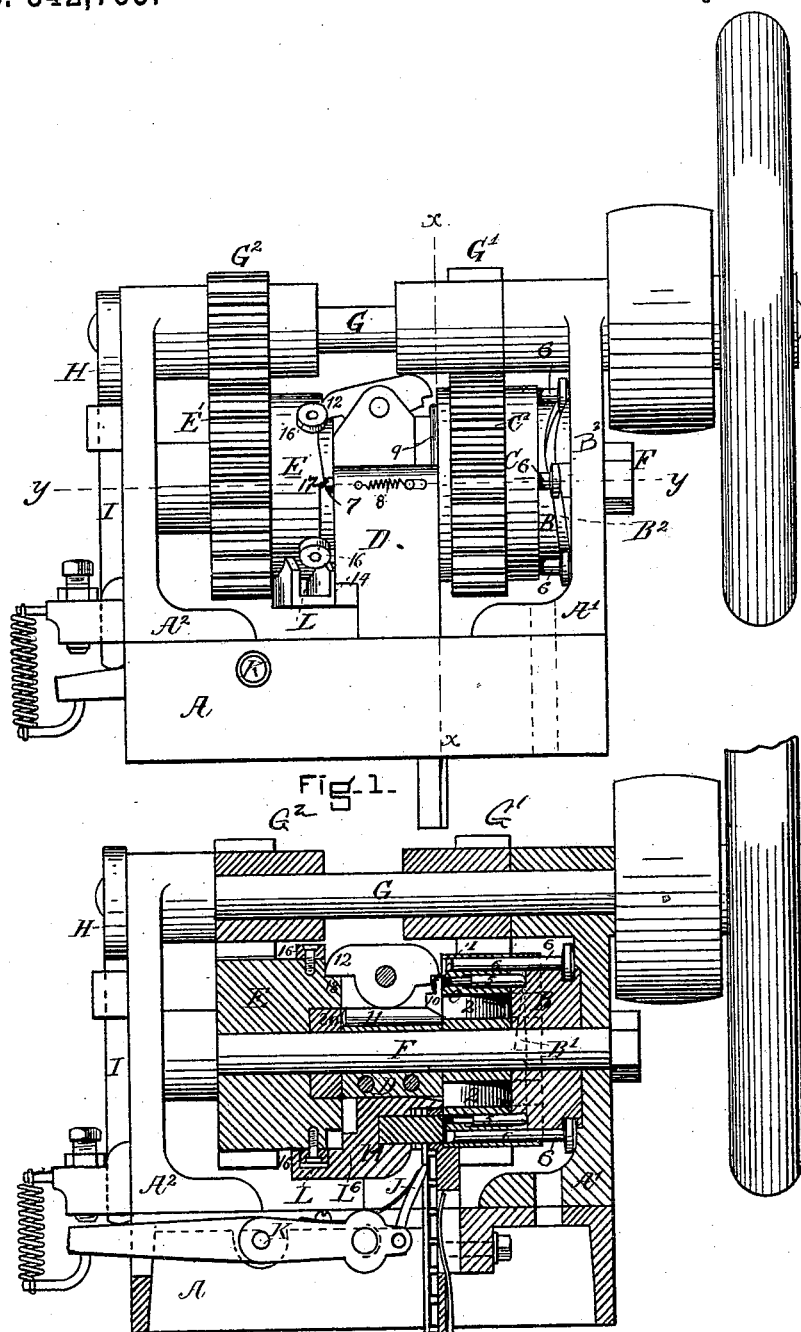


3 Sheets—Sheet 1.

MACHINE FOR MAKING SHOE LACING HOOKS.

Patented May 25, 1886.



WITNESSES

WITNESSES
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Fig- 2.

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(No Model.)

3 Sheets—Sheet 2.

J. E. CRISP.

MACHINE FOR MAKING SHOE LACING HOOKS.

No. 342,735.

