H. HOWSON.

PROCESS OF MANUFACTURING CHAIN LINKS.

APPLICATION FILED JUNE 30, 1908.

993,997.

Patented May 30, 1911.

2 SHEETS—SHEET 1.

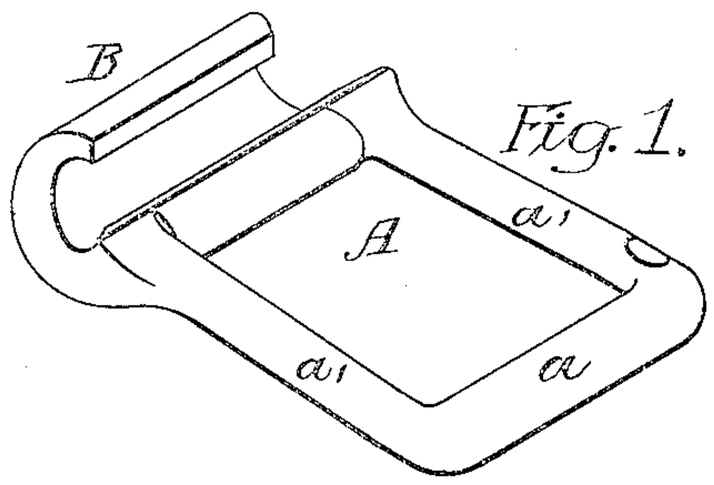


Fig. 1.

Fig. 2.

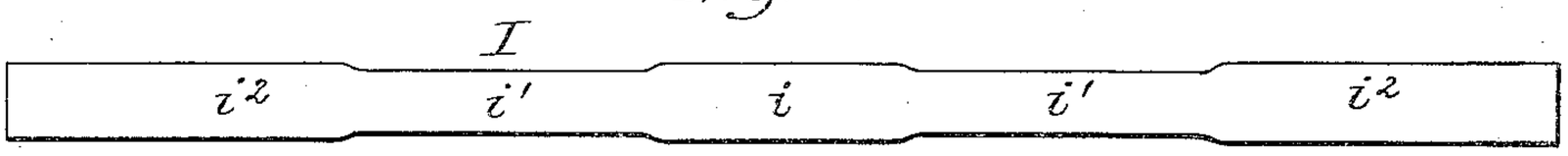


Fig. 3.

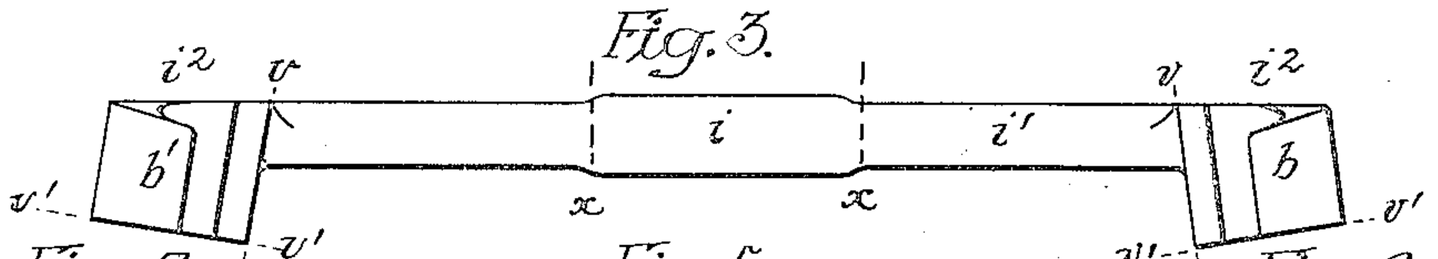


Fig. 4. Fig. 5. Fig. 6.

