

F. SPEIDEL.
CHAIN MAKING MACHINE.
APPLICATION FILED SEPT. 19, 1912.

1,054,466.

Patented Feb. 25, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

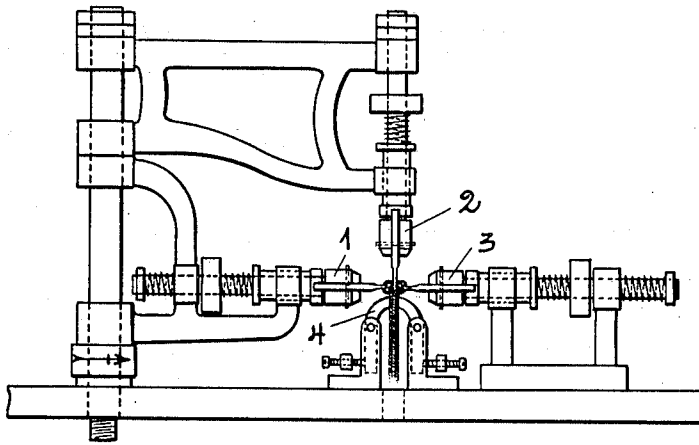


Fig. 3.

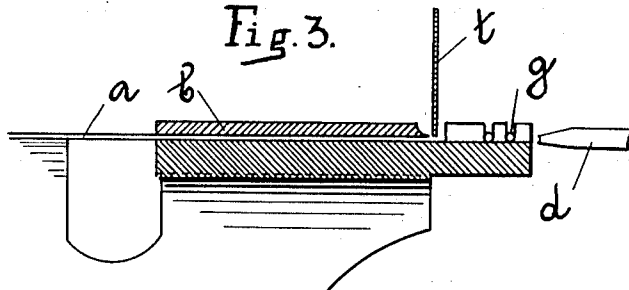
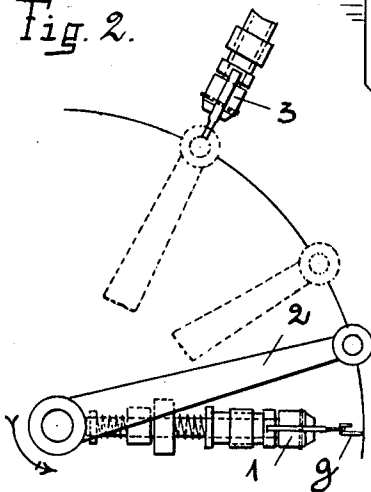


Fig. 2.



