(No Model.)

W. N. WHITELEY.

PROCESS OF MAKING CHAIN LINKS.

No. 402,637. Patented May 7, 1889.

Fig. 1.

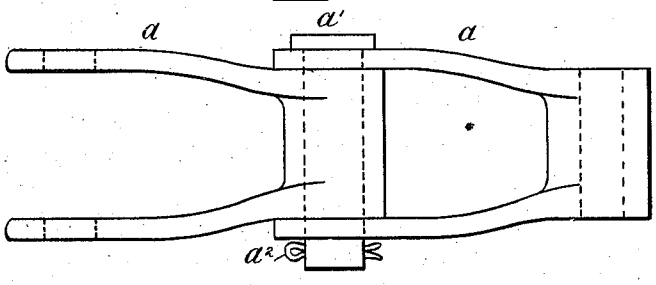


Fig. 3.

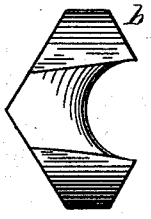


Fig. 2.

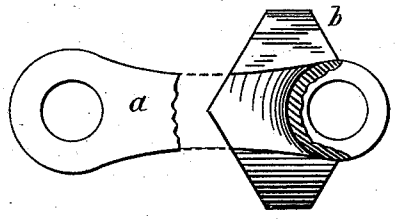
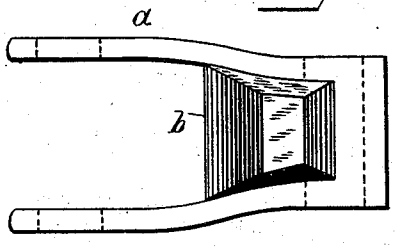


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, OF SPRINGFIELD, OHIO, ASSIGNOR TO THE WILLIAM N. WHITELEY COMPANY, OF SAME PLACE.

PROCESS OF MAKING CHAIN-LINKS.

SPECIFICATION forming part of Letters Patent No. 402,637, dated May 7, 1889.

Application filed June 7, 1888. Serial No. 276,317. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELEY, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Processes of Making Chain-Links; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Heretofore links for malleable chains have been made by simply taking molds of the patterns in the sand and running the metal into them in the usual manner. Where the side bars of said links are thin and attached to a heavy part at one or both ends, the shrinkage of the larger part is such as to weaken the link at point of juncture, and practically render it valueless.

The object of my invention is to make a chain that will be strong in all its parts and practical to make by the employment of a chill, as hereinafter described, in casting the links, and by a subsequent annealing process, thereby overcoming the shrinkage of the larger parts to the detriment of the smaller.

My invention relates to the manufacture of separable and other chains made in a special manner and employing special means, my object being to produce a stronger and better chain without increasing the weight or cost.

In order to make my invention more clearly understood, I have shown in the accompanying drawings a means for carrying it into effect.

In said drawings, Figure 1 is a plan view of two links joined together, showing one mode of fastening the links together to make a complete chain. Fig. 2 is a side view of a link with the chill in position, as used when the metal to form link is poured into the mold. Fig. 3 is an end view of the chill, showing it as if removed from link shown in Fig. 2. Fig. 4 is a plan view of a link with chill in position when the link is cast.

$a\,a$, Fig. 1, represent the two links connected by bolt a', which is held in place by split key a^2.

b is the chill.

In casting chain-links of the form herein shown, where the side bars join the main cylindrical part of the link, the heavy metal at the juncture of the arms of the chain-link causes a serious shrinkage, so that while in other respects the chain was very strong they usually broke off at this juncture. Attempts have been made to relieve this trouble by casting the cylindrical part upon a chill; but it has been found in experience that the chill is of practical value only when it is applied directly to the place where an unusual shrinkage would otherwise occur, and thus the metal is quickly cooled at the point of contact with the chill and kept perfectly compact and strong, while the other parts of the link cool off uniformly, or nearly so, and a solid casting free from shrinkage is thus produced. If the casting forming the chain-link is solid, however hard it may be by being highly charged with carbon, the subsequent annealing process reduces the hardness, and this is done more perfectly where it is charged very high with carbon than if with less. This insures a practical and reliable chain-link, and while the procedure is applicable to different styles of chain-links it is especially adapted to the form of link herein shown and described, which possesses many advantages over those ordinarily made and used, excepting the fact that in casting the links the imperfection caused by joining the bars to the cylinder rendered the chain impractical. This difficulty is now entirely overcome by the chilling process herein set forth.

My invention, being fully set forth and described in the foregoing specification, is fully illustrated by the accompanying drawings, by the aid of which any person skilled in the art can fully understand and apply my invention.

Heretofore it has been impracticable to cast chain-links with thin side bars and heavy ends, because of the irregular shrinkage in cooling, causing the casting to crack at the juncture of the thin and heavy parts; but by placing the chill as shown the links can be made perfect, as will be well understood by any one skilled in the art. I am aware that

chills have been used heretofore in connection with castings. Therefore I do not claim the chill broadly.

What I do claim, and desire to secure by Letters Patent, is—

Casting chain-links of high-carbon iron with a chill in their fork shaped to correspond therewith, for the purpose of making the casting solid where the sides join the cross-bars, and afterward removing the carbon from the iron by an annealing process.

In testimony whereof I affix my signature in the presence of two witnesses.

WILLIAM N. WHITELEY.

Witnesses:
WILLIAM H. BEVITT,
SOL J. HOUCK.