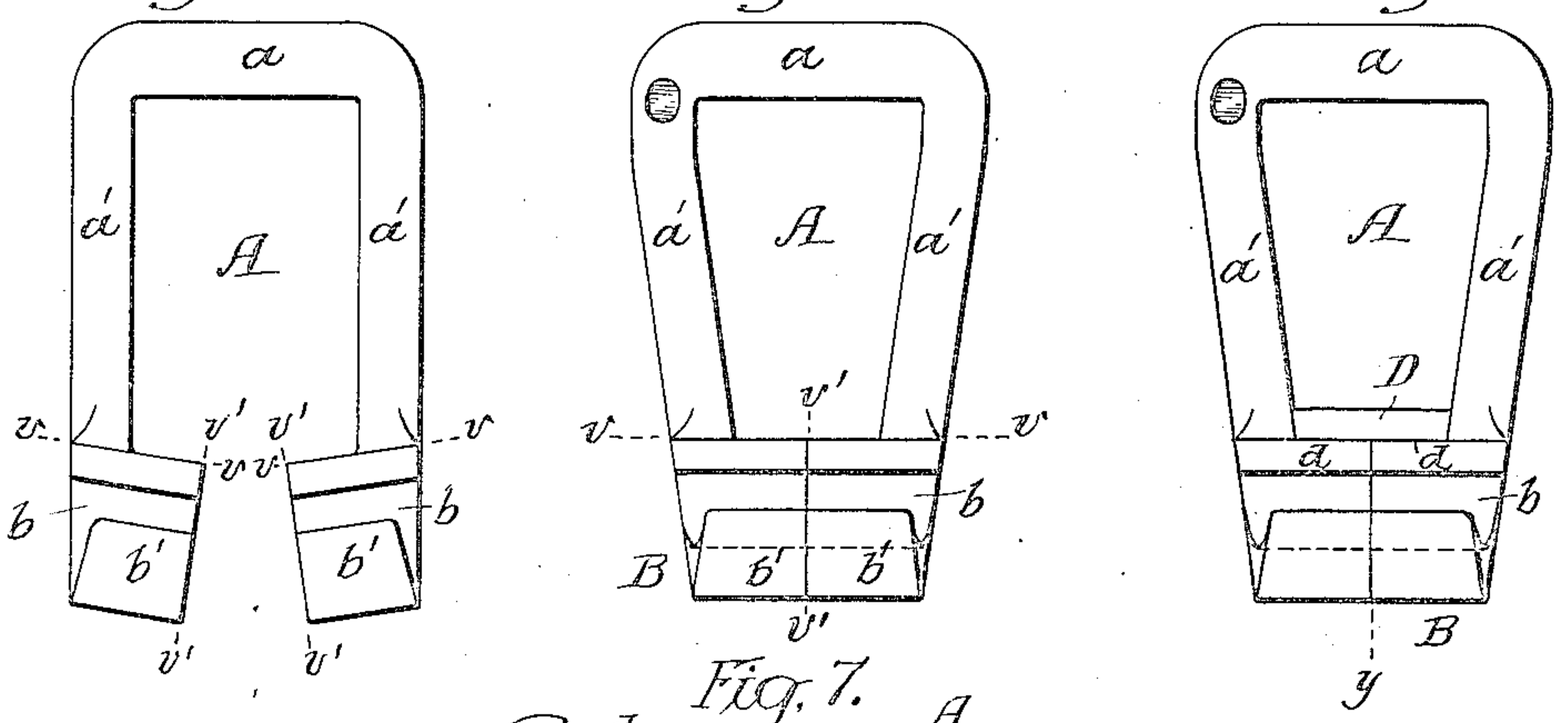
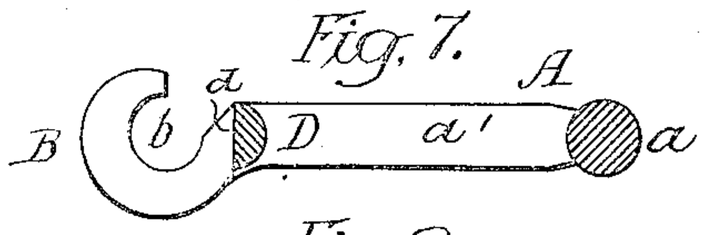


Fig. 7.



