(No Model.) 2 Sheets—Sheet 1.

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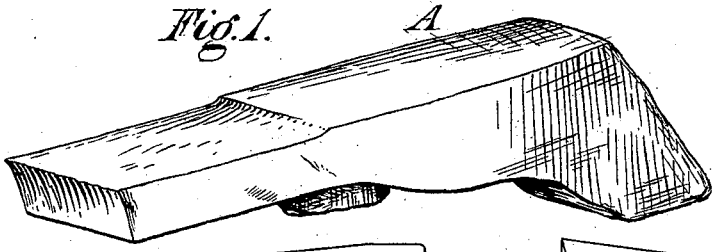
MANUFACTURE OF HOOKED COUPLING LINKS.

No. 345,080. Patented July 6, 1886.

Fig. 1.



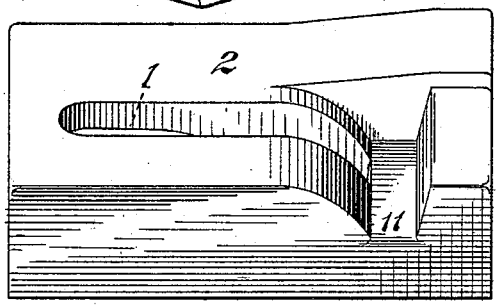


Fig. 2.

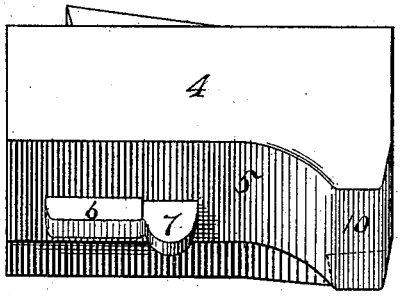


Fig. 3.

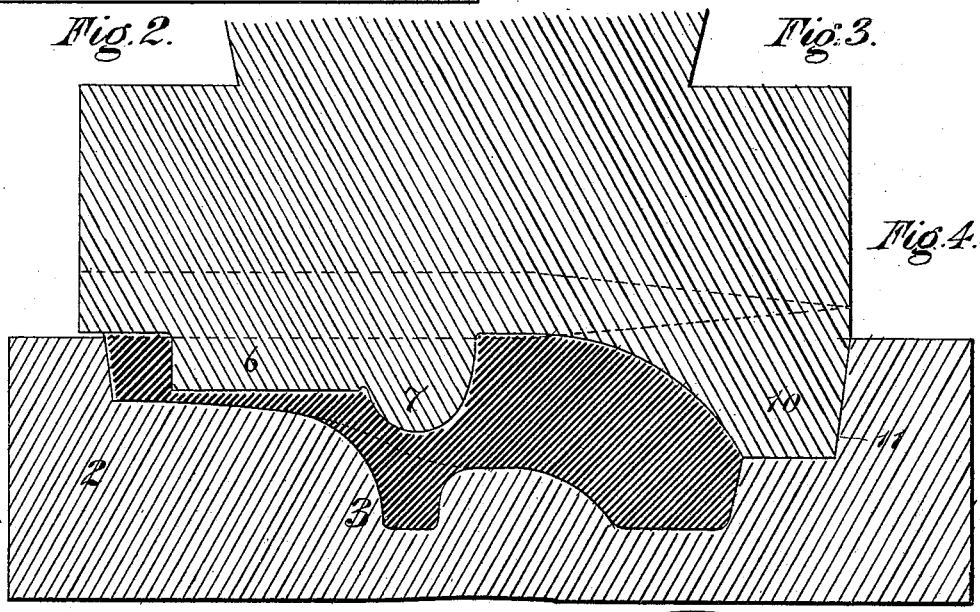
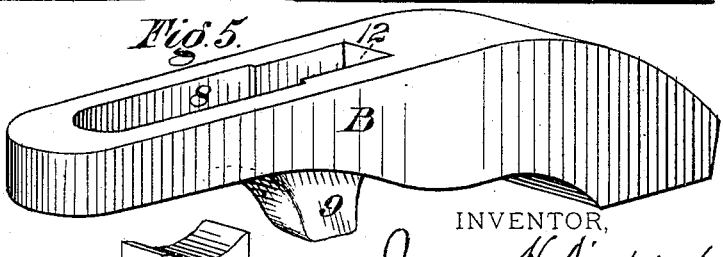


Fig. 4.