Patented May 25, 1886.

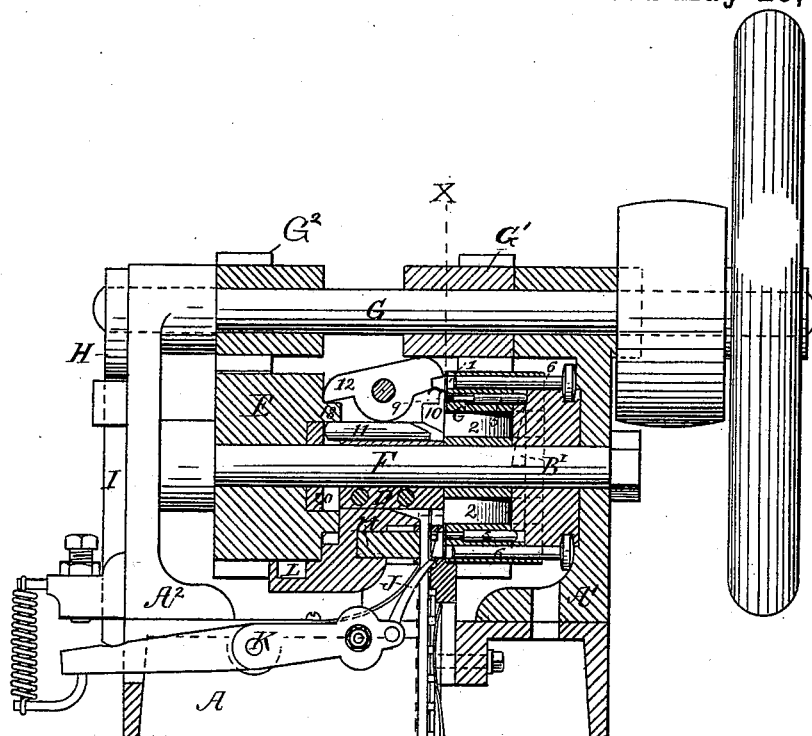


Fig. 3.

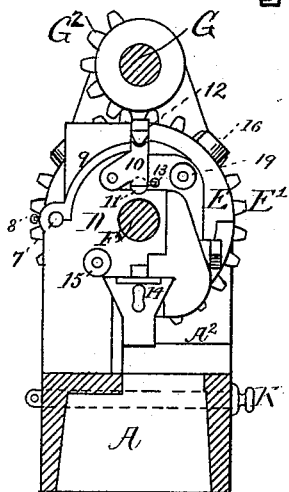


Fig-4-

WITNESSES

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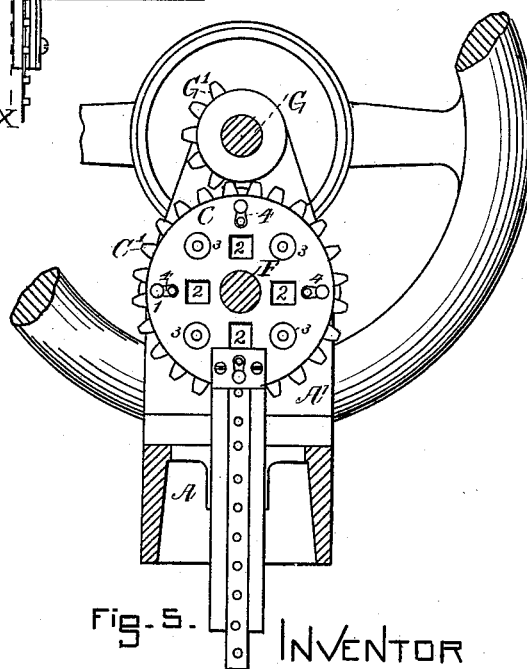


Fig. 5.

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MACHINE FOR MAKING SHOE LACING HOOKS.

No. 342,735.