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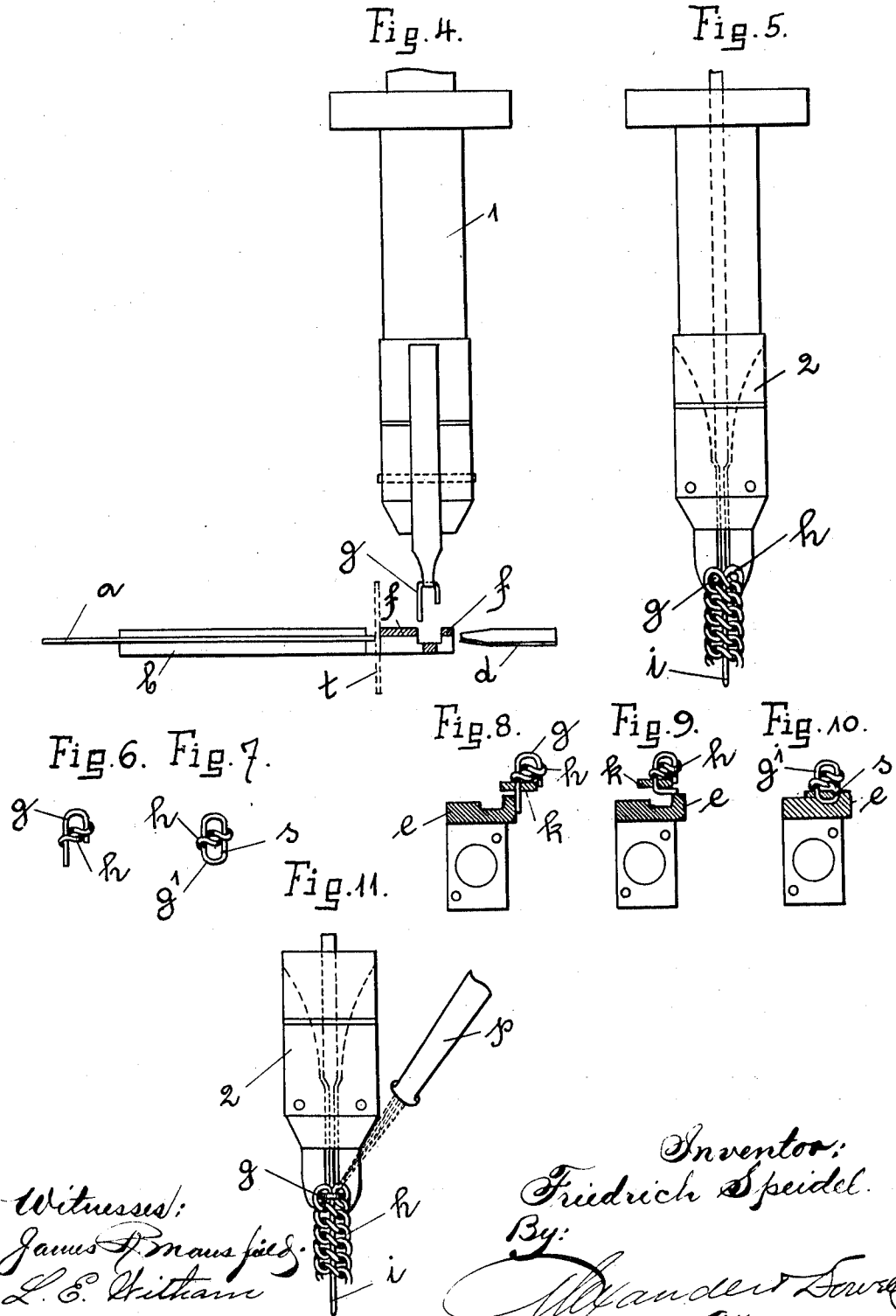
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3 SHEETS-SHEET 2.



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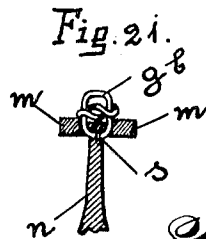
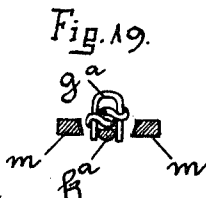
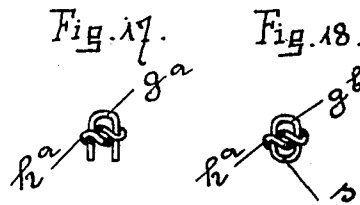
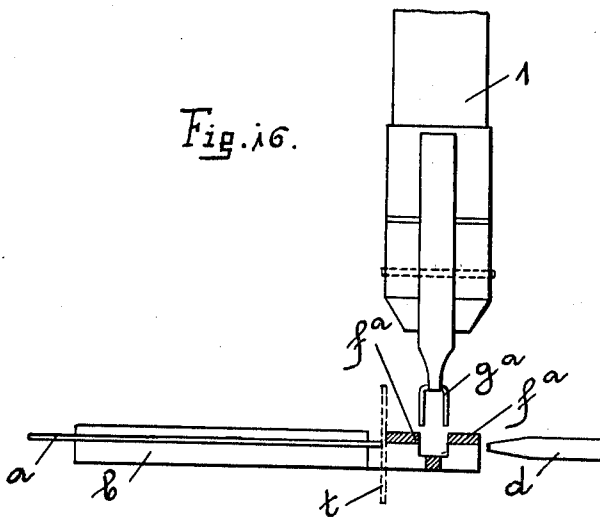
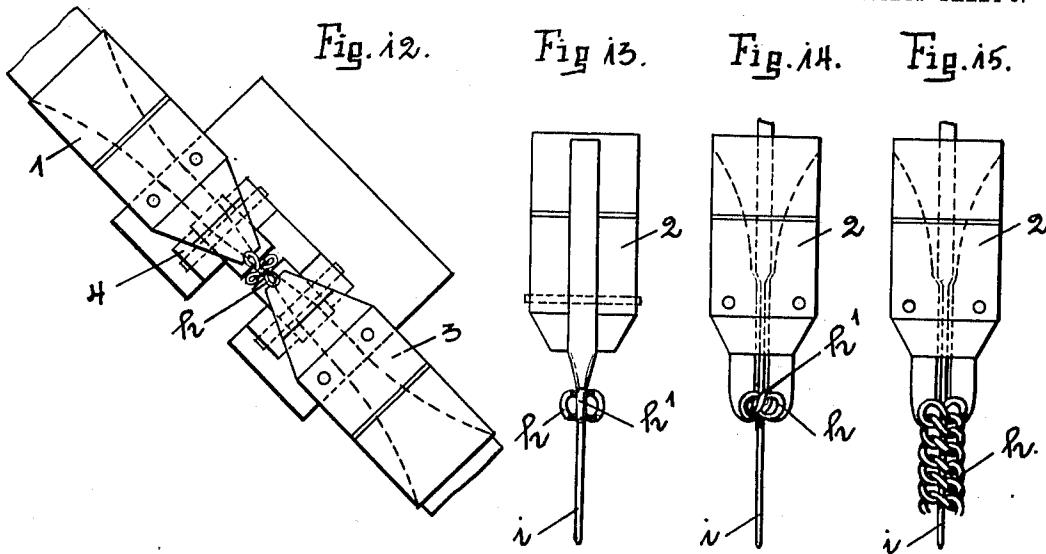
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

