

(No Model.)

2 Sheets—Sheet 1.

C. E. HART.
DRIVE CHAIN.

No. 476,635.

Patented June 7, 1892.

Fig. 1.

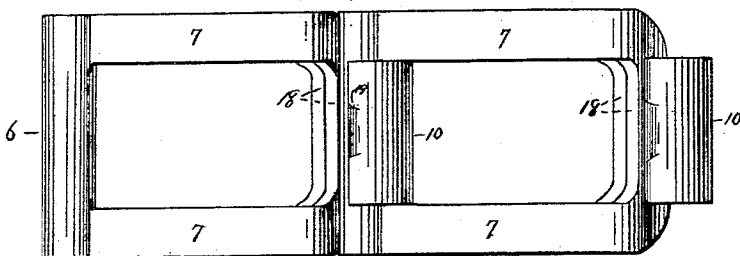


Fig. 2.

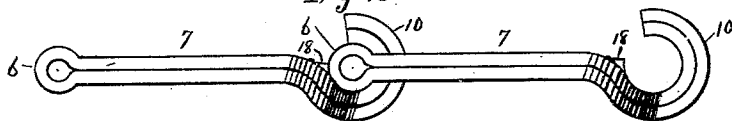


Fig. 3.

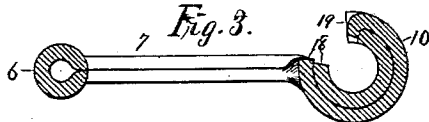
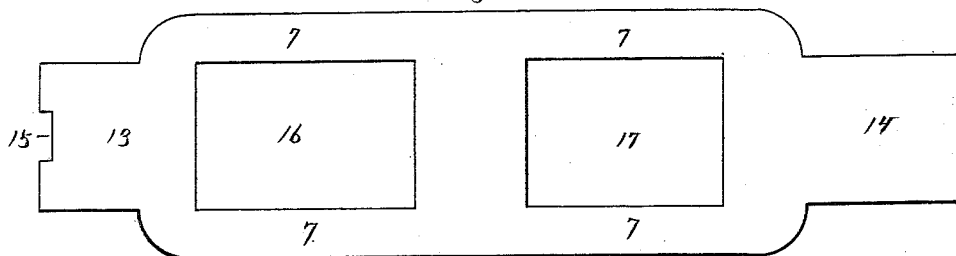


Fig. 4.



Witnesses.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

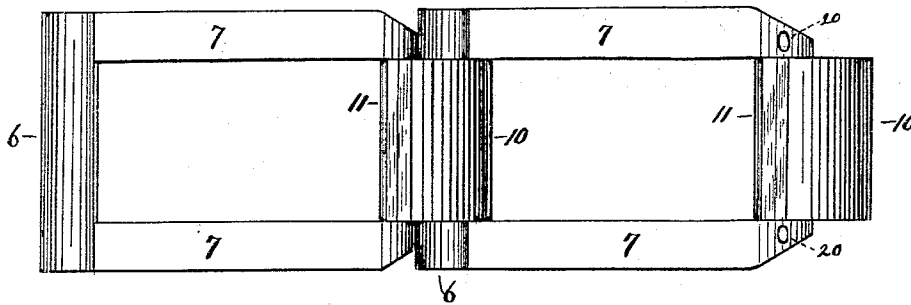


Fig. 6.

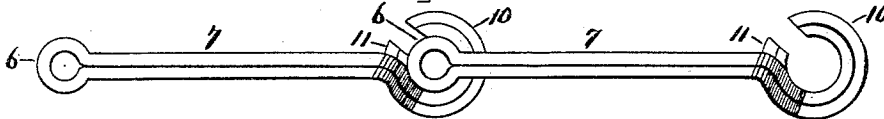


Fig. 7.

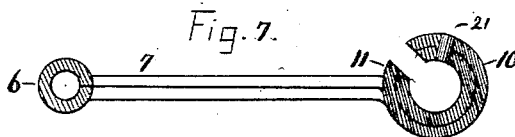


Fig. 8.

