May 3, 1932. J. ALVERA ET AL 1,856,940

APPARATUS FOR THE PRODUCTION OF ORNAMENTAL CHAINS, SO CALLED SNAKE CHAINS

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Fig. 1.

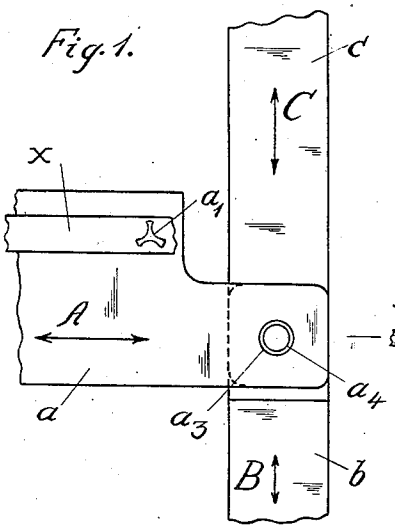

Fig. 2.

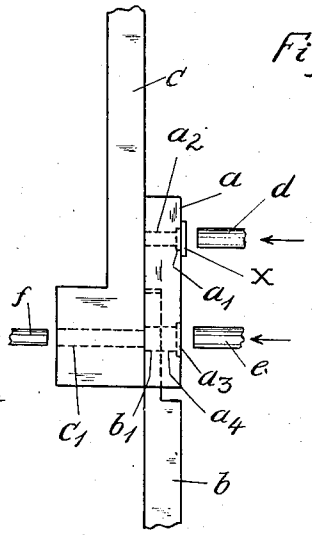

Fig. 3.

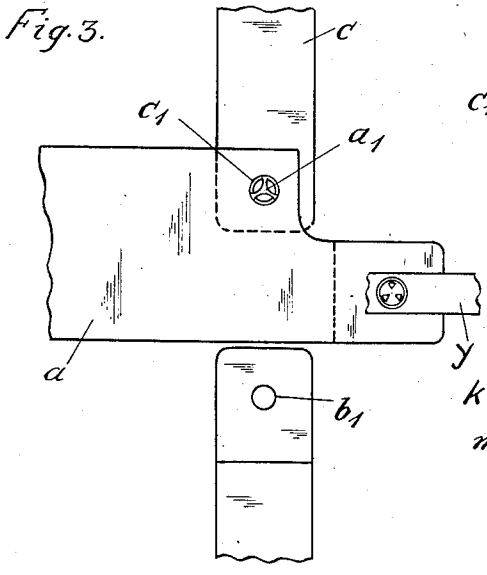

Fig. 4.

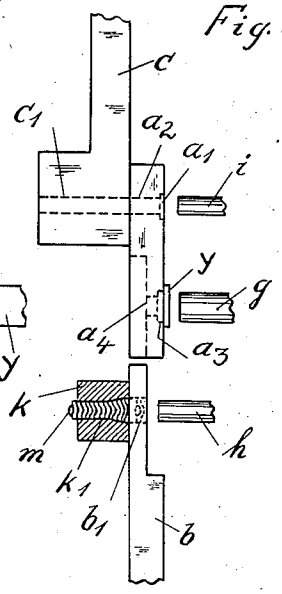

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Fig. 5.

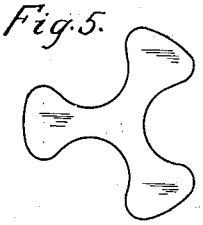


Fig. 6.

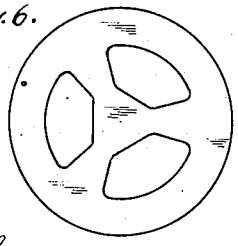


Fig. 7.

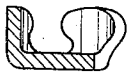


Fig. 8.

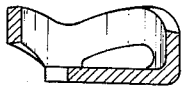


Fig. 9.

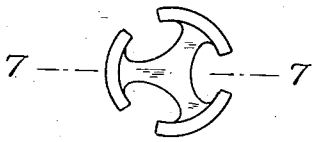


Fig. 10.