Fig. 5.



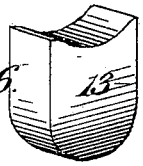


Fig. 6.

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MANUFACTURE OF HOOKED COUPLING LINKS.

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Fig. 7.

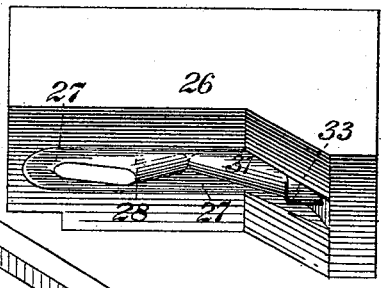


Fig. 8.

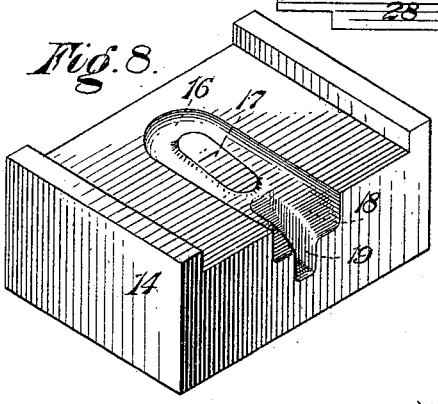


Fig. 9.

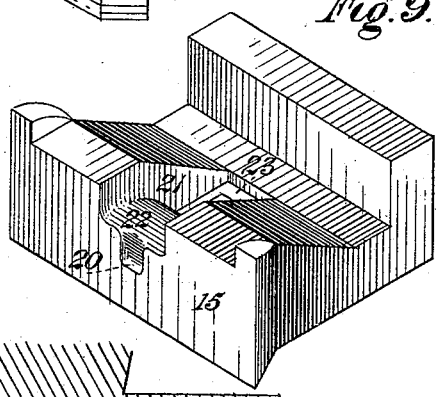
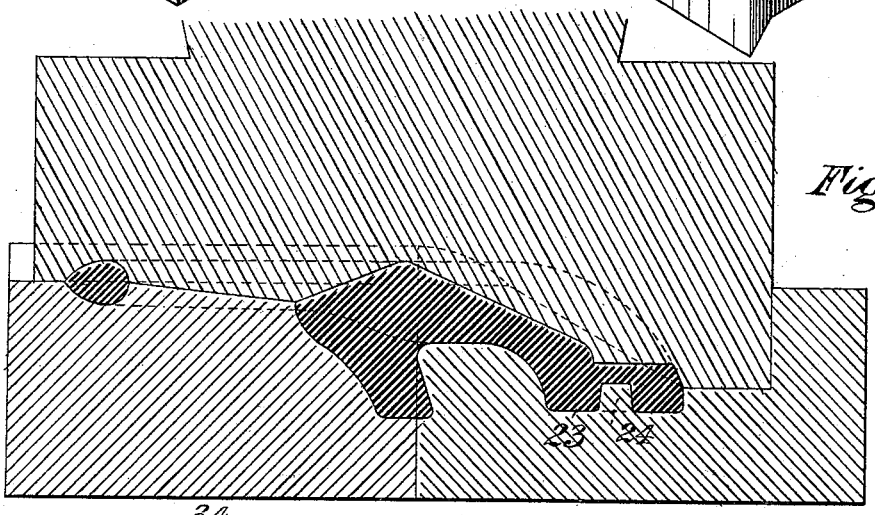


Fig. 10.