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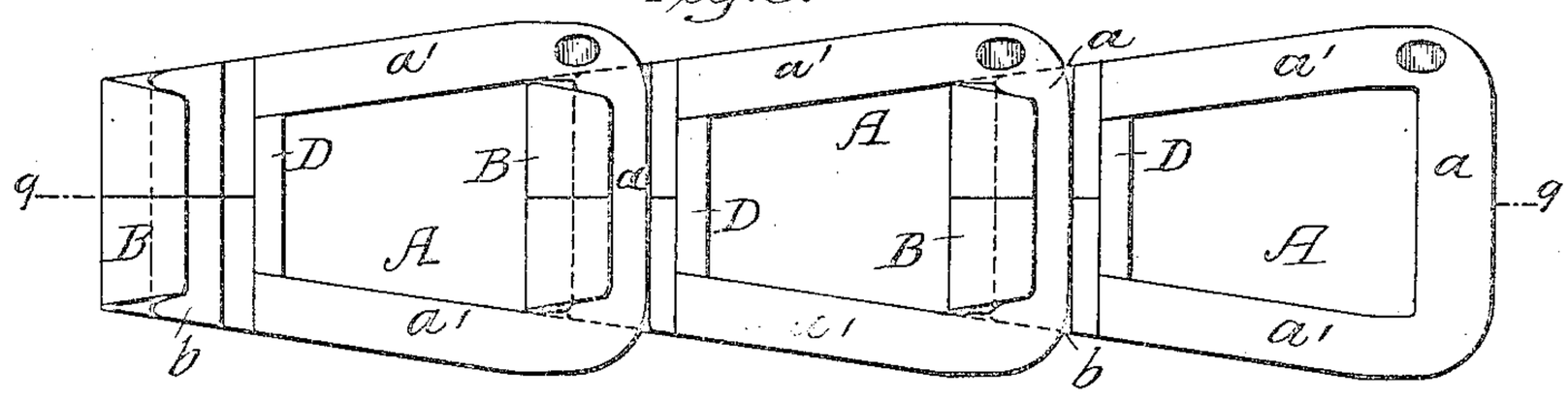
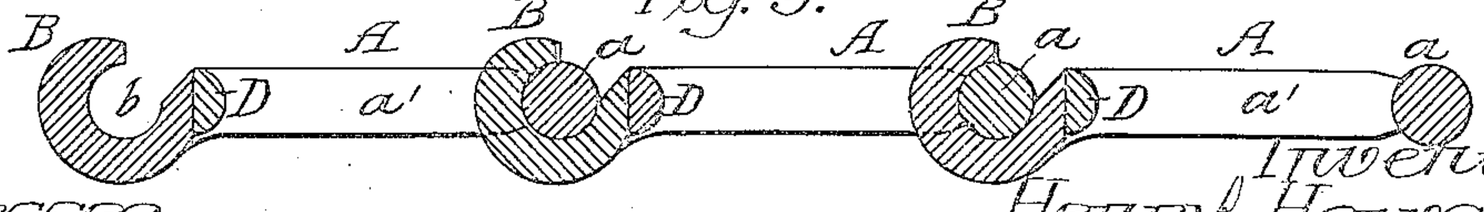


Fig. 9.



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Walter F. Sullivan

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2 SHEETS—SHEET 2.

Fig. 10.

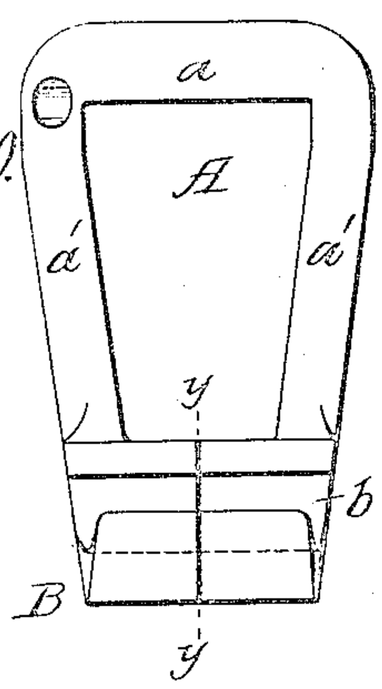


Fig. 11.

