

(No Model.)

J. KINDER.
CONSTRUCTION OF CHAINS.

No. 355,454.

Patented Jan. 4, 1887.

Fig. 1.

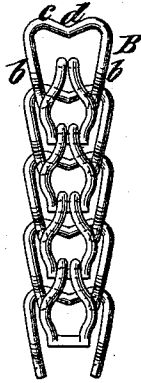


Fig. 2.



Fig. 3.*

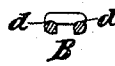


Fig. 4.

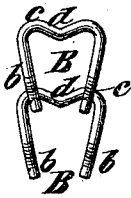


Fig. 5.



Witnesses:

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Inventor:

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By his Atty
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UNITED STATES PATENT OFFICE.

JULIUS KINDER, OF BROOKLYN, ASSIGNOR TO THE SOLID LINK CHAIN
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CONSTRUCTION OF CHAINS.

SPECIFICATION forming part of Letters Patent No. 355,454, dated January 4, 1887.

Application filed July 1, 1886. Serial No. 206,859. (Model.)

To all whom it may concern:

Be it known that I, JULIUS KINDER, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Chains, of which the following is a specification.

My invention relates particularly to chains in which are employed two series of open links, each consisting of a cross-portion, and loops extending in the same direction and at right angles to the cross-portion, the loops of each link in each series embracing the cross-portion of the next link in the same series, and the links in the two series being alternated lengthwise of the chain, and being arranged at right angles to each other in planes which extend lengthwise of the chain.

In chains of the character above described, as heretofore constructed, the cross portion in each link between the bends which connect it with the loops of the link has been curved in a direction opposite to the direction in which the loops are presented, and, consequently, when strain has been applied to the chain the loops of each link have had a tendency to draw and come together at the middle of the cross portion of the link which they embrace, and the flexibility of the chain has been greatly impaired thereby.

Important objects of my invention are to provide a chain of the above kind which will retain its great flexibility after being strained lengthwise and while still under strain, and which may therefore be used as a substitute for sash-cord and in other places where a chain is desired which has great strength and flexibility; also, to provide a chain having solid links, or links which, though cut from metal having opposite flat surfaces, and therefore made without joint, will present the appearance of being made from wire.

The first object above stated I accomplish by making the bends which connect the loops and cross portion of each link with as great or greater projection than has the middle of the cross portion in a direction opposite to that in which the loops are presented, whereby the loops of each link, when strain is applied to the chain, will tend to draw away from each other and will not tend to draw together and

to the middle of the cross portion. The said cross portion might be straight between the bends which connect it with the loops; but I prefer to form it with an inward bend in the same direction as that in which the loops are presented, and then when the cross portion is embraced by the loops of an adjacent link on opposite sides of the inward bend and strain is applied the bend in the cross portion will prevent the loops which embrace it from drawing to the middle and straining the cross portion outward in such manner as to form a short and sharp outward bend, in which the loops will wedge, and which will destroy the flexibility of the chain.

To simulate the appearance of wire links, I prefer to stamp the links from flattened wire, which will give them round edges, and I round the side bars or members of the link transversely to their length and on their top surfaces.

The invention will be hereinafter more fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 represents upon a large scale a piece of chain embodying my invention. Fig. 2 is a side view of a blank for a link. Fig. 3 is a plan, and Fig 3* a transverse section, of the link. Fig. 4 represents two links embodying my invention and connected together, and Fig. 5 represents links of the old form prior to my invention, and as they would appear after the chain in which they were used had been subjected to severe tensile strains.

Similar letters of reference designate corresponding parts in all the figures.

