Jan. 12, 1954 G. B. SÖDERLUND 2,665,547

METHOD OF PRODUCING CHAIN-LINKS

Filed April 24, 1950

2 Sheets-Sheet 1

Fig. 1.

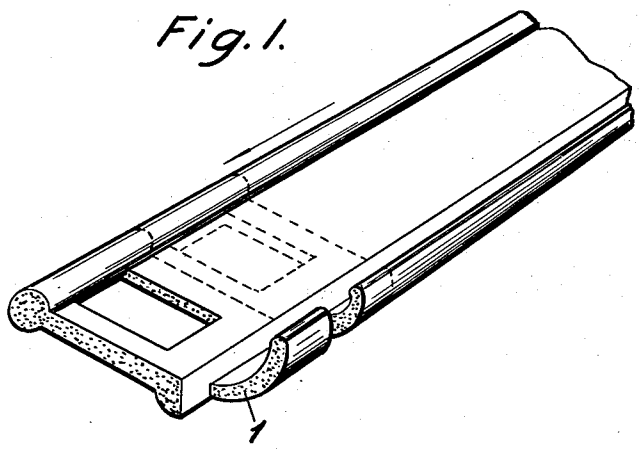
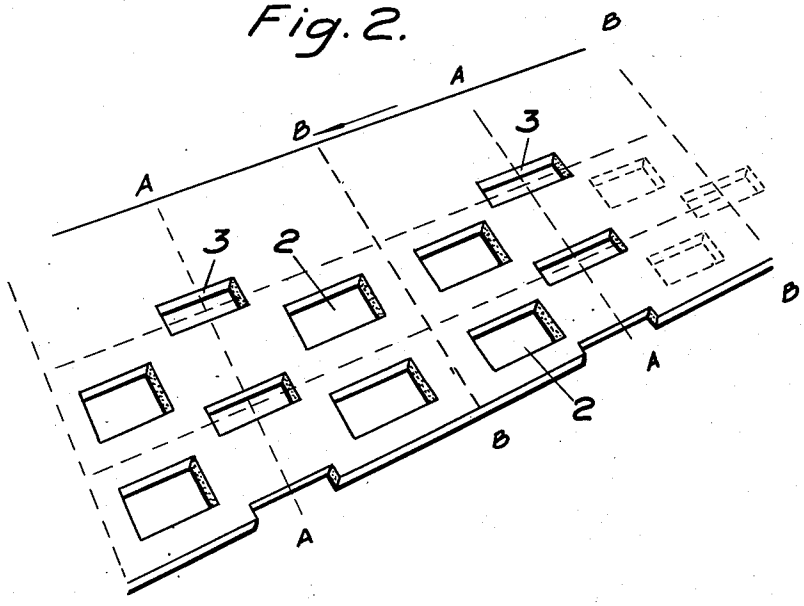


Fig. 2.



Inventor
G. B. Söderlund
By Glascock Downing & Seebold
Attys.

Jan. 12, 1954 G. B. SÖDERLUND 2,665,547

METHOD OF PRODUCING CHAIN-LINKS

Filed April 24, 1950 2 Sheets-Sheet 2

Fig. 3.



Fig. 3.a.

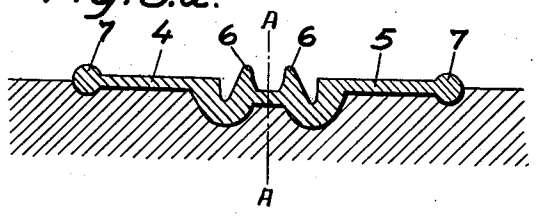


Fig. 3.b.

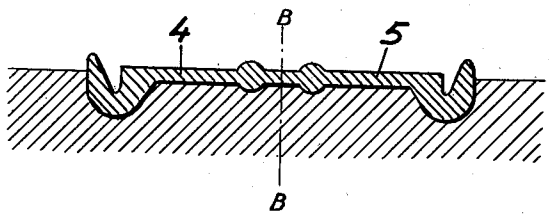
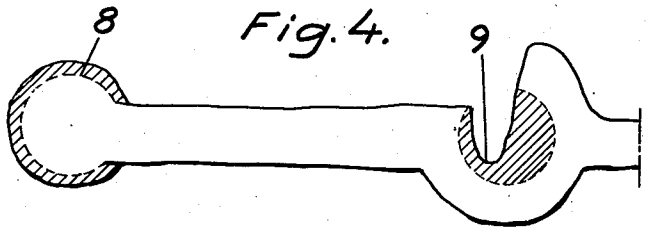


Fig. 4.



Inventor
G. B. Söderlund
By Glascock Downing & Seibold
Attys.

Patented Jan. 12, 1954

2,665,547

UNITED STATES PATENT OFFICE

2,665,547

METHOD OF PRODUCING CHAIN-LINKS

Gustav B. Söderlund, Stockholm, Sweden

Application April 24, 1950, Serial No. 157,644

1 Claim. (Cl. 59—8)

1

The present invention relates to a method of producing chain-links, particularly so-called Ewart-links.

The purpose of the invention is to create a method of producing links having higher strength values and with greater exactness than has so far been possible, so that such links may even be used in transmissions, where great demands are made to strength and to quick and silent operation.

