

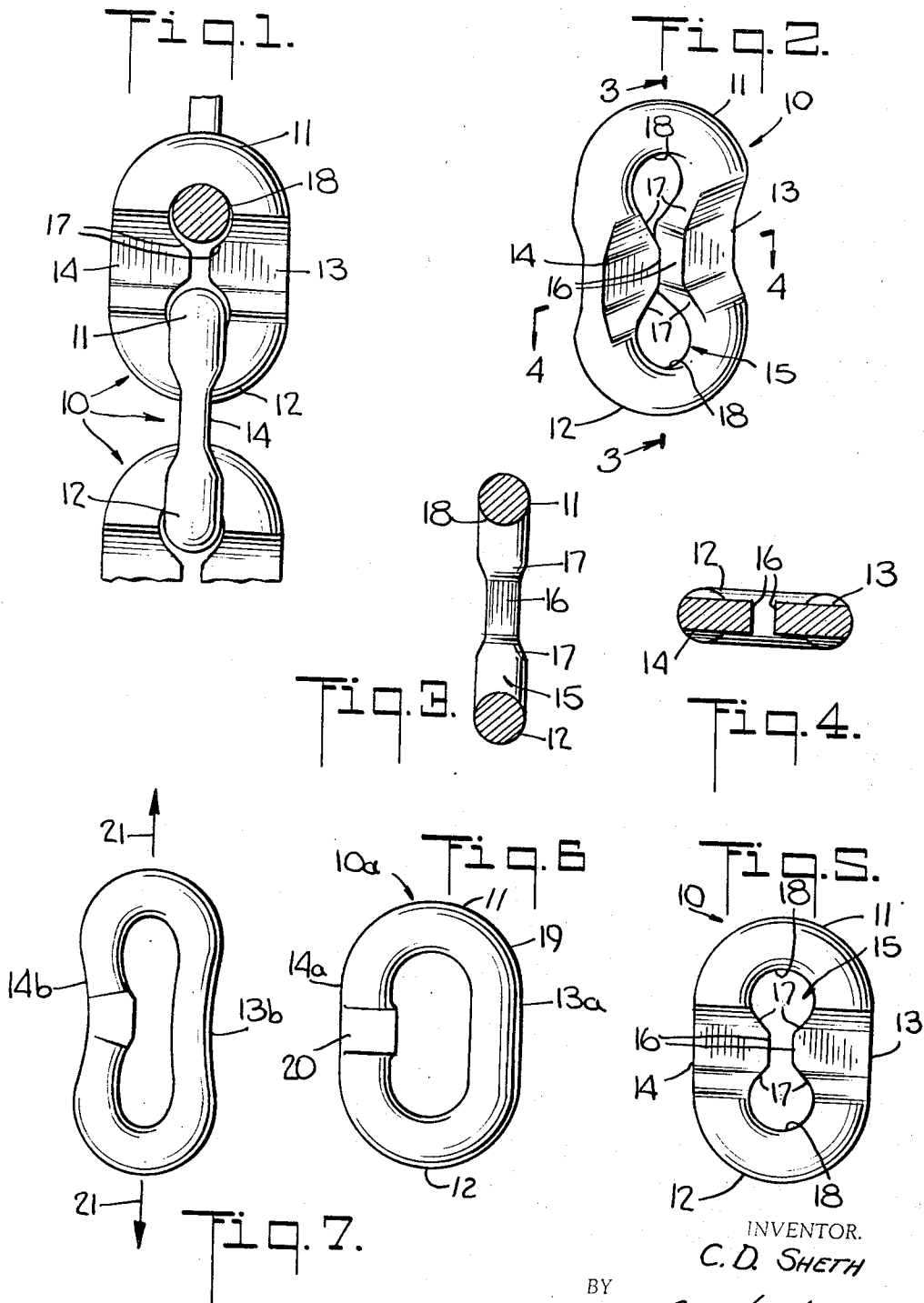
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CHAIN LINK

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CHAIN LINK

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ABSTRACT OF THE DISCLOSURE

Each side portion of an open chain link is forged to a thinner and deeper section that projects into the link opening, but not outwardly from the link periphery. The side portions more effectively accept the bending stresses incidental to load, strengthening the link, yet the inwardly projecting sections are somewhat spaced so that they cannot transfer stress to one another. Thereby the link achieves advantages of a stud link without a fault of a stud link.

