

UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN MACHINES FOR MAKING LINKS FOR ORNAMENTAL CHAINS.

Specification forming part of Letters Patent No. **138,413**, dated April 29, 1873; application filed September 7, 1872.

To all whom it may concern:

Be it known that I, EUGENE ISIDORE LEVAVASSEUR, engineer, residing in Paris, No. 13 Rue Gaillon, have invented certain new and useful Improvements in Machinery for Manufacturing the Links of Jewelers' Chains; and I do hereby declare that the following, taken in connection with the drawing which accompanies and forms part of this specification, is a description of my invention sufficient to enable those skilled in the art to practice it.

My improvements have reference, first, to the means of forming the links; and consist in submitting to the action of a three-fold punch strips of gold or any other appropriate metal which have been previously passed through a pair of rolls in order to receive a uniform degree of thickness, said punch performing at every descending stroke the punching out of the hollow part of a link, the rounding down its stems or sides, and finally the detaching of the link from the flattened wire, these three operations being performed simultaneously by a single descent of the punch. My improvements relate, secondly, to means for collecting together or threading these links as fast as they are turned out of the machine; but in order that my said improvements be clearly understood, I will now describe my said machine conjointly with the accompanying sheet of drawing, in which—

Figure 1 is a plan of the machine embodying the same. Fig. 2 is a vertical section through A A, Fig. 1, Fig. 3 an end elevation, Fig. 4 a longitudinal elevation, of the triple punch in section through E E, Figs. 5, 6, and 7. Figs. 5, 6, and 7, three transverse sections through B B, C C, and D D, respectively, of the same; and Fig. 8, a plan of the metallic strip, showing its conversion into links, these last five figures being in enlarged size.

The first part of my improvements—namely, the forming of the links is accomplished in this machine by means of two movements, which are, in the first place, an alternating horizontal motion for feeding forward the metallic strip out of which are cut the links; and, secondly, an alternating vertical motion actuating the punches which cut out the links.

a is the main shaft, which is set in motion by

hand, or otherwise, in the direction of the arrow, Fig. 2, and on which is mounted a cam, *b*, for feeding the metallic strip, and a cam, *b'*, for operating the punch. The metallic strip being placed in position to be fed into the machine, and the machine being set in motion, the tooth *e* causes it to advance, with each rotation of the shaft, the length of a link; to this end the cam *b* punches back the forked extremities *c c* on the upper end of the feed-lever *d* hung at *d'*, and this causes the required advancement of the strip by the impulse received from the said tooth *e*, forming the extremity of the arm *f*, articulated at *g*, to the lower extremity of the feed-lever *d*. In order to prevent, by the return of the tooth, the metallic strip being also drawn back, I make use of a second lever, *h*, the lower extremity of which is keyed on a rocking-shaft, *i*, while its upper extremity is operated by a lug, *i'*, fixed on the main shaft *a*. On the shaft *i* is firmly fixed a finger, *j*, the extremity of which rests on the under side of the arm *f*, which is maintained in contact with said finger through the pressure of the spring *k* acting on the top of said arm *f*. The spring *k* is likewise so shaped as to act at the same time on the feed-lever *d*, returning the same to its former position after each motion imparted to it by its cam *b*. It will thus be seen that after having fed the metallic strip forward under the punch, the fork *c* of the feed-lever *d* being liberated by its cam *b*, will fall forward bringing back the tooth *e* over the strip during this return stroke; and in order that the strip be not also drawn back, the arm *f* is raised by the finger *j* through the action of lug *i'* on the lever *h*. In order to regulate the length of the feed or stroke of the said lever *d*, and consequently that of the link, I make use of a screw, *l*, tapped in the feed-lever *d*, and whose point or extremity butts against the framing *m*, the length of the stroke of the tooth *e* being diminished or augmented by turning this screw either in or out; a large button, *n*, correctly divided and acted on by the spring *o*, serves to regulate this operation with the greatest precision. The holder *p* at the lower extremity of which is attached the triple instrument or punch, is elevated and lowered by the action

of the cam b' on the head-piece q . This instrument is sub-divided in three parts, the first consisting of a punch, r , which cuts out the open space in the link; the second consisting of a pair of compressing dies, $s s'$, employed for rounding off the sides or arms of the links; and the third of a cutter, t , which detaches each separate link from the metallic strip. Each link, as is thus shown, is made by means of three successive operations; but as they are all simultaneously effected on three different links at the same time, it follows that on each descent of the tool a link is completely finished and cut off.

The second part of my invention consists in the mechanism attached to the aforesaid machine for collecting or threading successively on a thin blade each link as it is successively expelled from the punches, in order to save labor by facilitating their feeding into a chain-making machine direct or after having been previously annealed. This mechanism consists in a thin blade, u , which receives a vertical alternating motion from a cam, u^1 , fixed to the main shaft a , its lower extremity being attached by a pin, u^2 , between two cheeks or sheath, u^3 . The upper extremity of this sheath is attached by a pin, u^4 to the link v , and its lower extremity slides in the eye u^5 . The link v is raised by the rod v^1 actuated by the cam u^1 , and lowered by the spiral spring v^2 , the rod v^1 traveling in fixed guides v^3 and v^4 . A spring, w is attached to the link v as well as a tumbler, y , for the purpose of causing the blade u on its upward stroke to approach the machine and enter the finished link just thrown forward by the feed motion, and on its commencing its downward stroke to retire rapidly from the

machine, drawing with it the link. For this purpose, as the sheath approaches the end of its rising stroke, the tail of the tumbler coming in contact with the pin y' fixed in the guide v^4 , turns on its center and withdraws rapidly the sheath from the machine; and it follows the motion of the link v in this position until the sheath has nearly completed its downward stroke, at which period its head, being liberated from contact with the bed of the machine, returns to its former position, whereby the spring w pushes the sheath again in contact with the bed of the machine with the blade u once more in position to enter and withdraw the link which has been made during this interval.

Having thus explained the nature of my improvements, I claim as my invention—

1. The rock-shaft i , finger j , and lever h , actuated by the cam i' , in combination with the lever d , cam b , arm f , and tooth e , for feeding the strip of metal to the cutting and shaping dies, substantially as set forth.

2. In a machine for making the links of watch-chains, the three-part punches and dies $r s t$, constructed as set forth, to punch out the center of the link, round up the edges of the metal, and to separate the link from the strip, as set forth.

3. The blade u^3 and its actuating mechanism, constructed substantially as described, and combined with the shaping and cutting dies, for receiving the complete links, as set forth.

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Witnesses:

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