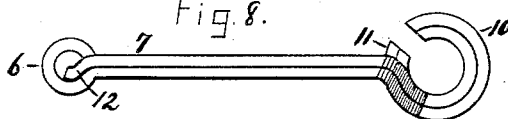
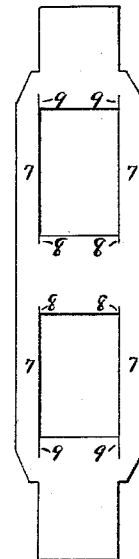


Fig. 9.



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UNITED STATES PATENT OFFICE.

CHARLES E. HART, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE
STANLEY WORKS, OF SAME PLACE.

DRIVE-CHAIN.

SPECIFICATION forming part of Letters Patent No. 476,635, dated June 7, 1892.

Application filed November 19, 1891. Serial No. 412,410. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. HART, a citizen of the United States, residing at New Britain, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Drive-Chains, of which the following is a specification.

My invention relates to improvements in sheet-metal drive-chains; and the chief object of my improvement is to produce a strong link of thin sheet metal.

In the accompanying drawings, Figure 1 is a plan view of two links of my drive-chain properly connected. Fig. 2 is a side elevation of the same. Fig. 3 is a central longitudinal section of one link. Fig. 4 is a plan view of the blank from which said link was formed. Fig. 5 is a plan view of two links of my chain properly connected, showing a slightly-modified construction. Fig. 6 is a side elevation of the same. Fig. 7 is a central longitudinal section of one of the links of Figs. 5 and 6. Fig. 8 is a side elevation of one link, showing another slightly-modified construction; and Fig. 9 is a plan view, on a reduced scale, of the blank for making the links shown in Figs. 5, 6, and 7.

My chain is of the class wherein the links each have at one end an open-knuckle portion and at the other end a pintle portion, the pintle portion of one link being adapted when in a certain position to be slipped endwise into the knuckle portion of one of the other links for securing them together. An example of a drive-chain of this class in cast malleable iron is found in Patent No. 154,594, dated September 1, 1874, and an example of the same in sheet metal is found in Patent No. 307,011, dated October 21, 1884.

I prefer to first make a blank, which in plan view is substantially the contour of two links with the pintle ends abutting each other, as shown in Fig. 4, and I double said blank upon itself by transverse bends at the middle of its length and in so bending form the pintle portion 6 of the complete link at one end of the side bars 7, the two thicknesses of metal in the side bars lying close together, as shown, while the pintle portion is rolled over into a round form, as shown. The tongue 13 on that

end of the blank which is to form the inside of the knuckle portion 10 is shorter than the tongue 14, which is to form the outside of said knuckle portion. I also make the opening 16 at the end of the blank having the short tongue a little longer than the opening 17 at the opposite end. That end of the doubled blank which is opposite the pintle portion 6 and consists, mainly, of the long and short tongues is rolled or coiled into the knuckle portion 10.

The link is formed in dies, portions of which enter the space between the side bars 7 and swage or bend up the short lips 18 from the edge of the metal lying between the knuckle end of the side bars 7, so as to make the inner edge of the slot in the knuckle portion stand up a little above the junction of the side bars and knuckle portion, as shown. The swaging-dies will also enter the inner side of that part of the pintle portion that lies between the ends of the side bars and give said pintle portion a circular form in cross-section, as shown in Fig. 3, the metal at the inner corners of the side bars and pintle portion being indented or broken in by the dies, or said corners may be slit when in the blank, as hereinafter described. The modification illustrated in Figs. 6, 7, and 9 has the same general construction.

