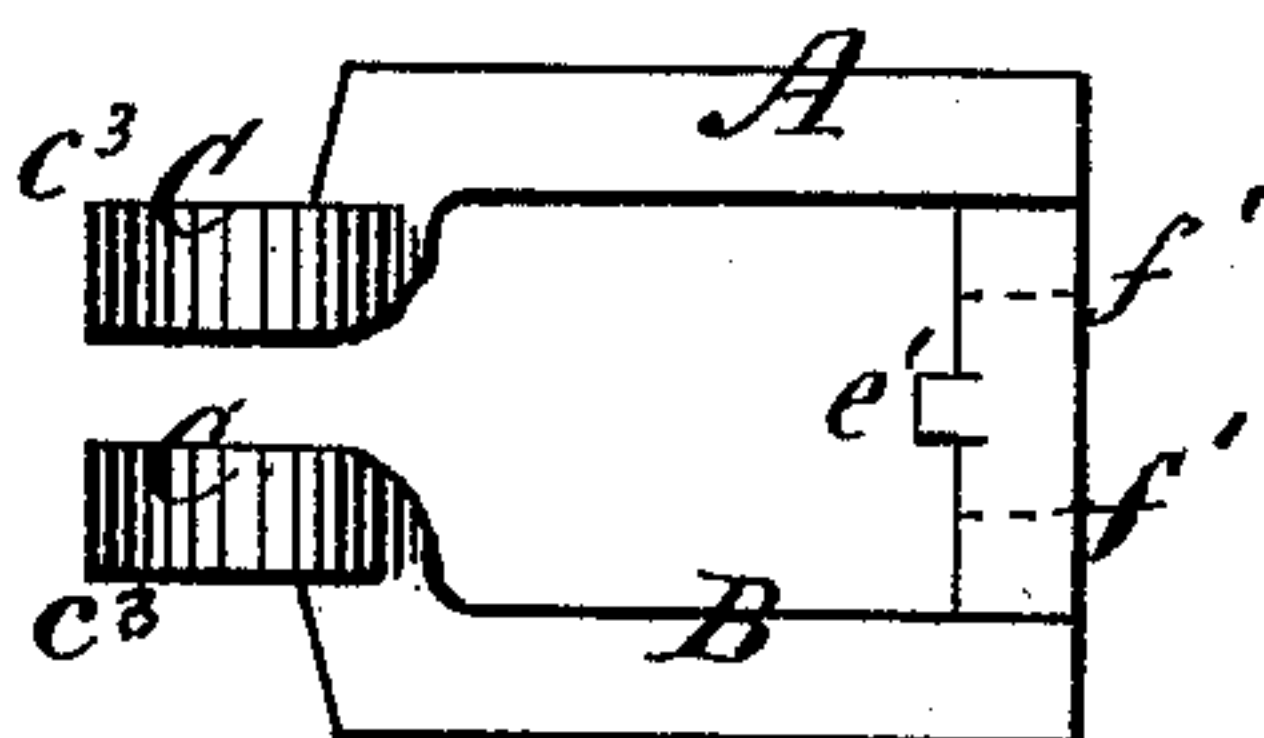


Fig. 5.