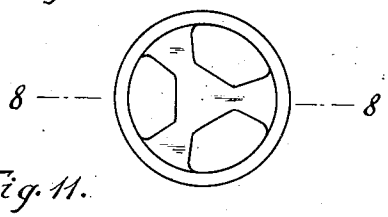


Fig. 11.

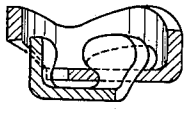
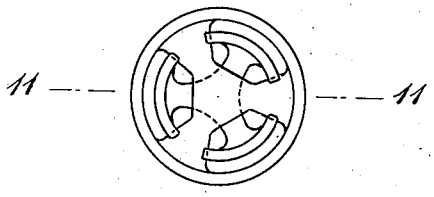


Fig. 12.



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UNITED STATES PATENT OFFICE

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APPARATUS FOR THE PRODUCTION OF ORNAMENTAL CHAINS, SO CALLED SNAKE CHAINS

Application filed August 13, 1930, Serial No. 474,982, and in Germany August 17, 1929.

Apparatus have become known for the manufacturing of so called snake chains. These chains are composed of two kinds of links, namely the casing links, which form the outer sides, and the connecting links, which connect the casing links.

The method according to the invention differs from the known methods for producing chains of this type in that two groups of tools act alternately so that the chain is made in two-cycle operation.

The new method is illustrated by way of example in the accompanying drawings in which

Fig. 1 shows the first group of tools in top plan view.

Fig. 2 being a side elevation of Fig. 1.

Fig. 3 shows the second group of tools in top plan view.

Fig. 4 being a side elevation of Fig. 3.

Fig. 5 shows the stamped blank of a connecting link in plan view.

Fig. 6 shows the stamped blank of the casing link in plan view.

Fig. 7 is a section on line 7—7 of Fig. 9.

Fig. 8 is a section on line 8—8 of Fig. 10.

Fig. 9 is a top plan view of a connecting link in finished shape.

Fig. 10 is a top plan view of a casing link in finished shape.

Fig. 11 is a section on line 11—11 of Fig. 12.

Fig. 12 shows in top plan view the two links inserted one within the other.

Both the connecting links as also the casing links are stamped in known manner from sheet metal strips. According to the method covered by the invention the stamping of the connecting link is effected in the first cycle and that of the casing link in the second cycle. The group of tools cooperating in the first cycle consists of the matrix plate a adapted to be shifted in the direction A, the feed arms b and c shiftable the one over the other in the directions B and C, the die d and the feed rams e and f. The group of tools cooperating in the second cycle consists of the matrix plate a and the feed arms b and c, together with a die g and feed rams h and i.

The production and feeding of the connecting links, which have three arms slightly enlarged at their ends, is effected in the following manner:

A sheet metal strip x is fed over the matrix plate a. In the extreme rear position of the matrix plate a (Figs. 1 and 2) the matrix hole a_1 is situated exactly under the die d, which then stamps the connecting link out of the sheet metal strip x in the first cycle. After the completion of this first cycle the matrix plate a is shifted into its extreme front position (Figs. 3 and 4), carrying along the connecting link in the matrix hole a_1. Through this displacement the matrix hole a_1 with the bore a_2 of the matrix plate comes to lie exactly over the hole c_1 of the feed arm c. During the second cycle the connecting link is pushed by the feed ram i out of the matrix hole a_1 into the bore a_2 of the matrix plate and into the hole c_1 of the feed arm c. By the pressing of the flat connecting link into the bore a_2 of the matrix plate the arms are bent up so that the connecting link assumes the shape of a tripod. In this shape it is in the hole c_1 of the feed arm c at the end of the second cycle. Only during the following cycle, which must be also regarded as a first cycle because the next connecting link is stamped out of the sheet metal strip x, the connecting of the connecting link with a casing link is effected by pushing the former into the hole b_1 of the feed arm b by means of the feed ram f, into which hole the casing link is also pushed during this cycle by means of the feed ram e.