Hitherto such links have been produced mainly according to the methods mentioned below, viz.: In the first and oldest one, the initial material is white pig iron, which is cast and annealed. The second method is to bend a piece of wire in such a manner that it forms a rectangular link. In the third method the initial material is profile-rolled steel, from which link-blanks are punched out and then cold-bent and tempered. Since no further plastic deformation of the hot ingot takes place after it has left the rollers, it is easily realized that the links must be punched out of the same in such a manner that the direction in which the stresses will act in the ready links, forms right angles with the direction of rolling and thus also with the direction of the fibers in the hot ingot, and furthermore the subsequent cold-bending of the link tongues will reduce the strength thereof still more.

These drawbacks are effectively eliminated by the use of a process according to the present invention, which is substantially characterized therein that the link-blanks are punched and cut out of a strip with preferably rectangular section in such a manner that the direction in which the stresses will operate in the ready links coincides with the direction of rolling, whereupon the link blanks are again heated and forged and, after having been subjected to ordinary annealing and hardening processes, they are subjected to mechanical working, preferably in a draw bench, so that the ready links obtain high strength values and good fit.

The invention is described in the following text with reference to the accompanying drawings, in which Fig. 1 shows diagrammatically the previous process for producing links of the kind concerned in this application in which process rolled steel constitutes the initial material. Fig. 2 illustrates how the punching and cutting takes place according to the present invention. Figs. 3*a* and 3*b* show in section two link-blanks (4, 5) undergoing the forging operation. Fig. 4, finally, shows how the contact surfaces of the links may be given an exact shape by means of a scale removing tool (for instance a broach).

2

It has been mentioned already in the preamble that the methods working with bending of wire or with casting are beset with many drawbacks, and that because in the third method the links according to Fig. 1 are cut across the direction of the fibers, the strength properties of the material cannot be fully utilized, besides which the tongue 1 must be cold-bent the least bit. On the other hand, according to the process illustrated in Fig. 2, the direction in which the draw-stresses will act in the ready links coincides with the direction of rolling, as indicated in the figure, and thus also with the grain of the material. It is also apparent from Figure 2 that a plurality of rows of spaced holes 2 are punched transversely and longitudinally of the strip and simultaneously a plurality of rows of spaced smaller holes 3 are spaced transversely and longitudinally of the strip with one row of small holes transversely positioned between pairs of transverse rows of the larger holes and with one row of small holes longitudinally positioned between adjacent longitudinal rows of the larger holes, said smaller holes being offset from the larger holes in longitudinal and transverse directions. Immediately after or simultaneously with the punching, the strip is cut transversely through the small holes to provide blocks containing a plurality of link blanks side by side and end to end with each having tongue and pin portions.

As the cutting takes place simultaneously with or immediately after the punching, the material is not at once divided into single links but in blocks containing for instance at least two links side by side and two links in length.

The above-mentioned direction of the link material relatively to the direction of rolling is made possible by a renewed heating and forging (Fig. 3) taking place after it has been rolled and punched, so that the links are given the desired section, i. e. the tongues 6 and the pins 7 are formed.

During the subsequent mechanical working, which for instance may be effected with a broach, the contact surfaces 8, 9 of the links according to Fig. 4 finally are given the exact shape which is a condition for a rapid and silent operation. The final cutting of the links (along the lines A—A and B—B in Fig. 2) is not effected until the above-mentioned operations have been accomplished. The number of links united into one block may be varied within certain limits, thus it has appeared that six to twelve links in each block is a suitable number.

It is quite obvious that this division into blocks involves great advantages. Among other, the

number of clamping and sorting operations will be highly reduced, which simplifies the manufacture of the links and reduces the costs connected therewith. It is also obvious that other working processes and machines may be used by those skilled in the art in the method of manufacture described above without abandoning the idea and the scope of the invention. Therefore, the same is only confined as disclosed in the accompanying claim.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

In the method of manufacturing chain links of the kind having tongue and pin portions with essentially cylindrical contact surfaces, the steps consisting in rolling a metal strip to preferably rectangular cross-section so that the direction in which stresses will appear in the finished links coincide with the direction of rolling, punching a plurality of rows of spaced holes transversely and longitudinally of the strip and simultaneously punching a plurality of rows of spaced smaller holes transversely and longitudinally of the strip with one row of small holes transversely positioned between pairs of transverse rows of the larger holes and with one row of small holes

longitudinally positioned between adjacent longitudinal rows of the larger holes, said smaller holes being offset from the larger holes in longitudinal and transverse directions, cutting the strip transversely centrally through the small holes to provide blocks containing a plurality of link blanks side by side and end to end with each having tongue and pin portions, reheating and press forging said blocks in order to shape a tongue and a pin portion at each blank, annealing and hardening the blocks and machining them to provide accurate contact surfaces at the tongue and pin portions and finally dividing the blocks into individual links along longitudinal lines passing centrally through said small holes and along transverse lines passing centrally between each of the rows of said pairs of rows.

GUSTAV B. SÖDERLUND.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
393,912	Locke	Dec. 4, 1888
457,583	Goldie	Aug. 11, 1891
673,747	Howe	May 7, 1901
1,670,758	Witherow	May 22, 1928