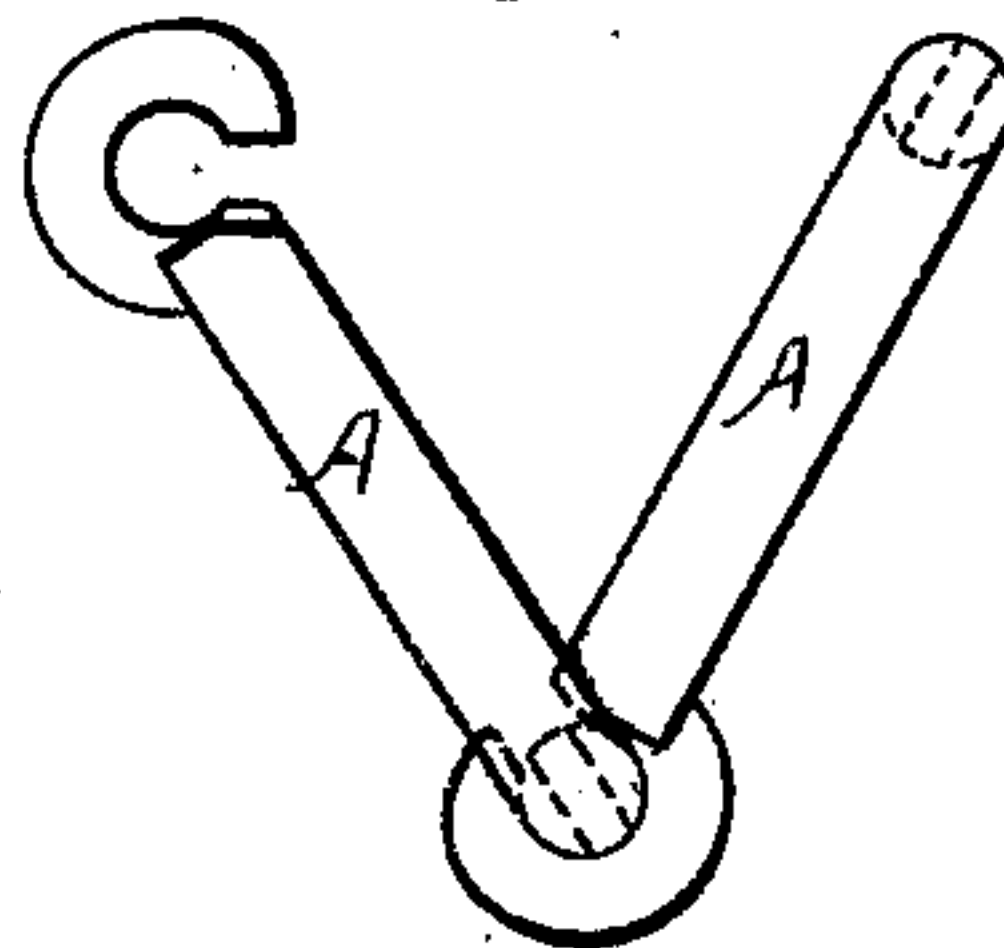
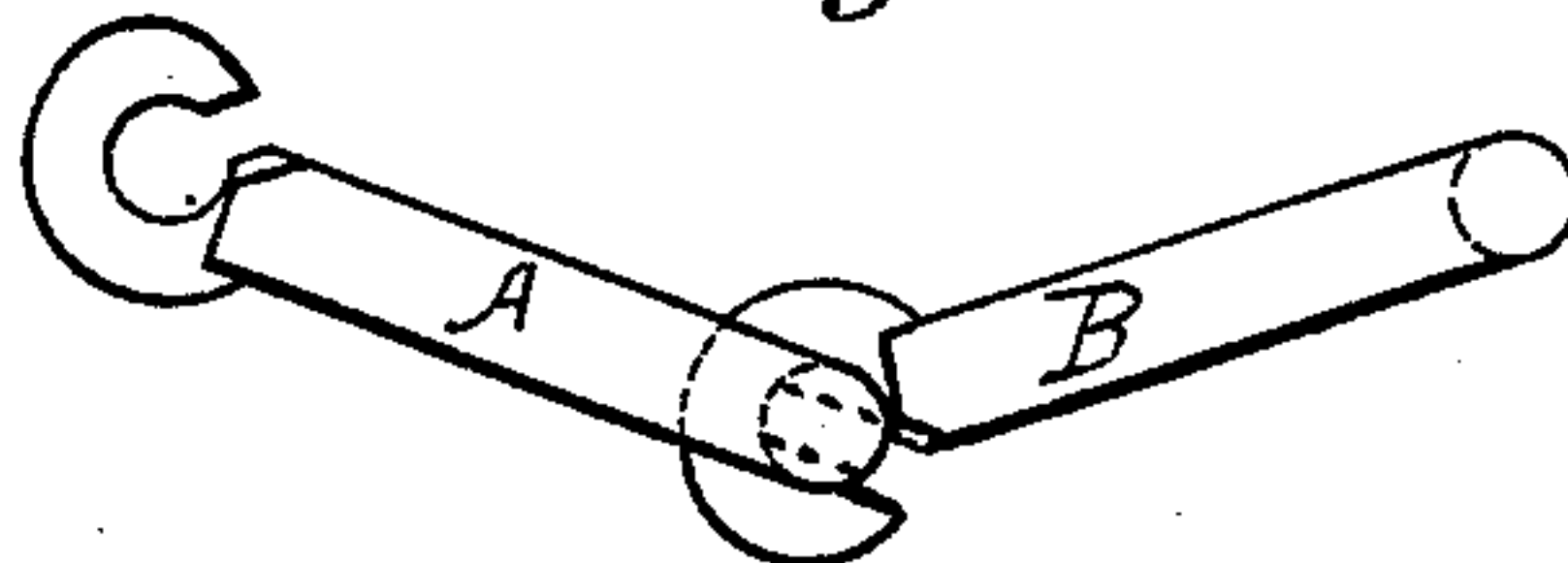