The production and feeding of the casing link, which consists of a circular rim provided with three spokes, is effected in the following manner:

A sheet metal strip y is fed over the matrix plate a. When the matrix plate a (Figs. 3 and 4) is in its extreme front position, the matrix hole a_3 is situated exactly below the die g, which stamps the casing link from the sheet metal strip y only during the second cycle. On the completion of this second cycle the matrix plate a shifts into its rear extreme position (Figs. 1 and 2), taking back the casing link lying in the matrix hole a_3.

Through this displacement the matrix hole a_3 or the bore a_4 of the matrix plate comes exactly over the hole b_1 of the fed arm b. During the next following first cycle the casing link is pushed by means of the feed ram e out of the bore a_3 of the matrix, the circular rim being bent up into the bore a_4 of the matrix plate and further into the hole b_1, in which the connecting link is pushed at the same time from the opposite side by means of the ram f in such a manner that the free arms of this connecting link engage between the three spokes of the casing link and are securely hooked thereon by the enlarged ends of the arms.

After the completion of the first cycle the two feed arms b and c move apart from the position shown in Figs. 1 and 2 into that shown in Figs. 3 and 4. Thus the hole b_1 of the feed arm b, in which a connected pair of links is located, comes over the cone-shaped enlargement of a hole k_1 of a chain forming matrix k, into which it is pushed by means of a ram h during the second cycle of the machine. The connection of the pair of links with the length of chain m in the chain forming matrix k is effected in known manner.

In the two cycles of the device forming the entire chain producing operation, the following occurs at each cycle:

In the first cycle, in which the two feed arms b and c are situated the one above the other and the matrix plate a is in its extreme rear position, a connecting link is stamped, a second connecting link already in the feeding arm c is pushed from below by means of the ram f into the feed arm b and at the same time connected to form a pair of links with the casing link fed from above into the arm b by means of the ram e.

In the second cycle, before the commencement of which the arms b and c have moved apart and the matrix plate a has passed into its extreme front position, a casing link is stamped, a connecting link already in the matrix plate a is pushed by means of the ram i into the feed arm c and the pair of links already in the feed arm b is fed into the chain forming matrix k by means of the ram h.

The movements of the matrix plate a, the feed arms b and c, as also of the stamping dies d, g and feed rams e, f, h, i are preferably effected from one and the same cam shaft.

We claim:

1. In a snake chain making machine a connecting link feeding arm, a casing link feeding arm, a shiftable matrix plate for both the connecting links and the casing links, a ram adapted to force a stamped connecting link out of said plate into said connecting link feeding arm when said plate is in its extreme forward position, a second feeding ram adapted to force the stamped casing link out of said plate into said casing link feeding arm when said plate is in its extreme rear position, a third ram adapted to force from below the connecting link out of said connecting link feeding arm into said casing link feeding arm carrying the casing link ejected from said matrix plate by said second ram and thereby to connect the connecting link with the casing link, a chain forming matrix under said casing link feeding arm, and a fourth ram adapted to eject the pair of connected links out of said casing link feeding arm into said chain forming matrix.

2. In a snake chain making machine a movable connecting link feeding arm, a casing link feeding arm oppositely movable to said connecting link feeding arm, a matrix plate having a connecting link matrix hole and a casing link matrix hole shiftable transversely to and adapted to cooperate with said feeding arms, a chain forming matrix under one of said feeding arms, a group of tools one of which is adapted, when said feeding arms are the one above the other and said matrix plate is in pulled back position, to stamp a connecting link from a sheet metal strip and to feed this stamped blank or connecting link into the connecting link hole in said matrix plate, two oppositely moving rams of said group of tools adapted to force a previously stamped connecting link together with a casing link previously stamped from a second sheet metal strip fed over said matrix plate into said casing link feeding arm, and a second group of tools adapted, when said feeding arms have been pulled back and said matrix plate is in its pushed forward position, to force a stamped connecting link from said matrix plate into said connecting link feed arm, the arms of the casing being bent up, to stamp a casing link from the second strip of sheet metal and to force this stamped out casing link into the casing link hole in said matrix plate and to eject the previously formed pair of links from said casing link arm and feed this pair of elements into said chain forming matrix.

In testimony whereof we affix our signatures.

JOSEF ALVERA.
KARL SCHOFER.