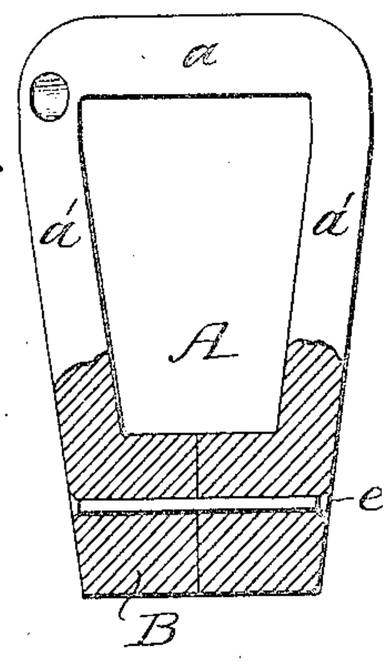


Fig. 12.

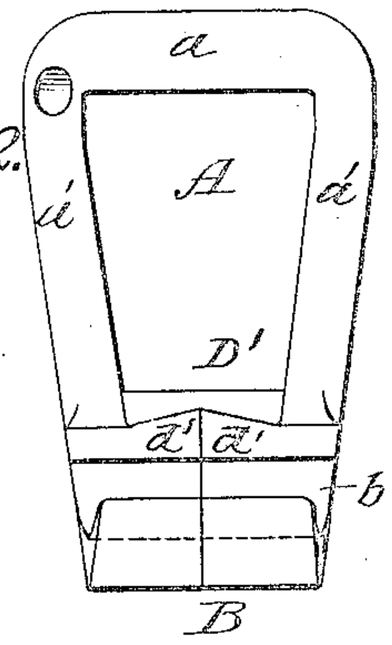


Fig. 13.

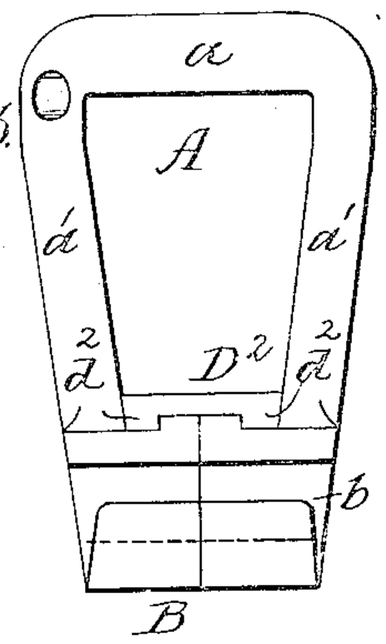


Fig. 14.

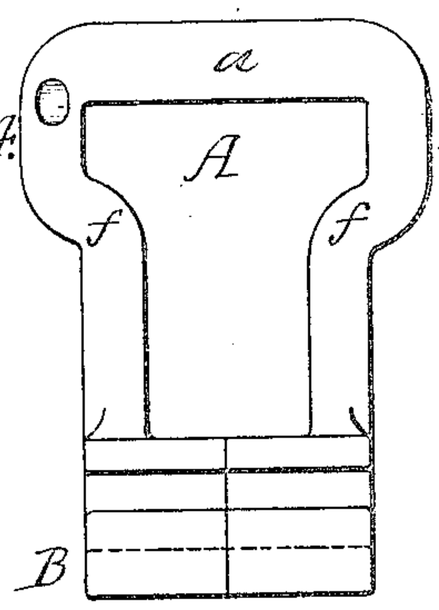


Fig. 15.

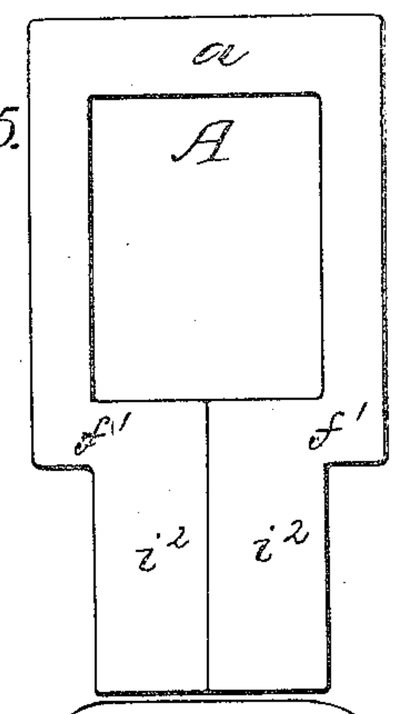


Fig. 16.

