(No Model.)

G. G. HOWE.

CHAIN.

No. 494,423. Patented Mar. 28, 1893.

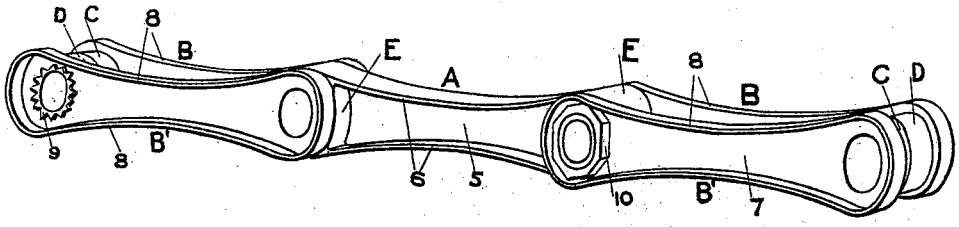

FIG. 1

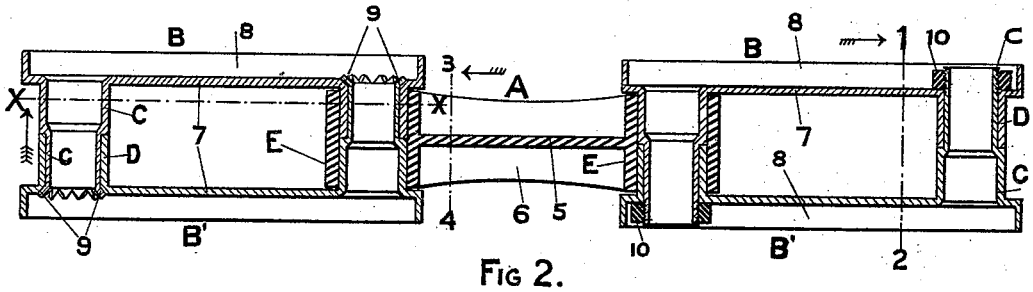

FIG 2.

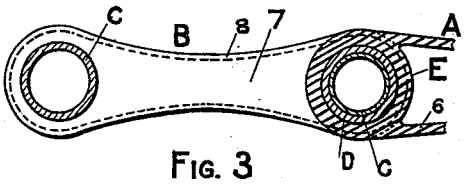

FIG. 3

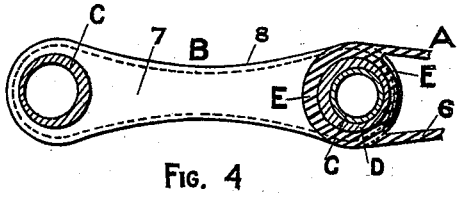

FIG. 4

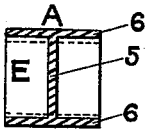

FIG. 6

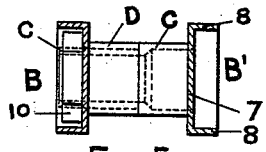

FIG. 5

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UNITED STATES PATENT OFFICE.

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CHAIN.

SPECIFICATION forming part of Letters Patent No. 494,423, dated March 28, 1893.

Application filed July 30, 1891. Serial No. 401,129. (No model.)

To all whom it may concern:

Be it known that I, GLENN G. HOWE, a citizen of the United States, residing at Indianapolis, Marion county, Indiana, have invented certain new and useful Improvements in Chains, of which the following is a specification.

My invention relates to that type of drive-chains, in which some, or all of the links have hollow end-bars, and in which the links are articulated in such a manner that they all lie in the same plane, and constitute what is commonly known as a flat chain. Heretofore in the construction of such chains, it has been customary to use solid pintles, or bolt-like devices, of comparatively small diameter, passing through the hollow end-bars of some of the links, and constituting end-bars for some others of the links; although it has been suggested to articulate alternately arranged single and double bar-links through the medium of hollow end-bars to some of the links, which hollow end-bars, however, were divided midway of their length, and the parts interlocked and held in a locked condition by the draft strain on the chain, while all the links thereof should be in a working position. The last named construction of chain which has been proposed, but which, so far as my knowledge extends, has never gone into practical operation to any extent, involves the objection of a liability to casual uncoupling, or derangement of the interlocked links of the chain, while in that form of flat chain first above referred to, it has been found, in practice, that, when subjected to heavy draft strains, the frictional draft strain necessarily rapidly wears away the comparatively small, solid end-bars, or pintle-like devices of the chain, and in practice it is understood, of course, that in order to increase the bearing surface, and thus render such construction of chain more durable, the weight of the finished article would be so materially increased, as to be a serious objection, both as to the expense of manufacture and the increased gravity of the finished article.

My invention has for its object, mainly, to overcome these difficulties, and to provide for use a chain in which, without any comparative increase in the weight of the finished article, the chain will be capable of standing severe frictional draft strain, without a rapid wearing away of the articulations, or members, of the hinge-like joint of the chain.

To these main ends and objects, my invention consists in the novel construction of chain, which will be hereinafter more fully described, and which will be more particularly pointed out in the claims of this specification.

To enable those skilled in the art to which my improvements relate, to understand and practice the same, I will now proceed to more fully describe my invention, referring by letters to the accompanying drawings which form part of this specification, and in which I have shown my invention carried into effect in that precise form of chain in which I have, so far, successfully practiced it.