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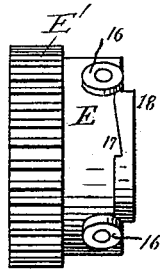
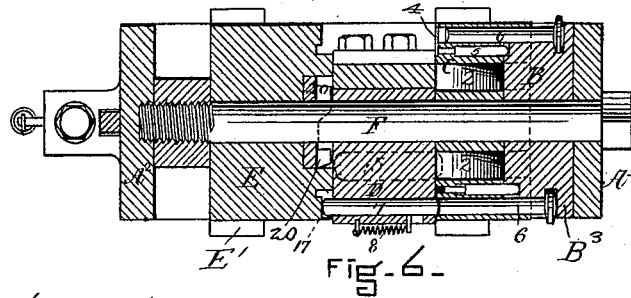


Fig. 7-

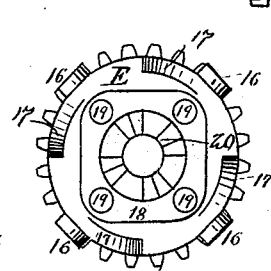


Fig. 8-

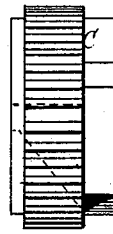


Fig. 9-

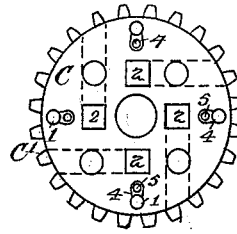


Fig. 10-

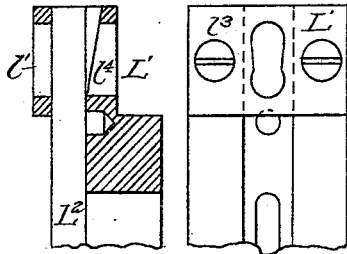


Fig. 11-

Fig. 12-

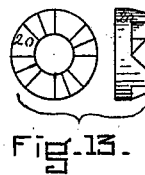


Fig. 13-

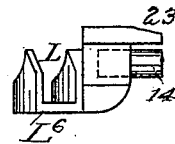


Fig. 14-

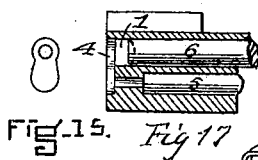


Fig. 15-

Fig. 17-



Fig. 16-

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UNITED STATES PATENT OFFICE.

JOSEPH E. CRISP, OF SOMERVILLE, MASSACHUSETTS.

MACHINE FOR MAKING SHOE-LACING HOOKS.

SPECIFICATION forming part of Letters Patent No. 342,735, dated May 25, 1886.

Application filed June 21, 1883. Serial No. 98,819. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. CRISP, of Somerville, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Machines for the Manufacture of Shoe-Lacing Hooks, of which the following is a full, clear, and exact description.

My invention relates to machines for making shoe-lacing hooks of the turret class.

My invention consists, mainly, of such a machine having a turret and cam-wheel mounted upon a common center-pin, and driven by a suitable mechanism with an intermediate tool-holder; but the invention also consists in various details of construction, which are all hereinafter fully set forth and claimed.

In the accompanying drawings, Figure 1 represents a side elevation, and Fig. 2 a vertical longitudinal section, of the machine. Fig. 3 is section similar to Fig. 2, showing the tools ready for action. Fig. 4 is a cross-section showing in elevation the face of the tool-holder. Fig. 5 is a cross-section showing in elevation the face of the turret; and Fig. 6 is a section on line *yy* of Fig. 1. Fig. 7 is a side elevation, and Fig. 8 a front elevation, of the cam-wheel. Fig. 9 is a side elevation of the turret, and Fig. 10 a front elevation of the same. Fig. 11 is a cross-section, and Fig. 12 a plan, of the cutting-die. Fig. 13 shows both a face view and side elevation of the cam-ring. Fig. 14 is a side elevation of the male die and cam for operating the same. Fig. 15 is a plan of the blank when cut from the strip; and Figs. 16^a, 16^b, 16^c, and 16^d represent several forms which the blank assumes under the successive operations of the tools from the time when cut from the strip until it becomes the finished blank. Fig. 17 is a detailed sectional view of a portion of the turret, showing the passages therein for the tool-holders and for forming the blanks.