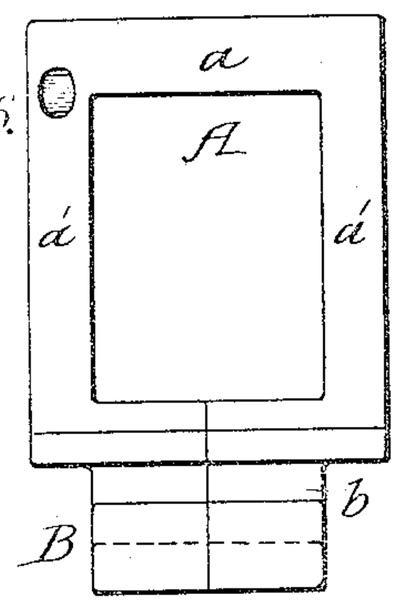


Fig. 17.

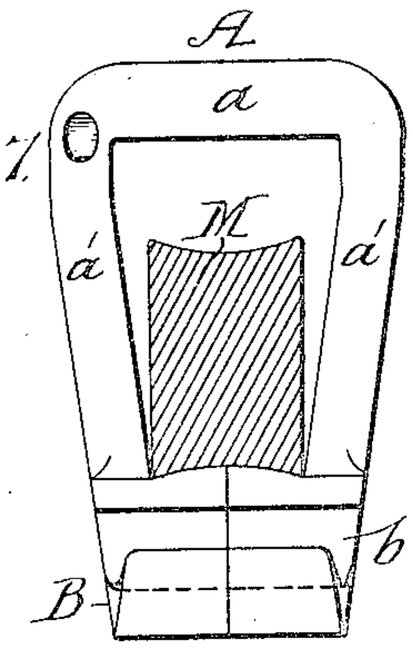
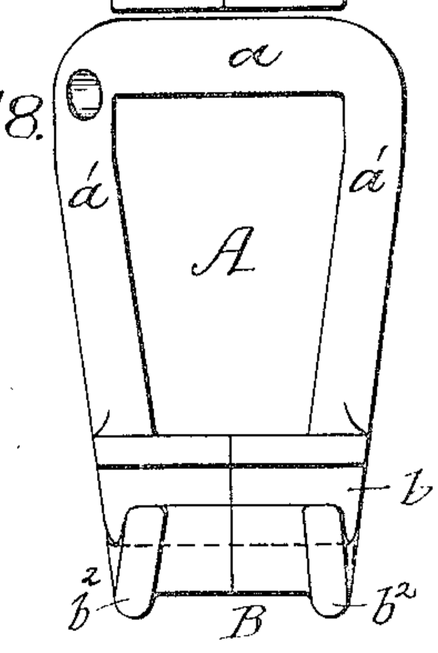


Fig. 18.



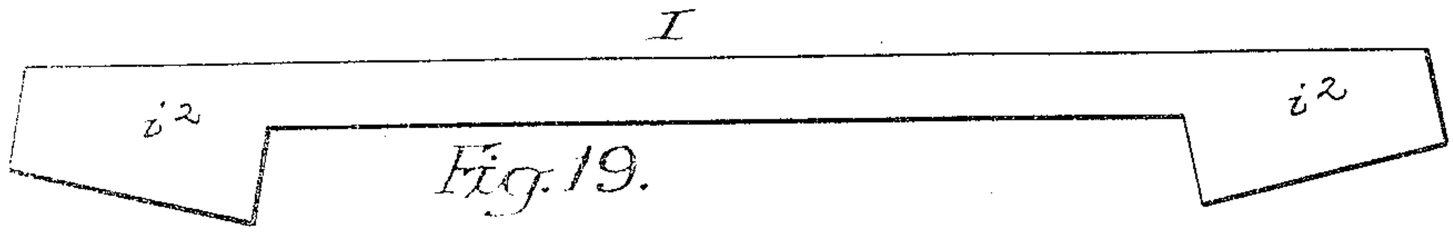


Fig. 19.