FRIEDRICH SPEIDEL, OF PFORZHEIM, GERMANY.

CHAIN-MAKING MACHINE.

1,054,466.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed September 19, 1912. Serial No. 721,190.

To all whom it may concern:

Be it known that I, FRIEDRICH SPEIDEL, a subject of the German Emperor, residing at Pforzheim, in Germany, have invented certain new and useful Improvements in Chain-Making Machines, of which the following is a specification.

The object of the present invention is to provide an improved machine for making chains whereof the links have the shape of the figure 8.

The invention is illustrated in the accompanying drawing in which—

Figure 1 is an elevation of the machine, Fig. 2 a plan view of part of the machine, Fig. 3 a sectional view of the preliminary blank-forming device, and Fig. 4 an elevation of this device; Fig. 5 shows a device for holding the chain during insertion of the newly formed link, and Figs. 6 and 7 illustrate the manner in which the newly formed links are inserted and joined; Figs. 8, 9 and 10 are sectional views of a presser performing part of the link-forming operation; Fig. 11 illustrates the action of a link-soldering appliance; Fig. 12 is a plan view of the appliance whereby a newly formed link is twisted in the form of a figure 8. Figs. 13, 14, and 15 illustrate the completion of the freshly inserted link. Figs. 16, 17 and 18 illustrate a modification in the manner of forming the link, Figs. 19, 20 and 21 being sectional views of a presser used in this modification.

The machine comprises a guide *b* through which the wire *a* is fed to a saw *t*, which cuts off a length of wire sufficient to form a link of the chain. The piece of wire *g* cut off (the blank) is seized by a rotatable and axially movable gripper 1 and drawn outward, in a lateral direction, between two guide-cheeks so that the wire is bent into an approximately U-shaped form; Fig. 4 shows for this purpose two guide-cheeks *f* of unequal length, whereby the blank is given limbs of unequal length. The gripper 1 then transfers the blank *g* to a second gripper 2 (Fig. 5) which holds the last of a series of previously formed links *h* in a plane perpendicular to that of the blank *g*. The gripper 1 pushes the limbs of the blank *g* through the eyes of the link *h* held by the gripper 2 as shown in Fig. 6 and the blank is bent to form an elongated link *g*¹ as shown in Fig. 7. This is effected by bending the longer limb of the blank around a shank *k*

