

No. 676,078.

Patented June 11, 1901.

G. PAUL.

MACHINE FOR IMPARTING UNIFORM DIMENSIONS TO CHAIN LINKS.

(No Model.)

(Application filed Dec. 18, 1900.)

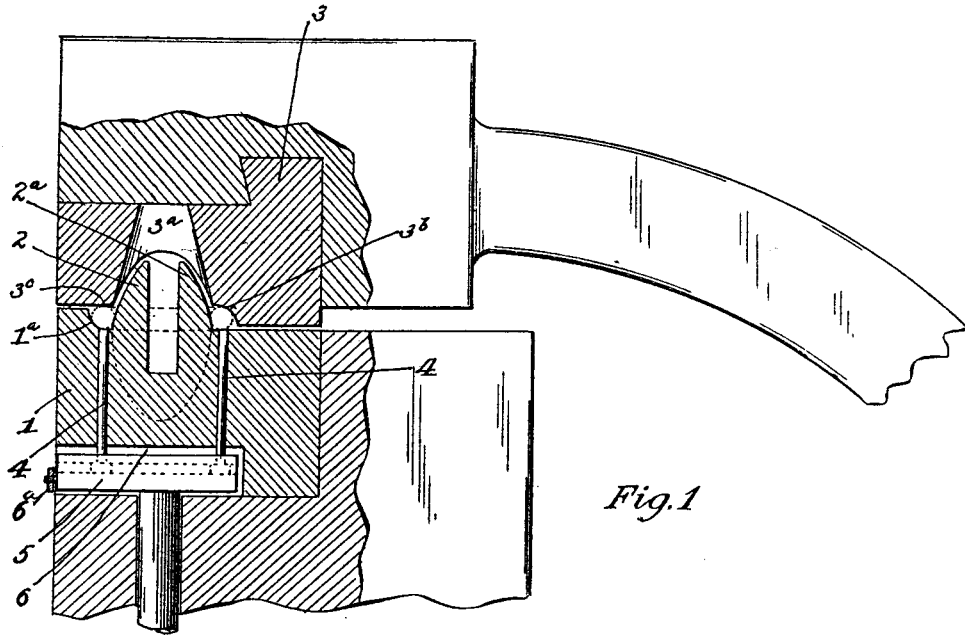


Fig. 1

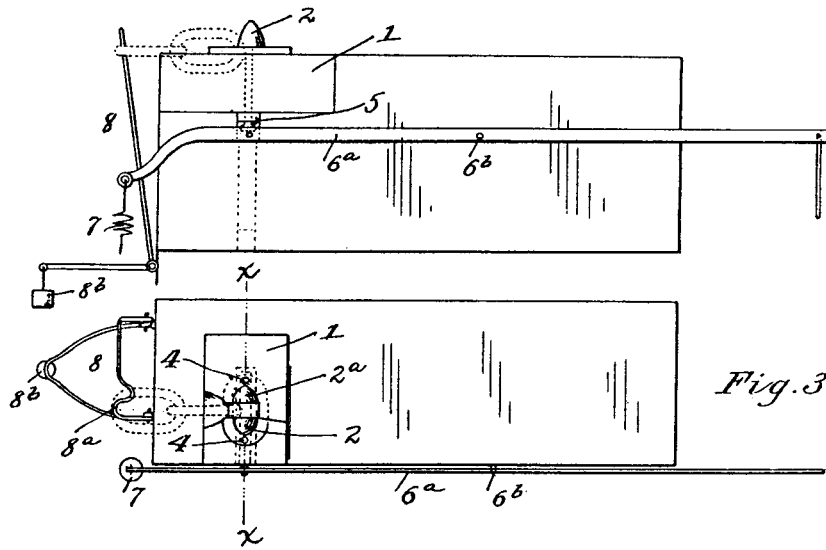


Fig. 2

Fig. 3

Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE PAUL, OF COLUMBUS, OHIO, ASSIGNOR OF TWO-THIRDS TO CHRIST PAUL AND JOHN T. CORBETT, OF SAME PLACE.

MACHINE FOR IMPARTING UNIFORM DIMENSIONS TO CHAIN-LINKS.

SPECIFICATION forming part of Letters Patent No. 676,078, dated June 11, 1901.

Application filed December 18, 1900. Serial No. 40,260. (No model.)

To all whom it may concern:

Be it known that I, GEORGE PAUL, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Machines for Imparting Uniform Dimensions to Chain-Links; and I do hereby 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.

It is necessary that links of chains used to operate or run upon pocket, sprocket, or other wheels be of uniform size and shape or of inside and outside dimensions. An attempt has heretofore been made to give uniform internal dimensions to links; but no provision has been made for imparting uniform shape to the outer sides of the link, except so far as stretching may accomplish that result. No provision has been made for shortening the links if they happen to be too long.