Fig. 6.



Witnesses  
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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN LINKS FOR DRIVE-CHAINS.

Specification forming part of Letters Patent No. **214,409**, dated April 15, 1879; application filed November 29, 1878.

*To all whom it may concern:*

Be it known that I, CHRISTOPHER W. LEVALLEY, of St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Chains; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form part of this specification.

One part of my invention relates to a novel construction of drive-chain, consisting of two side bars, each terminating at one end in a hook, and provided at the other end with an inwardly-projecting pivot-lug of such size as will permit the lug to enter the throat formed between the end of the hook and the opposing and adjacent face of metal, near the base or heel end of said hook, the side bars being connected with each other by means of a tie-bar or other piece of metal.

The object of this part of the invention is to reduce the weight of the metal required for the chain, thereby decreasing its cost and promoting the durability not only of the chain but of the sprocket-wheels, which are driven by the chain, having found by experience that even a small reduction in the weight of the chain effects a great saving in the wear of these wheels.

Figure 1 is a plan view of one of my links, showing a closed side of the link. Fig. 2 is a plan view of the opposite side of the same link. Fig. 3 is a section of the pivots taken on line *xy*, Fig. 1. Fig. 4 is a side view showing the links in reversed positions. Fig. 5 is a side view showing the position in which the links must be placed in order to detach them when both hooks are turned in the same direction. Fig. 6 is a side view showing the position in which the links are placed for disconnecting when the positions of the hooks are reversed. Figs. 7 and 8 represent links, showing additional features of the invention.

Referring to Figs. 1 and 2, A B are the side bars, each terminating at one end in a hook, C, and provided at the opposite end with an inwardly-projecting pivot-spur, D.

By an examination of Fig. 2 it will be seen that the throat between the end of the hook and its adjacent base, or point of attachment with the side bar, is not of uniform width on account of a projecting nib,  $c^1$ , which makes the inner portion,  $c$ , of the throat narrower than the outer portion,  $c^2$ ; and it will also be seen that there is a corresponding difference in the construction of the pivot-lug at the opposite end of the side bar—that is to say, one side of said lug is cut away or recessed at  $d$ , and the other side is similarly recessed at  $d^1$ , in order that these pivot-lugs can be inserted within the hook only when the parts are in such position that the end of the hook shall pass the recess  $d^1$ , and the nib  $c^1$  shall pass the recess  $d$ , it being apparent that if the relative position of these parts be inverted the pivot-lugs will not enter within the hooks, because, although the nib  $c^1$  would readily enter the recess  $d^1$ , the end of the hook will not permit the passage of the shoulder  $d^2$ . D' is a tie-bar connecting the side bars, A B.

Referring now to Fig. 5, in which the hooks of both links are turned up, it will be seen that the links must be placed in the relation there shown, in order that the ends of the hooks may pass the recesses  $d^1$  to permit the ends of a chain to be connected or disconnected, which is sometimes desirable where the distance between the sprocket-wheels is such that a good deal of slack in the chain is either unavoidable or desirable, as the necessity of placing the links in this relation before detaching them insures that they shall not be accidentally disconnected; but under some conditions it is impracticable to obtain much slack in the chain, and in such cases one link may be reversed—that is to say, have its hook turned the other way, as indicated in Fig. 6—when it will be found that the ends may be connected or disconnected by merely placing these reversed links in the relation shown in that figure.