This invention relates to chain links, and more particularly to a novel link that will better accept the forces that may be imposed upon it.

As an important feature of my invention, I form a chain link with opposed side portions that will very effectively resist bending due to tension on the chain. In more detail, each side portion of my novel link has a sectional shape that is relatively deep in the plane of the bending stresses, while being relatively thin as compared with end portions of the link. The depth of the sections is achieved through parts that extend into a central opening of the link, but that are in spaced relation to each other so that there will be no direct transfer of stress between the side portions of the link.

As another feature, I form my novel chain link with side portions that have improved micro structure. More particularly, each side portion is forged to a sectional shape that differs from its original shape. As a further important feature, a forged portion of my link may comprise a weld that was made incidental to manufacture of the link.

I have thus outlined rather broadly the more important features of my invention in order that the detailed description thereof that follows may be better understood, and in order that my contribution to the art may be better appreciated. There are, of course, additional features of my invention that will be described hereinafter and which will form the subject of the claims appended hereto. Those skilled in the art will appreciate that the conception on which my disclosure is based may readily be utilized as a basis for the designing of other structures for carrying out the several purposes of my invention. It is important, therefore, that the claims be regarded as including such equivalent constructions as do not depart from the spirit and scope of my invention, in order to prevent the appropriation of my invention by those skilled in the art.

In the drawing:

FIG. 1 shows a portion of a chain utilizing my novel link,

FIG. 2 shows a perspective view of one link,

FIG. 3 shows a longitudinal section on the line 3—3 in FIG. 2,

FIG. 4 shows a transverse section on the line 4—4 in FIG. 2,

FIG. 5 shows a front view,

FIG. 6 shows a blank utilized in forming my link,

FIG. 7 illustrates some effects of chain tension on a conventional link.

Referring now more particularly to FIG. 2 of the drawing, my novel chain link is indicated generally by the numeral 10, and includes opposed end portions 11, 12 that are connected by two side portions 13, 14 so as to en-

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close a central opening 15. It will be appreciated that the link 10 will be formed while at least one adjoining link is engaged in the opening 15, but to show my invention more clearly I have omitted adjoining links from FIGS. 2 to 7. The link 10 is substantially flat and, as best seen in FIG. 5, its outer periphery may have a usual ovoid shape extending in a straight line along each side portion 13, 14 and over rounded surfaces on end portions 11, 12.

Each side portion 13, 14 of my novel link has a particular sectional shape that is thin as compared with the section of the end portions 11, 12, and that lies in the plane of the link. Further, the thin sectional shape has an inner part 16 extending into the link opening 15, increasing the depth of the side portions 13, 14, in the plane of the link. While being relatively thin, each side portion 13, 14, nevertheless may have a sectional area that is substantially equal to the section of end portions 11, 12. As will be seen in the drawing, the inner parts 16 of the link sides are in spaced relation to each other so that a portion of the central link opening 15 extends between the side portions 13, 14, and there will be no direct contact that will allow a transfer of stress between the side portions 13, 14.

Further, the inner parts 16 of the side portions 13, 14 contribute surfaces 17 that are in opposed relation to transverse grooves 18 formed by the end portions 11, 12 of the link. Those surfaces 17 will be effective to confine an adjoining link relatively to each end portion 11, 12, as shown in FIG. 1.

To fully explain the advantages of my novel link, I shall first call attention to the fact that in forming the link I may very readily utilize a blank 10a, FIG. 6, which is a simple and conventional flat link. The blank link 10a may be made in a manner that is customary in the industry, utilizing a length of metal 19 that has a substantially uniform cross section, and that is bent to ovoid shape and connected at its ends by a weld 20. Thus, the blank 10a has end portions 11, 12, and opposed side portions 13a, 14a, the latter portion 14a including the weld 20.