In the drawings, Figure 1 is a perspective view of a chain constructed according to my invention. Fig. 2 is a horizontal central section of the coupled links, shown in perspective at Fig. 1. Fig. 3, is a vertical longitudinal section, taken in a plane indicated by the line *x*, *x*, at Fig. 2, and looking in the direction denoted by the arrow in said figure. Fig. 4, is a similar sectional view; but showing an eccentric arrangement of the devices constituting the articulations of the chain. Fig. 5, is a vertical cross-sectional view taken at the line 1, 2, of Fig. 2, and Fig. 6, is a similar sectional view taken in a plane indicated by the line 3, 4, of Fig. 2.

In the several figures the same part will be found always designated by the same letter of reference.

Although in the drawings I have illustrated my invention as embodied in a chain composed of alternately arranged single bar and double bar links, it will be understood, of course, that the novel features of construction made the subject of this application might be embodied in a chain in which all the links would have two side bars.

In the drawings A is one of the single bar-links, and B, B, are two of the double side bar-links, one end of each of which, as shown, is articulated with, or coupled to, one end of the single bar-link A.

In the chain, as shown, C and D, are re-

spectively, the long and short hollow projections of the side bars of the link B, which projections, as clearly shown, are arranged telescopically, in assembling the parts of the chain, and are enveloped, or surrounded, (circumferentially) by the tubular, or hub-like, ends E, of the links A. The single bar-links A, it will be seen, comprise, each, a plate-like body portion 5, and lateral ribs 6, projecting from both sides of the portion 5, which ribs add strength to the link, so as to make its capacity for draft strain ample, as compared with that of the double bar-links B, B, which latter, as seen, have side bars comprising each a center plate, or body-portion 7, strengthened by laterally projecting ribs 8.

In the double bar-link seen at the left hand side of Figs. 1 and 2, I have shown the extreme ends of the longer, hollow, side bar projections C, C, (which pass through the shorter hollow devices D, D,) as being up-set, or riveted; to hold the assembled parts C, C and D, D, and their integrally connected side-bars securely together; while in the link B seen at the right hand side of said figures, I have shown these parts of the link fastened together by means of nuts 10, which engage with the screw-threaded projecting, ends of the longer, hollow, devices C, C'; all as clearly illustrated.

In assembling the parts of a chain made as herein shown and, so far, described, the short and long, hollow projections D, D, and C, C of the side bars of a double link B, are put together telescopically, and, at the same time are inserted within the tubular part E, at one end of each of two of the single bar-links A; and, so on, in making up the chain to any required length.

It will be observed that in a chain such as herein shown and described, not only are the plate-like body-portions and their side ribs composed of thin stock, so that these parts are easily malleableized; but that by reason of the novel structural feature of the hollow end-portions C, D, of one link, working, articulately, within the tubular portion E of another link, the chain is rendered comparatively very strong and very light in the hinge-joints, while, at the same time, these joints are rendered extremely durable by reason of the enlarged wearing surface, due to the increased diameter of the parts which turn on each other.

An eccentric arrangement of the cores, in casting the hollow projections C, D, of links B, and the tubular ends E of links A; so as to effectuate such an arrangement of the parts, when assembled, as seen at Fig. 4, will increase the durability of the parts, or their capacity for wear, without an undue weakening of the chain, while, at the same time, the thickening-up, in this manner, of portions of the said parts, will not materially increase their weight, nor interfere with the easy and perfect malleableization of them.

I prefer that each side-bar, of the links B, be formed, or provided, with one long hollow, laterally projecting, device C, and one short one D, as shown; in order that all the bars of said links may be duplicates, and, hence, interchangeable; and, furthermore, because under this special arrangement of the parts, any unevenness in the patterns, or castings, of the parts, that might tend to throw the draft strain (in running the chain) on one side of the chain, will be neutralized, by the distribution of such uneven casting in the links, first on one side and then on the other, on each link, throughout the whole chain.

It will be seen that in my improved chain, there is no tendency to a loosening, or cutting, of the end-bars, where they are fastened to the side-bars of a link, by the constant turning on said end-bar (under draft strain) of the encircling tubular end of another link; such as exists in some of the chain structures heretofore commonly used; since, in my chain those parts, of the hollow end bars of the link B, which are subjected to the strains, both transverse and twisting, when the chain is running, are, by preference, made integral with one of the side-bars of said link B.

Although I have shown the shorter devices D, as extending to about the middle of the hollow end-bar C, D, the relative lengths shown, of the parts C and D, may be varied to any extent desired.

Having now so fully explained the novel structural features of my improved chain that those skilled in the art to which my invention relates can make and use a chain embodying the latter, either in the precise form shown or under some modification, what I claim as new, and desire to secure by Letters Patent, is—

1. In a drive-chain, the combination, with a link formed or provided with a tubular end-portion E, of a link having two side-bars, and two hollow end-bars each of which is secured, at one end, to one of said side-bars; all substantially as and for the purposes set forth.

2. In a centrally open drive-chain link, the combination, with two side-bars, of two hollow end-bars, each of which is long enough to extend, from one side to and through the other, and is provided, at its free end, with a means of securement to the side bar through which it passes; substantially as and for the purposes hereinbefore set forth.

GLENN G. HOWE.

Witnesses:
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E. P. FLETCHER.