In the manufacture of chains of the kind referred to a rod of metal is wound in the form of spiral about a mandrel having the cross-section approximately that of the opening of the finished link. The coil is then cut into link-blanks by a diagonal slit or scarf and the arms of each blank sufficiently spread to permit it to be connected with another link. After welding together the severed ends of the link there remains a slight twist in the link, so that they do not stand at right angles to each other in the finished chain. There is not only this twist in the link, but owing to want of uniformity in winding the original rod about the mandrel and the subsequent manipulation of the link-blank some of the links are longer and some are shorter than the proper dimensions as to length.

One object of the present invention is to remove the twist and at the same time either lengthen or shorten the link, as its condition in the blank form may require.

A further object of the invention is an attachment to such a machine adapted to hold a portion of the finished chain taut while the end link is being formed to keep the finished chain from interfering with the proper operation upon the link being treated in the former.

A third object is an improved device for dislodging a sticking link from the former.

In the accompanying drawings, illustrating an embodiment of my invention, Figure 1 is a sectional view of the forming dies or devices, taken on a vertical plane indicated by the line *xx*, Fig. 3. Fig. 2 is a side elevation, hammer omitted. Fig. 3 is a plan view.

Like characters of reference in the several views designate corresponding parts.

1 designates the anvil or bed, upon which are two semiconical projections 2 and 2^a. These two projections can be made as one. Around the outer base of the forward projection 2 is a groove 1^a of approximately the shape of the link-bar at one end of the link.

3 is the upper or hammer die, formed with a recess 3^a, into which the projections 2 and 2^a enter when the hammer-die comes down on the link to be shaped. This hammer-die has a curved groove or surface 3^b, that tends, when the hammer descends upon the link, to press the metal of the link toward and around the outer side of the inner semiconical projection 2^a. The hammer-die also has a surface 3^c, that comes down on the link and tends to press the opposite end of the link toward the outer side of the outer projection 2. If the link-blank be too short when put onto the projections 2 2^a, the hammer-die will stretch it to proper internal dimensions, and if it be too long the conjoint action of the curved surfaces 1^a, 3^b, and 3^c will tend to crowd the ends of the link toward the bases of the projections 2 and 2^a, thus giving the link proper internal as well as external dimensions. As the link-shaping surfaces or the channel formed by the anvil-die and superposed hammer-die will be made to occupy one plane and as the parts will be made of hard iron or steel, the conjoint action of the parts will remove any twist in the link.

Naturally some links when cooling will tend to contract and stick upon the projections 2 and 2^a, especially if they were originally short. To dislodge such sticking links, I provide two pins 4, (one for each end of the link,) passed up through holes in the anvil, so that their upper ends will lie under the ends of the link. These pins 4 can be connected to a common holder 5, having vertical

play in a recess 6 in the anvil, and this holder 5 can be connected to and operated by a lever 6^a, hinged at 6^b on the anvil-bed. A spring 7 can be employed to hold the pins 5 down until it is necessary to dislodge a link.

When the link is being operated on in the dies or formers, it is expedient that none of the finished links shall interfere with such operation. Hence I hinge to the frame of the machine proper a supplemental bell-crank-lever-like frame 8, having at the upper end of its upper arm a projection 8^a to engage and support a link of the finished chain and at its lower arm a weight 8^b to throw the end 15 of the upper arm outward, and therefore stretch the chain. This pulls the link connected with the link being treated outward and holds it there out of position to interfere with the action of the dies on the link being 20 treated.

With this machine and the process described every link is necessarily of the same external and internal dimensions whatever may have been the faults of the link-blank. 25 Hence much trouble heretofore due to irregularities in chains intended for the uses stated will be avoided.

What I claim is—

1. In a chain-link-shaping machine, an anvil and hammer, a projection or projections 30 on the anvil to extend into the opening of the link, and surfaces on the anvil and hammer adapted to compress the link-blank toward and about said projection or projections.

2. In a chain-link-shaping machine, an anvil and hammer, a projection or projections 35 on the anvil to extend into the opening of the link to expand the same, and curved surfaces on the anvil and hammer adapted to compress the link toward and about said projection or projections. 40

3. In a chain-making machine, an anvil, a link-shaping projection or projections thereon, and dislodging-pins having their ends 45 lying adjacent the base of said projection or projections, and means to operate said pins to dislodge a link from said projection or projections.

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

GEORGE PAUL.

Witnesses:

GEO. W. ALFRED,
GEORGE M. FINCKEL.