The side portions 13a, 14a of the blank 10a, FIG. 6, merely need be forged to form the side portions 13, 14 of my novel link 10, FIGS. 1 to 5, and in so doing the weld 20 naturally will be forged also. Thereby the metal in the side portions 13, 14 of my link will have better micro structure, and there will be a breaking up of certain types of inclusions that might cause failure of the link. Moreover, the weld of the link will be proven, and a weak weld may be detected before the chain is put into use.

It is important to know also the manner in which a usual chain link tends to deform when a load is applied to the chain. That tendency is illustrated in an exaggerated way in FIG. 7, in which I show link side portions 13b, 14b that have become bent toward the longitudinal axis of the link, due to chain tension indicated by the arrows 21. Through the forming of my novel link 10 in the sectional shape I have described, the side portions 13, 14 have a relatively deep section lying in the plane of the bending stresses. Moreover, the side portions 13, 14 have improved micro structure. Thus, each side portion will act very effectively to oppose the bending stresses that it must accept.

Since the side portions 13, 14 are in spaced relation to each other, they can not rupture due to a direct transfer of stresses between them. In addition, those skilled in the art will appreciate that the side portions 13, 14, by resisting bending, will more effectively oppose deformation of the end portions 11, 12. Should there actually be imposed a load that does cause bending, that bending will take place in the end portions 11, 12, merely causing the grooves 18 to set more effectively on the contour of the adjoining links.

I believe it will now be understood that I contribute an extremely novel chain link that is quite simple while having considerably greater strength, and that can be made at low cost. Moreover, a chain utilizing my links will resist tangling, and will substantially maintain its chain pitch even though subjected to considerable strain. I believe, therefore, that the very considerable value of my invention will be understood, and that its merits will be fully appreciated.

I now claim:

1. In a chain link of the class described having end portions for engaging adjoining links at opposed ends of a central opening, and two opposed side portions integrally connecting the end portions, the improvement that comprises each side portion formed to have a gradually reducing thickness while extending from each end portion of the link, the depth of each side portion increasing in a corresponding manner so as to maintain in the side portion a sectional area that will effectively accept stresses between the end portions of the link, a relatively thin medial section on the side portion, an inner part on each relatively thin medial section in opposed relation to the inner part on the other medial section and extending into the central link opening, said inner parts lying in spaced relation to one another so that the central link opening extends between said parts and the side portions of the link cannot directly transfer stresses to one another, and the depth of each side portion of the link increasing solely in a direction toward the link opening, so that the link may have a regular and unobstructed peripheral outline.

2. In a chain link of the class described having end portions for engaging adjoining links at opposed ends of a central opening, and two opposed side portions integrally connecting the end portions, the improvement that comprises each side portion formed to have a gradually reducing thickness while extending from each end portion of the link, the depth of each side portion increasing in a corresponding manner so as to maintain in the side portion a sectional area that will effectively accept stresses between the end portions of the link, a relatively thin medial section on the side portion, an inner part on each relatively thin medial section in opposed relation to the inner part on the other medial section and extending into the central link opening, said inner parts lying in spaced relation to one another so that the central link opening extends between said parts and the side portions of the

link cannot directly transfer stresses to one another, one side portion of the link comprising a weld, and the material of the side portions of the link being forged to form said side portions, the forged material including the material of the weld.

3. In a chain link of the class described having end portions for engaging adjoining links at opposed ends of a central opening, and two opposed side portions integrally connecting the end portions, the improvement that comprises each side portion formed to have a gradually reducing thickness while extending from each end portion of the link, the depth of each side portion increasing in a corresponding manner so as to maintain in the side portion a sectional area that will effectively accept stresses between the end portions of the link, a relatively thin medial section on the side portion, an inner part on each relatively thin medial section in opposed relation to the inner part on the other medial section and extending into the central link opening, said inner parts lying in spaced relation to one another so that the central link opening extends between said parts and the side portions of the link cannot directly transfer stresses to one another, and said inner parts of the medial sections approaching within a distance relatively to one another that is less than the thickness of each end portion of the link, so as to confine at one end portion of the opening of the link a similar link that may be assembled to the first-mentioned link.

4. A link construction as set forth in claim 3, together with each side portion of the first-mentioned link and its thin medial section having an outer surface extending in aligned relation to outer surfaces of the link end portions so that the peripheral outline of the link may be regular and unobstructed.

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