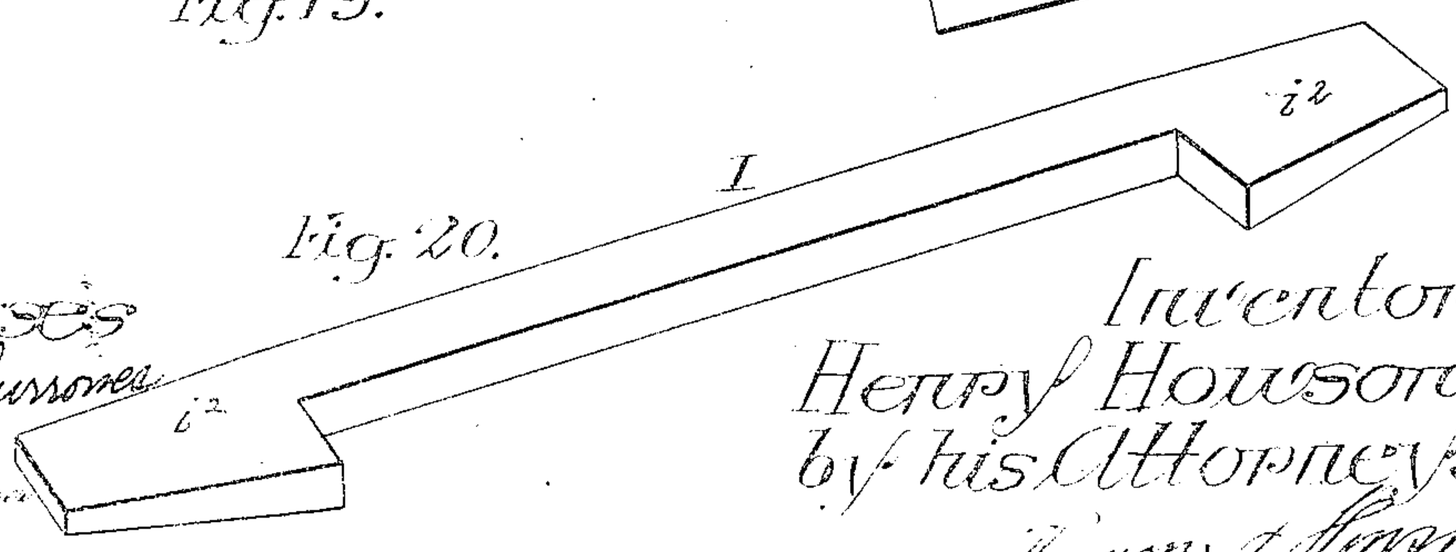


Fig. 20.

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by his Attorneys:
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UNITED STATES PATENT OFFICE.

HENRY HOWSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO LINK-BELT COMPANY, OF CHICAGO, ILLINOIS, AND PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF ILLINOIS.

PROCESS OF MANUFACTURING CHAIN-LINKS.

993,997. Specification of Letters Patent. Patented May 30, 1911.

Application filed June 30, 1908. Serial No. 441,148.

To all whom it may concern:

Be it known that I, HENRY HOWSON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Processes of Manufacturing Chain-Links, of which the following is a specification.

My invention relates to certain improvements in the process of manufacturing chain links and particularly of the type in which the links are detachably connected one to another.

The object of my invention is to improve the construction of such a link, to cheapen its manufacture and to make it much more substantial than heretofore.

In a divisional application, filed January 29, 1909, Serial No. 474,978, I claim a link that may be made by my improved process, the present application being limited to the process of manufacturing a link.