I prefer, when cutting out the middle portion of the links, to form short slits 8 9, Fig. 2, at the corners, whereby in rolling the pintle portion 6 the edges lying between the slits 8 may be turned in to perfect the pintle portion, leaving it in the form of a complete circle, as shown by the sectional view, Fig. 7. The lips or metal portions lying between the slits 9 are rolled up in the form of lips 11 inside the side bars and form a continuation of the circle on which the knuckle portion is coiled or rolled. In this construction, like that first described, the lip in one thickness of metal extends up between the side bars in the other thickness of metal and tends to hold the two thicknesses against lateral displacement. The lips 11 are shown and described as the equivalent of the lips 18. These bent-up lips 11 I consider the equivalent of the swaged lips 18, before described.

If the tongues in the blank for the knuckle

portion are left a little longer than is necessary, the space between the end of the knuckle portion and the lips 11 is dressed out to form a slot, whose width is about the same as the thickness of the complete side bars, and which will permit said side bars to pass through edgewise. So, also, the inside diameter of the knuckle portion and the diameter of the pintle portion in all of my links is such that the latter will fit inside of the former, as shown. By turning one link upon the adjoining one until the side bars are in lateral alignment with the space in the knuckle portion it may be slipped laterally and detached, and they may be assembled by reversing this operation, all substantially as in other hooks of this class.

While I have described doubling the first blank upon itself, it is evident that the blank may, before it is doubled, be struck in dies to form partial bends in the knuckle and pintle portions to facilitate the operation of rolling and completing said portions in a manner analogous to that employed in striking hinge-blanks preparatory to rolling the knuckles. It is also evident that the blank may have the middle portion cut out therefrom after the metal has been doubled upon itself. In fact such changes in making the article as do not materially change the article may be practiced, if desired.

In Fig. 8 I have shown substantially the same article, excepting that it is made of two pieces of sheet metal instead of one. At the pintle portion I extend the end edge 12 of one piece within the roll of said pintle portion, as shown, leaving the knuckle portion and general form of the complete link the same as in the construction before described.

By making the side bars and the knuckle portion for its whole width in two thicknesses I produce links of great strength, especially at the part of the knuckle portion leading from the ends of said side bars, while at the same time they are cheaply and easily formed. By making the lips either bent or swaged inside of the side bars the entire space in the knuckle portion is carried slightly away from the junction of the side bars and knuckle portion, so as to bring it into better position for putting the links together.

While I have shown a chain of a certain

class to which my improvements are especially applicable, it is evident that some features of my improvements are applicable to chain-links in other classes—for example, the knuckle portion alone has certain advantages which remain the same no matter what the construction of the opposite end may be.

I am aware that the tongue of the hook in the Patent No. 307,011, hereinbefore referred to, is reinforced by an extra thickness by doubling the metal upon itself at a point back of the curved or rolled portion of the knuckle; but this does not prevent the two thicknesses of the knuckle from slipping one upon the other and unrolling under a severe strain. So far as the bend where these two thicknesses are united bears any resemblance to my link, it is the equivalent of doubling the metal upon itself at the pintle portion and not the equivalent of my lock 19, Fig. 3, 20 in Fig. 5, and 21 in Fig. 7. In fact, the knuckle portion of this Patent No. 307,011 will be improved by my lock in precisely the same way as said lock improves the knuckle portion of my link.

In one end of the blank, Fig. 4, I have shown a notch 15, and in Figs. 1 and 3 I have shown a portion 19 of the outer thickness of the knuckle portion bent or swaged into this notch to lock the two thicknesses of metal in said knuckle portion together, and in Fig. 5 I have shown pins 20 passing through both thicknesses for the same purpose, and in Fig. 7 a single pin 21; but a knuckle portion of two thicknesses thus fastened together, as originally shown and claimed in this specification, is now made the subject of a divisional application, and therefore it is not herein claimed, and, further, its presence or absence is not material to a link having the lips 18 or 11.

I claim as my invention—

In a drive-chain, the links having side bars in two thicknesses of sheet metal, the knuckle portion 10, formed at the end thereof, and the lips 18, bent or swaged up inside of said bars, substantially as described, and for the purpose specified.

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Witnesses:

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A. G. BEACH.