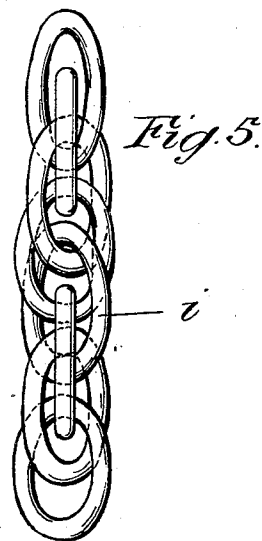
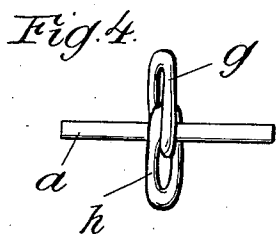
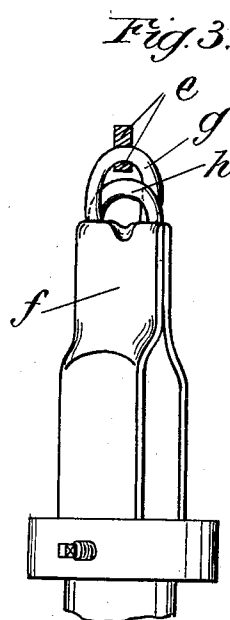
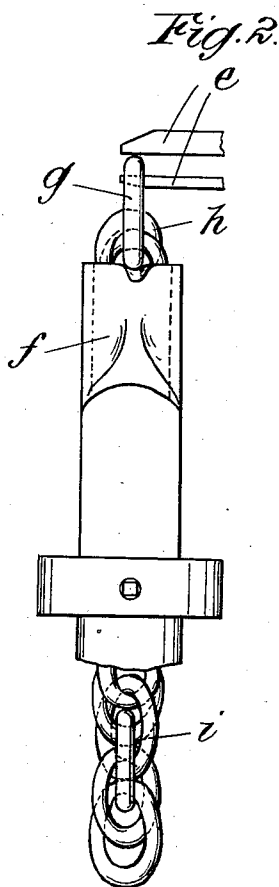
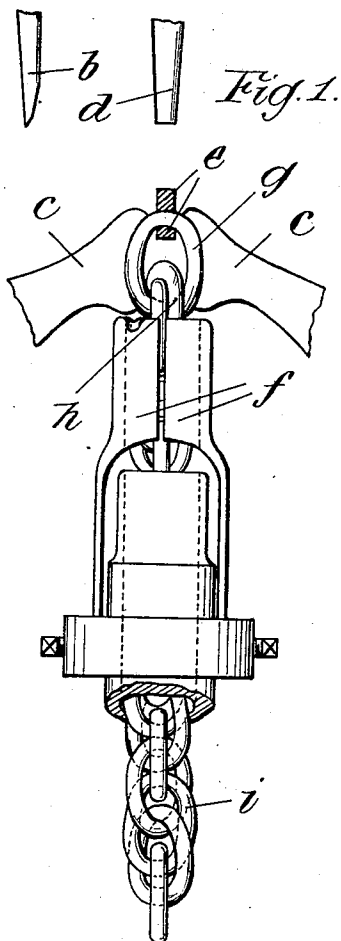


C. LEIBBRAND.
 METHOD FOR THE PRODUCTION OF MULTIPLE LINK OR CABLE CHAINS.
 APPLICATION FILED SEPT. 22, 1910.

1,011,973.

Patented Dec. 19, 1911.



WITNESSES:

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METHOD FOR THE PRODUCTION OF MULTIPLE-LINK OR CABLE CHAINS.

1,011,973.

Specification of Letters Patent.

Patented Dec. 19, 1911.

Application filed September 22, 1910. Serial No. 583,172.

To all whom it may concern:

Be it known that I, CARL LEIBBRAND, mechanical engineer, a subject of the German Emperor, and resident of Pforzheim, in the Grand Duchy of Baden, Germany, with the post-office address Brötzingenlandstrasse 14, have invented new and useful Improvements in Methods for the Production of Multiple-Link or Cable Chains, of which the following is a specification.

Heretofore it has been possible to produce by machinery only the ordinary single chains in which one link hangs upon the other in a continuous series, the multiple-link or cable chains having had to be made by putting the separate links together by hand.