B designates the open links of which the chain is composed. Each link has substantially parallel side bars or members connected at the ends, and the links are arranged in two series, the links of the two series being alternated in the length of the chain, and being arranged at right angles, or transverse to each other, in planes which extend lengthwise of the chain. In other words, the planes of articulation of the two series of links are at right angles, or transverse to each other. Each link B is solid; or, in other words, its side bars or members and ends are formed integral and without joint. Each link in the finished chain

comprises loops *b*, which are formed by the end portions of the link bent in the same direction, and also comprises the cross portion *c*, extending between the loops. In the chain each link B embraces by its loops *b* the cross portion *c* of a link on one side, and is embraced at its cross portion *c* by the loops *b* of the link adjacent on the other side.

In the chains of this class heretofore made the cross portion *c* has had an outward curvature in a direction opposite to the loops *b*, or upward, as shown in the drawings; or, in other words, the middle of the cross portion *c* has had a greater projection in a direction opposite the loops than the bends which connect the cross portion with the loops.

Now, it will be readily seen that although a chain having its links formed with cross portions curved or bent outward in the opposite direction to the loops would be sufficiently flexible before being subjected to severe strain, and so long as the links retained their perfect form, it would lose its flexibility after being subjected to severe strain, because the loops of each link tend to draw to the middle of the cross portion of the link which they embrace, and produce a sharp outward bend in such cross portion, as shown in Fig. 5, and in which bend the loops have a tendency to wedge.

To prevent the distortion of the links above described, I form each cross portion *c* with an inward bend, *d*, at the middle, extending in the same direction as the loops *b*. In other words, I give the bends which connect the cross portion *c* with the loops *b* a projection as great or greater than the middle of the cross portion in a direction away from or opposite the loops. This bend serves to spread the loops *b* of the next link, which embrace the cross-bar and cause them to pull outward, and therefore the bend *d* not only braces the cross portion and makes it more difficult to bend it outward, but it also prevents the loops which embrace the cross portion from drawing toward the middle and exerting their strain at a point where the cross portion is least able to resist it.

It will be seen from Fig. 3* that the top surfaces of the side bars or members of the link are rounded transversely to their length. This gives the link the appearance of being made from wire, although it is a solid link punched from sheet metal.

The method of producing the bend *d* and also imparting roundness to the top surface of the link forms the subject of my pending application for patent, filed of even date herewith, and numbered 206,860, and is not here claimed.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The chain herein described, composed of

two series of similar open links, B, each link consisting of a cross portion, *c*, and loops *b*, extending at approximately right angles thereto in the same direction, the bends which connect the cross portion *c* and loops *b* having as great or greater projection in a direction opposite the loops than has the middle of the cross portion, the loops of each link in each series embracing the cross portion of the next link in the same series, and the links of the two series being alternated lengthwise of the chain and being arranged at right angles to each other in planes which extend lengthwise of the chain, substantially as herein described.

2. The chain herein described, composed of two series of similar open links, B, each consisting of a cross portion, *c*, and loops *b*, extending at approximately right angles thereto in the same direction, the cross portion *c* of each link having in its two members the inward bend *d*, in the same direction as that in which the loops are presented, the loops of each link in each series embracing the cross portion of the next link in the same series, and the links of the two series being alternated lengthwise of the chain, and being arranged at right angles to each other in planes which extend lengthwise of the chain, substantially as herein described.

3. The solid chain-link B herein described, comprising two members extending side by side and connected at the ends, and having its end portions bent to form loops *b*, extending in the same direction, and having in the two members of its cross portion *c* the inward bend *d*, in the same direction as the loops, substantially as herein set forth.

4. The solid chain-link herein described, composed of two members extending side by side and connected at the ends by square or straight cross-bars, and having the end portions bent to form loops *b*, extending in the same direction, and having in the two members of its cross portion *c* the inward bend *d*, in the same direction as the loops, substantially as herein set forth.

5. The solid chain-link B herein described, composed of two members extending side by side and connected at the ends, the link having its side bars or members rounded transversely to their length on the top surface and its end portions bent to form loops *b*, extending in the same direction, and having in the two members of its cross portion *c* the inward bend *d*, in the same direction as the loops, substantially as herein set forth.

JULIUS KINDER.

Witnesses:

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