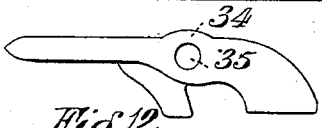
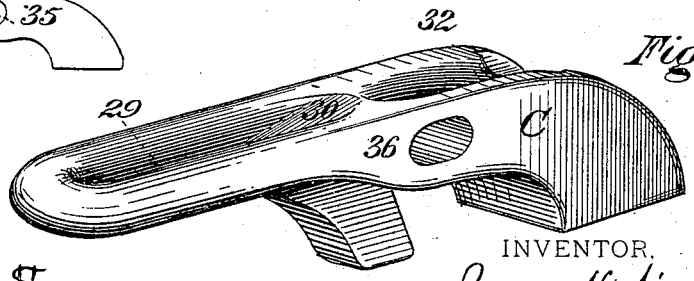


Fig. 12.

Fig. 11.



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MANUFACTURE OF HOOKED COUPLING-LINKS.

SPECIFICATION forming part of Letters Patent No. 345,080, dated July 6, 1886.

Application filed April 12, 1886. Serial No. 198,561. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. SIMPSON, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, and a citizen of the United States, have invented or discovered certain new and useful Improvements in the Manufacture of Hooked Coupling-Links, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a perspective view of a forged blank used in my improvements in the manufacture of hooked coupling-links. Figs. 2 and 3 are perspective views of what I term the "roughing-out" dies. Fig. 4 is a sectional elevation of the roughing-out dies on an enlarged scale, showing the same in operation on a blank. Fig. 5 is a perspective view of the product of the roughing-out dies. Fig. 6 is a similar view of the filling-block. Fig. 7 is a perspective view of the male finishing-die. Figs. 8 and 9 are similar views of the two parts of the female finishing-die. Fig. 10 is a sectional elevation of the finishing-dies in operation on the blank shown in Fig. 5. Fig. 11 is a perspective view of the finished hooked coupling-link. Fig. 12 is a side elevation of the blank formed in the finishing-dies.

The invention herein relates to certain improvements in the manufacture of what is known as the "Eames hooked coupling-link," whereby such parts of the link as are subjected to strain in use may be formed integral with the body of the link, thus avoiding welds, which can with difficulty be effected in steel; and to this end the invention consists in the apparatus and method, substantially as hereinafter described and claimed.

In carrying out my invention I first forge or shape in any suitable manner the block A, (see Fig. 1,) having approximately the shape of the finished link. This block, after being properly heated, is placed in the matrix 1 of the female roughing-die 2. In the bottom of the matrix 1 is formed a recess, 3, having its side walls rounded at their upper end, and gradually merging into lower wall or side of the matrix, the contour of said wall or side being substantially the same as the under side of the block A. The male die 4 has a plain operative face, 5, adapted to cover the matrix 1 when in position, and is provided near its end with the projecting punches 6 and 7. The punch 6 is of such a shape and size that when forced into the block A it will form a recess, 8, said recess being subsequently changed into a slot, as will be hereinafter described. The punch 7, which is practically a continuation and vertical enlargement of the punch 6, forces, when the die 4 is brought down, a portion of the metal of the block into the recess 3 in the female die, thus forming a projection or lug, 9, which is subsequently finished into a hook shape. The partial formation of the slot and hook are the principal functions of the roughing-out dies, although they do effect a partial rounding up or finishing of the outer surface or walls of the block, as shown in Fig. 5. The die 4 is provided with a guiding projection, 10, at one end, adapted to fit in a corresponding transverse recess, 11, in the female die 2, as shown, the inner wall of the projection being curved, so as to impart the desired contour to the tail of the block A.