The frame is composed of a base, A, and standards A' A², which support a driving-shaft, G, one end of said driving-shaft supporting the balance-wheel and band-pulley, which turns the said shaft, and the other end an eccentric, H, which gives vertical movement to a bar, I, sliding in guides on the standards A², this bar serving to actuate the feed mechanism in connection with coiled springs

(shown in Fig. 3) in the ordinary manner. The central pin or shaft, F, supports the stationary cam B, a turret, C, a tool-holder, D, and cam-wheel E, and this pin can be removed when it is desired to get out any of these parts for any purpose. The feed mechanism can be disconnected by withdrawing the pin K. (Shown in Figs. 1 and 2.) The cam B is held to the standard A' by pins in its face, or in any suitable manner. The turret C and the cam-wheel E each have peripheral gearing, which is adapted to engage with the mutilated gears G' G² on the shaft G. These gears move these parts alternately a quarter-turn, and the eccentric H is so arranged and constructed that it gives movement to the feed mechanism to move the feed-plunger J forward when the turret is in motion and back when the cam-wheel is in motion.

The turret C is provided with passages 2, arranged about its central opening, which serve to discharge the waste material, these passages being inclined as shown, so that as the turret revolves they form inclined chutes and discharge the waste from the machine. Adjacent to these passages are passages 1, arranged equally distant from each other, and these passages carry the matrices 6, hereinafter fully described. Intermediate between the passages 1 and the passages 2 are passages 5, which contain the ejectors for removing the finished hook. The front of the turret, at the entrance to the passages 1 and 5, is cut out, as shown in Figs. 10 and 17, in the shape of the blank shown in Fig. 15, and this recess (marked 4) is adapted to receive the blank while it is being worked upon by the forming-tools. Between the position of the recesses 4 are countersinks 3, which, as shown, are adapted to receive the corresponding end of a bolt, 15, in the tool-holder, which thus holds the turret in accurate position while the forming-tools are working upon the blank.

The tool-holder D supports the double-ended bolt 15, (shown in Fig. 6,) and which, as heretofore described, registers alternately with countersunk portions of the turret C, and also with similar countersinks in the cam-wheel E, (indicated at 19 in Fig. 8,) and serves to keep the said turret and cam-wheel in proper position during their alternate action.

In a recess in the face of the tool-holder

nearest the turret C is arranged the female die L'. This die has a central passage, L', through which the stock passes from which the lacing-hooks are formed, this stock being shown in position in Fig. 2. It is, as shown, provided with the eyelets, and when in position within the female die L' is ready to be acted upon by the male die, which cuts the blank from the stock in the shape shown in Fig 15. In the rear of the opening in the female die is a similar opening, l', which is adapted to receive the eyelet in the stock succeeding that which is to be cut out by the male die. The plate l' over the upper part of the female die (shown in Figs. 5 and 12) serves to prevent the metal from being bent when the male die is being withdrawn. The cutting-face of the female die is shown by the line l', which is, as shown, at an angle to the passage through which the stock is fed, and this forms what is termed a "shear," as, when the male die operates upon the stock and the cutting-edge of the female die it commences to cut at one end and cuts along the angular line, thus allowing the blank to pass with certainty into the recess 4 of the turret. The extreme outer end of the female die also forms one side of a shear, which cuts off the waste remaining after the blank has been cut, and this is discharged, as heretofore described, through the inclined passage 2 of the turret.