This object I attain in the following manner, reference being had to the accompanying drawings, in which:—

Figure 1, is a perspective view of the preferred form of my improved link; Fig. 2, is a view of a section of the blank from which the link is made; Fig. 3, is a view showing the upsetting process by which the ends of the blank are thickened and shaped; Fig. 4, shows the first step in bending the link into form; Fig. 5, shows the link bent into form; Fig. 6, shows the completed link with the bearing plate secured thereto; Fig. 7, is a longitudinal sectional view of the link shown in Fig. 6; Fig. 8, is a plan view showing a series of links enchained; Fig. 9, is a longitudinal sectional view on the line 9—9, Fig. 8; Fig. 10, is a view showing a link bent into shape and welded without the bearing plate; Fig. 11, shows a view of the link bent into shape and the two ends of the blank held by a transverse rivet; Figs. 12 and 13, are views of modifications of the link illustrated in Fig. 6; Fig. 14, is a view of a different form of link; Figs. 15 and 16, show another method of making the link; Fig. 17, is a view showing the face of a tooth of a sprocket wheel made to conform to the shape of the bearing portion of the link; Fig. 18, is a view showing the link with a reinforced hooked member made in accordance with my invention; Fig. 19, is a view of a modification of the blank after having its ends upset; and Fig. 20, is a view of another modification showing a flat blank.

By my invention I am enabled to manufacture a chain link from a rolled rod cut in lengths and shaped, and the two ends of the rod after being bent are secured together in any suitable manner; preferably by electric welding, although the parts may be secured together by ordinary methods of welding, or in some cases they may be simply abutted without welding, relying upon the rigidity of the material from which the link is made to hold the ends together.

There will be very little tendency for the ends of the links to spread apart as the hooked end of one link is confined by the side members at the bar end of an adjoining link.

Referring in the first instance to Figs. 1 to 9 inclusive, A is a link having a cross bar a, side members a' and a hooked portion B. The socket b in the hooked portion is of such a size as to accommodate a cross bar a of an adjoining link. This is the ordinary type of what is known as a detachable chain link. Heretofore the usual practice has been to make this chain of malleable iron, but by my improved process the chain can be made of shaped bars, preferably first rolled into proper shape, then the ends are upset and the bar is finally bent to form the link.

I preferably form the bar, from which the link is made, as shown in Fig. 2, in which I is the bar having a thick portion i on each side of which are thinner portions i' and on the extreme ends thick portions i^2. This illustrates one section of the bar which is made in any length desired and the sections multiplied. The bar can be readily formed by rolling.

In Fig. 2 of the drawings the bar is shown round in order to provide a round bar to fit the socket, the other portions of the bar may be made square or otherwise shaped according to the particular design of link desired and the size of the link, as the cross section of the members of the bar will depend considerably upon the size of the link and the strength desired. If the bar is made by rolling it is cut in the length illustrated in Fig. 2.

The ends i^2 are preferably upset into the shape illustrated in Fig. 3, or they may be upset as shown in Fig. 19. In Fig. 3 the ends are upset and the hooked members b' formed thereon, while in Fig. 19 the bar is simply upset and the hook may be formed by bending the projecting end after the link has been formed. The portion i of the blank forms the bar a of the link and when the bar is bent on the line x—x, Fig. 3, the portions i' form the side members a' of the link and the portions i^2 form the hooked member B. When the bar is bent on the line x—x, Fig. 3, it assumes the shape shown in Fig. 4, and when the bend is continued it assumes the shape shown in Fig. 6, the portions b' abutting on the line y.

In order to provide a suitable bearing for the teeth of the sprocket wheel, I preferably secure a bearing plate D to the surface d, d of the portions b' and this block is preferably secured by electric welding. The back of the block is rounded or shaped, as shown in Fig. 7, so as to form a proper bearing for the teeth of the sprocket wheel.

It will be noticed that the line of weld is in such a position that if welded by the flat process any fins formed by welding will be formed in places which will not contact with the teeth nor interfere with the working of the bar in the socket and can be readily removed by the ordinary method of removing fins.