In Fig. 7 I dispense with the tie-bar D', and unite the parts by means of a tie,  $e$ , connecting the ends of the hooks, and by preference I provide this construction of link with projecting ears  $a$   $b$ , which fit closely the outer surfaces of the opposite ends of A B and prevent any spreading of these ends, thus insur-



ing that the pivot-lugs shall fit closely to the hooks throughout the entire length of the lugs and width of the hooks, whereby the greatest strength and efficiency are secured.

In Fig. 8 the side bars are connected with each other at their opposite ends, the pivot-lugs forming a continuous bar for that purpose, and I provide said bar upon its side with a nib, *e'*, which enters between the hooks C C.

As above stated these links are intended to be formed into a chain adapted to engage with the projecting spurs of a sprocket-wheel, which spurs, as ordinarily constructed, project from the periphery of the wheels, and are square or rectangular in cross-section, and it is desirable that the links of the chain should be so constructed as to pass over and fit closely the bases or widest portions of the lugs in any position—that is to say, whether the links of the chains be placed either side up, or whether they be driven in one direction or the other, in passing over the wheels—for which reason it is desirable that the side bars A and B should be parallel with each other.

In order to preserve this parallelism of the bars A and B, I have placed the hooks C not at the ends of the bars, so as to form continuations thereof, and in the same planes with the bars, but have connected them (the hooks) to the inner faces of the bars in the same planes with the pivots D in such manner that the outer faces of the hooks will, when the links are connected, fit closely the inner faces of the ends of the bars to which the pivots are adapted. This construction permits the bars to be connected with each other in such manner as to maintain their parallelism.

It is apparent that when the chain is under tension there is a tendency to draw the hooks toward each other, and to prevent their approach I prefer to use a continuous bar, as shown in Fig. 8, instead of the pivots D, and provide this bar with a nib or stop, *e'*, which enters between the ends of the hooks and prevents such approach, thus insuring that the bars *f' f'*, Fig. 8, shall engage with the entire width of the hooks, thereby preventing undue strain upon any part.

In Fig. 7 I have shown a construction which accomplishes the same result. In this figure the side bars are connected by means of an intermediate tie, *e*, which joins the hooks, each bar being provided with a projecting ear, as at *a* and *b*, and from an examination of this figure it will be readily seen that when the

links are connected the lugs D will be maintained in the desirable relation to the hooks, because the ears *a b* will prevent the bars A and B from spreading.

From the above description it will be seen that a chain constructed as shown in Figs. 4, 5, or 6 will fit equally well upon the lugs of the sprocket-wheel whichever side up the chain may be used, and will run upon said wheel equally well in either direction—that is to say, whether the chain is so arranged that the hooks or the opposite ends of the links engage first with the wheel.

I do not in this patent claim a chain-link having the throat in its hook of irregular form, as that feature of construction constitutes the subject-matter of another application filed by me.

What I claim is—

1. A chain-link composed of two side bars, each provided at one end with a pivot-lug which projects inwardly at a right angle from the bar, and at its opposite end with a hook which is attached to and projects inwardly from the bar, said bars being connected with each other at one point only, substantially as set forth.

2. A chain-link composed of two side bars, each provided at one end with a pivot-lug which projects inwardly at a right angle, but does not connect with its opposing lug, and at the other end with a hook which projects inwardly from the bar, the said bars being connected with each other at or near the hooks only, substantially as set forth.

3. A chain-link composed of two side bars, each provided at one end with a pivot-lug which projects inwardly at a right angle, but is not attached to the other lug, and at its other end with a hook which projects inwardly from the bar, the side bars being connected with each other by means of the tie *e* between the hooks, substantially as set forth.

4. A chain-link provided with projecting ears *a b* to retain the pivots of the engaging link in proper position relative to the hooks, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHRISTOPHER W. LEVALLEY.

Witnesses:

H. H. BLISS,  
S. WOLF.