As will be seen by an inspection of Figs. 4 and 5, the punch 7 forms a recess or cavity, 12, in the block B, in the rear of the recess 8, and just above the projection or lug 9, said cavity being practically a prolongation of the recess 8. Before heating the block or blank B, preparatory to its final shaping, the cavity 12 is plugged or filled by the plug 13, (see Fig. 6,) said plug being subsequently incorporated in the body of the link. After being properly heated the block or blank B is placed in the die formed by the parts 14 and 15, Figs. 8 and 9. In the face of the part or section 14 is formed a recess, 16, corresponding in outline to the link to be formed, and in this recess is located the projection 17, adapted, in connection with a corresponding projection on the male die, hereinafter referred to, to form a slot in the front end of the link. The surface of the recess between its outer walls and the projection 17 is curved, as shown, to impart a rounding surface to the under side of the link, (see Fig. 11,) and behind the projection 17 the bottom of the recess curves downward, as shown at 18, to impart the desired shape to the under side of the link. In the rear of the projection 17 a recess, 19, is formed in the section 14, said recess forming, in connection with a recess, 20, in the part 15, a cavity adapted

to cause the lug or projection 9 to assume the required hook shape.

The recess or matrix 21 in the part 15 is a continuation or a portion of the matrix 16 in the part 14, and the part 22 of the bottom of said matrix is a continuation of the downwardly-curving part 18 of the bottom of the matrix 16. At the tail end of the matrix 21 the bottom thereof is made flat, as shown at 23 in Figs. 9 and 10, from the surface of which projects the square lug 24, adapted to form a correspondingly-shaped recess in the completed link C, for the reception of a nut.

In the male die 26 (see Fig. 7) is formed a matrix-cavity, 27, of a shape corresponding to the shape of the upper side of the completed link C, Fig. 11. From this matrix-cavity projects the punch 28, constructed, in connection with the projection 17, to form the slot 29 in the completed link, and also to impart the sloping surface 30 at the end of said slot. In the rear of the punch 28 is formed another punch, 31, constructed to form a recess, 32, in the completed link, for the reception of the link-operating chain. At the rear end of this punch 31 is formed a projection, 33, having a flattened or partially-rounded operative face for forming a recess at the end of the link, for the attachment of the operating-chain. In some forms of this class of links the recess 32 is unnecessary, in which case all of the punch 31, with the exception of the part 33, is omitted.

As the rear wall of the recess 20 is undercut, so as to impart the desired hook shape to the lug 9, it is necessary to form the female finishing-die in two parts or sections, 14 and 15, in order to remove the finished link; but, if desired, the rear wall of the recess 20 may be made vertical, and the lug be bent to the required shape by a hammer after the removal of the link from the die, in which case the parts 14 and 15 are made in one piece.

A swell or enlargement, 34, is formed on the under and upper side of the blank D, Fig. 12, and a hole, 35, is bored transversely through the blank in line with said enlargements, which are forced into the body of the blank by hammers. This operation produces a flattening of the sides of the hole 35 adjacent to the enlargements 34, and an elongation in the direction of the longitudinal axis of the blank thus produces an oval opening, 36, (see Fig. 11,) which is finished by forcing an oval mandrel through the flattened hole.

I claim herein as my invention—

1. As an improvement in the art of manufacturing hooked coupling-links, the herein-described method, which consists in forming a recess in and a lug on a partially-shaped blank by stamping the same in suitably-constructed dies, and then slotting and forming a hook, and finally shaping said blank in another set of dies, substantially as set forth.

2. As an improvement in the art of manufacturing hooked coupling-links, the herein-described method, which consists in forming a lug on a suitably-shaped blank by forcing outward a portion of the metal of the blank, filling the recess or cavity produced by said operation with a metal plug, and finally shaping the lug to a hook form, and incorporating the filling-plug with the body of the blank, substantially as set forth.

3. The die 2, provided with the matrix 1 and recess 3, in combination with the die 4, provided with the projections or punches 6 and 7, the operative faces of said dies being shaped to approximately correspond with the shape or contour of the upper and under faces of the link to be formed, substantially as set forth.

4. The female finishing-die composed of the parts 14 and 15, the part 14 being provided with the projection 17 and recess 19, and the part 15 being provided with the recess 20, in combination with the male die 26, provided with the projections or punches 28 and 33, the matrices of said dies being constructed to correspond with the shape or contour of the link to be formed, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JAMES H. SIMPSON.

Witnesses:
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