In some instances the link may be made as shown in Fig. 5, without the ends being secured together, as the ends will be prevented from spreading, as shown in Fig. 8, by the side bars a' of an adjoining link, if there is any tendency to spread, but in order to prevent any spreading I preferably secure the ends together, either as shown in Fig. 6 by a bearing bar D, or the parts may be welded on the line y—y, as shown in Fig. 10, this line being in the direction of the strain of the link and consequently there is no tendency to part the weld and even an imperfect weld will hold the parts together.

In Fig. 11, I have shown a transverse rivet e holding the ends of the link together, while in Fig. 12, I have shown a bearing block D′ beveled in opposite directions engaging the beveled portions d' of the end sections b'.

In Fig. 13, I have shown a bearing block D^2 having projections entering recesses d^2 in the portions b'.

In Fig. 17 I have shown the bearing portions of the link curved or shaped so as to fit a curved or shaped tooth M of a sprocket wheel, so that when pressure is applied the tendency of the parts will be to move toward one another. In this type of link it is not necessary to fasten the two ends together.

In Fig. 14, I have shown a link in which the hooked end is reduced in width, the bend f, f being made at a point near the cross bar a.

In Fig. 15, I have shown a link in which the ends are bent at f', f' so as to form a quadrangular body portion, and in this figure the blank is shown bent into shape but the ends are not bent into hooked form; while Fig. 16 shows the ends bent to form the hook.

Fig. 18 shows the hooked member B provided with reinforcing ribs b^2 which add to the strength of said hook member.

It will be understood that the blank may be made either from a round bar, as shown in Fig. 2, or from a flat bar as shown in Fig. 20, or any other shape in cross section, depending upon the size of the link and the strength required.

In Fig. 20, I have shown a blank made from a plate which may be bent into shape and welded, if desired. The portion of the blank forming the cross bar in this instance may be shaped before the blank is bent into form, or after, as desired.

It will be noticed that the link illustrated in Figs. 1 and 6 is wider at the bar end than at the hook end, the hook being of such a width as to enter the space between the side members of an adjoining link, consequently the side bar is inclined from the bar to the hooked member and the double bend at the hook is thus avoided.

In shaping a blank, as shown in Fig. 3, the lines v—v are at an angle to the center line through the bar, as is also the line v'—v' of the abutting end of the enlargement, but when the bar is bent into shape, as shown in Fig. 5, the lines v—v are parallel to the center line of the bar a and the line v'—v' is at right angles to the bar.

I claim:—

1. The process herein described of manufacturing an open link, said process consisting in providing a bar of the proper length, upsetting the ends of the bar, shaping the ends to form hooked members and bending the bar on each side of the center to form a cross bar and side members, with the hooked members abutting to form the socket of the link.

2. The process herein described of manufacturing an open link, said process consisting in forming an enlargement on each end of the bar, upsetting the ends to form hooked members and bending the bar to form an open link with the hooked members abutting.

3. The process herein described of manufacturing an open link, said process consisting in providing a bar of the proper length, upsetting the ends of the bar, shaping the ends to form hooked members, and bending the bar on each side of the center to form a cross bar and side members, with the hooked members abutting, and finally electric weld-

ing the abutting hooked members to form a solid socket.

4. The process of manufacturing an open link having a hook at one end, said process consisting in forming a bar with an enlargement at each end set at an angle with respect to the longitudinal line of the bar, shaping the enlargements to form hooked members, bending the bar at each side of the center and bringing the enlargements together, making a link in which the cross bar and the hooked portion are parallel, while the side bars are at an angle one to the other, so that the link will be wider at the bar end than at the hook end.

5. The process herein described of manufacturing an open chain link, said process consisting in forming an enlargement at one side of the bar at each end thereof, shaping the enlargements to form hooked members, bending the bar at each side of the center so as to make an open link with the projections abutting, and connecting the two abutting projections by a bearing plate.

6. The process herein described of manufacturing an open chain link, said process consisting in forming an enlargement on one side of the bar at each end thereof, shaping the enlargements to form hooked members, bending the bar at each side of the center so as to make an open link with the projections abutting, and connecting the two abutting projections by a bearing plate extending from one side member of the link to the other, said plate interlocking with the projecting portions.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HENRY HOWSON.

Witnesses:
JOS. H. KLEIN,
WM. A. BARR.