The subject of the present invention is a method for enabling such cable chains to be produced by mechanical means. According to this method of manufacture the individual links are cut from a wire as usual and bent between shaping jaws, whereupon the joint of the link is worked by a small hammer-like device to make it up very firmly.

The special feature of the method of this invention is that each link which for the time being is the last to have been made in this way, is held tightly in the position in which it was produced until the preceding link of the chain has been lifted and laid upon the last link, by a turning movement, whereupon both links are turned back through an angle of about 70 degrees and thus brought into such a position that the wire which is to form the next link is enabled to pass through both links whereupon the operation is repeated.

To carry the method into practice I use a machine which, in addition to the known parts of an ordinary chain-making machine, comprises two additional pairs of tongs, one of which serves to hold the last link made, while the other surrounds the finished portion of chain and lifts the link that is for the time being the last but one, turning this link and then turning it backward together with the last link.

The accompanying drawing shows the means for carrying the method into practice, Figure 1 showing the device in front elevation, while Fig. 2 is a corresponding side elevation. In both figures all the parts are shown in the position they occupy after a

link has been finished. Fig. 3 is a front elevation corresponding to Fig. 1, showing how the last link but one is lifted and turned. Fig. 4 is a front elevation in which the last link and the preceding one are turned back again so that the wire for the next link may pass through both. Fig. 5 shows a portion, on a larger scale, of a chain produced by the method.

The wire *a* from which the links are made, is cut in the usual manner by a rising and falling knife *b* and bent into the shape of a link by a pair of jaws *c*, *d* being a jointing tool having a hammer-like action and serving to act on the joint of the link for the purpose of bringing the butt ends in close contact with one another.

The novel feature of the device consists of the horizontal tongs *e* and the vertical tongs *f*. The tongs *e*, as can be seen from Figs. 1 to 3, serve to hold each last-made link in the position in which it was produced until the link is gripped by the tongs *f*. The latter tongs *f* are adapted to rotate, are also displaceable vertically, and able to push the penultimate link upward and turn the same laterally.

When, as shown in Fig. 1, a chain link *g* has been finished, it is first of all held in its position by the horizontally mounted tongs *e*, the tongs *f* grip the penultimate link *h*, pushes it upward a little in rising, and applies it against the last link *g* by rotating it about a vertical axis, so that the two links assume the position shown in Fig. 3. The tongs *f* now also grip the last link *g* so that the tongs *e* can release the same, whereupon both links *g* and *h*, in the same relative position, are turned back again by the tongs *f* into the position according to Fig. 4. The portion of wire forming the next link now enters both the links *g* and *h* and the operation is repeated by the formation of a new link from this piece of wire. The swinging movement described by the tongs *f* has an amplitude of about 70 degrees. The tongs may of course be replaced by any other device discharging the same functions, namely, holding the last link firmly for a sufficient time, lifting the penultimate link, turning the same and turning it back again along with the last link. The finished chain *i* hangs downward inside the tongs *f*.

The actuation of the individual parts,

i. e. the cutter, jointer, jaws and both tongs, is effected as usual, from a common shaft by means of suitable cams or the like.

Now what I claim and desire to secure by Letters Patent is the following:

1. A method for producing multiple link or cable chains having a series of successively formed links, consisting in first gripping the last formed link, then lifting the next preceding link relatively to said last formed link and moving said preceding link so that it will be located in a plane registering approximately with the plane of the last formed link, then passing a length of wire for forming a new link through both said last formed link and said preceding link and then forming said wire into a complete link.

2. A method for producing multiple link or cable chains having a series of successively formed links, consisting in first gripping the last formed link, then lifting the next preceding link relatively to said last formed link, rotating said preceding link until it engages said last formed link, then

passing a length of wire for forming a new link through both said last formed link and said preceding link and then forming said wire into a complete link.

3. A method for producing multiple link or cable chains having a series of successively formed links, consisting in first gripping the last formed link, then lifting the next preceding link relatively to said last formed link, rotating said preceding link until it engages with said last formed link, then concurrently rotating said preceding link and said last formed link in a reverse direction, then passing a length of wire for forming a new link through both said last formed link and said preceding link, and then forming said wire into a complete link.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two witnesses, this tenth day of September 1910.

CARL LEIBBRAND.

Witnesses:

AUGUST OOSTERMAN,
MARIA HÄTTIG.