by means of a former *e*, as shown in Figs. 8, 9 and 10. The two grippers 1 and 2, which are mounted upon a spindle, then transfer the links *g*¹ and *h* to a soldering appliance *p* (Fig. 11) by means of which the joint of the link *g*¹ is soldered. Then the grippers are swung opposite a gripper 3 (Fig. 12) which seizes the projecting part of the link *g*¹, whereupon the grippers 1 and 3 are rotated in opposite directions through 45°, whereby the link *g*¹ is twisted into the shape of the figure 8, to form a finished link *h*¹, as shown in Fig. 13. The gripper 2 then releases the link *h* which it has been holding, rotates, seizes the link *h*¹ as shown in Fig. 14, and then rotates back, so as to place the link *h*¹ in its proper position in relation to the previously formed links *h*, as shown in Fig. 15, the chain being dropped to the extent of one link. While this adjustment of the link *h*¹ is taking place the chain is held by a gripper 4 (Fig. 1). The gripper 2 has a longitudinal channel, through which is thrust a thin shank *i*, and the links are bent about this shank, so that a longitudinal central cavity is formed within the chain, to increase the mobility of the links.

As shown in Fig. 16, the wire cut off by the saw *t* may also be bent to form a U-shaped blank *g*^a with limbs of equal length. For this purpose two guide cheeks *f*^a of equal length are provided. The blank *g*^a is inserted into an 8-shaped link *h*^a, as shown in Fig. 17, and the limbs are bent together to make a central joint and form an elongated link *g*^b as shown in Fig. 18. This link is then twisted, as previously described, and the central joint need not be soldered before the twisting takes place. The bending of the limbs of equal length is performed by means of two jaws *m*, which press the limbs about a short shank *k*^a, as shown in Figs. 19 and 20, the joint being closed by means of a presser *n*, as shown in Fig. 21. The actuation of the grippers is effected by means of levers and cams in a manner well known in connection with this class of machine, the grippers being moved in one direction by the said levers and cams, and in the other direction by springs.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. A chain-making machine comprising means for bending a wire blank into U-shape, a holder for an 8-shaped link, means

for inserting the limbs of a U-shaped blank through the eyes of a link held by said holder, means for bending together the limbs of a U-shaped blank after insertion of said limbs through said eyes, and means for twisting said inserted blank to the shape of the figure 8.

2. A chain-making machine comprising means for bending a wire blank into U-shape, a holder for an 8-shaped link, means for inserting the limbs of a U-shaped blank through the eyes of a link held by said holder, means for bending together the limbs of a U-shaped blank after insertion of said limbs through said eyes, an appliance for soldering the joint made by bending together said limbs, and means for twisting said inserted blank to the shape of the figure 8.

3. A chain-making machine comprising means for bending a wire blank into U-shape, a holder for an 8-shaped link, means for inserting the limbs of a U-shaped blank through the eyes of a link held by said holder, means for bending together the limbs of a U-shaped blank after insertion of said limbs through said eyes, a shank arranged to extend between the limbs of said blank while said blank is held by said holder, and means for twisting said blank to the shape of the figure 8.

4. A chain-making machine comprising an axially movable gripper, means for bending into U-shape a wire blank held by said gripper, a second gripper adapted to seize and hold an 8-shaped link arranged so that the limbs of a blank held by said first-men-

tioned gripper can be inserted through the eyes of a link held by said second gripper, means for bending together the limbs of a U-shaped blank after insertion of said limbs through said eyes, a third gripper adapted to seize said blank after the bending together of its limbs, and means for rotating said first and third grippers in opposite directions for the purpose of twisting the blank into 8-shape.

5. A chain-making machine comprising an axially movable gripper, means for bending into U-shape a wire blank held by said gripper, a second gripper adapted to seize and hold an 8-shaped link arranged so that the limbs of a blank held by said first-mentioned gripper can be inserted through the eyes of a link held by said second gripper, means for bending together the limbs of a U-shaped blank after insertion of said limbs through said eyes, a third gripper adapted to seize said blank after the bending together of its limbs, means for rotating said first and third grippers in opposite directions for the purpose of twisting the blank into 8-shape, and a fourth gripper adapted to support the chain while the second-mentioned gripper seizes the freshly formed 8-shaped link.

In witness whereof I have signed this specification in the presence of two witnesses.

FRIEDRICH SPEIDEL.

Witnesses:

FRANZ TOPPE,
JOSEPH NEIFFER.