The male cutting-die, which acts in conjunction with the female die described, is shown in Figs. 2, 3, 4, and is indicated at 14. This die is carried in a holder, L⁶, which is actuated back and forth by wheels 16 on the cam-wheel E, acting upon a cam-groove, L, in the said holder, as shown in the various figures heretofore referred to. The male die 14 is of the same shape as the opening in the female die, and is, as heretofore described, adapted to pass through the same and cut out the blank. As shown in Fig. 14, above the male die 14 is supported one part of a shear, 23, which acts in connection with the extreme edge of the female die to cut off the waste and discharge it into the chute 2 of the turret. After the action of the male and female dies the blank is left cut in proper shape within the recess 4 of the turret-face, with the eyelet of the said blank held in the passage 5 of the said turret. The blank is then ready to be acted upon by the matrices and the tools acting in connection therewith.

In Fig. 6 is shown the tool 7, which is adapted to be operated upon by the cam 17 of the cam-wheel E to form the convex portion of the blanks, as hereinafter described. A spring, 8, (shown in the same figure,) serves to retract the punch after it has performed its work.

The tool-holder has a raised bead or corner, 9, as shown in Figs. 1 and 4, which serves to assist in bending the blank into an L form. An anvil, 10, (shown in Fig. 4,) is pivoted to the face of the tool-holder, and has an inclined

lower face to one side of its pivot, which is operated upon by a bolt, 11, which has a wedge-shaped face, and this bolt is operated upon at the proper time to lift the anvil by the high parts of a cam, 20, secured around the hub of the cam-wheel E. The blank is bent around this anvil. A vibrating lever, 12, is pivoted upon the holder D, as shown in Figs. 1 and 2, and this lever, acted upon by the parts 18 of the cam-wheel E, as shown in Figs. 2, 7, and 8, serves to finish the bending of the hook over the anvil, as shown in Fig. 2.

The cam B, which is stationary, is provided with a cam-groove, B', in which groove the roll ends of the matrices 6 work, and the action of this cam-groove in the revolution of the turret causes the matrices in the proper action of the machine to first move up to the blank held within the recess 4, and stop upon the beginning of the high part of the cam-groove, where it receives the blow of the punch 7, which forms the concavo-convex head of the lacing-hook, the end of the punch 7 being of convex, and the end of the matrix 6 of concave, shape. In the continued movement of the machine the high part of the cam-groove is reached, which causes the matrices to pass out through the face of the turret, and bend the indented end of the blank out of the recess 4, and at right angles over the corner 9 of the tool-holder, the eyelet of the blank being all the time held firmly in the passage 5. In the further movement the cam-groove recedes, and the matrices are drawn into their normal position. The hook is bent into the proper shape from that shown in Figs. 3 and 16' to that in 2 and 16' by the vibrating lever 12 forcing it down over the anvil 10, when it is ready to be discharged by the ejectors in the passages 5, which ejectors are operated upon by the inclines B' on the cam B.

The various movements are imparted to the operating-tools contained and supported by the tool-holder by the cam-wheel E, the wheel 16 on its periphery operating the male die through the groove L, the incline 17 operating the punch 7, the cam-track 18 operating the pivoted lever 12, and the cam 20 (shown in Fig. 13 in detail) operating the bolt 11. These movements are so timed that the tools perform the labor required at different degrees of revolution, so that there will not be excessive strain upon the driving mechanism.

The parts of the machine are all of proper size and of ordinary material.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of a turret, a cam on the same shaft therewith, an intermediate tool-holder also arranged on the same shaft, and suitable operating mechanism, substantially as described.

2. The combination of a turret having recessed face, said recesses corresponding to the shape of the blank, a female die adapted to

register with the recesses in the turret-face, a male die adapted to cut out the blanks, and to force them into the recesses in the said turret, and means for operating the parts, substantially as described.

3. The combination of a revolving turret having recessed face, punch mechanism, substantially as described, adapted to punch out the blanks and deliver them to the recessed turret-face, mechanism for cutting off the waste, said turret also having passages through it for the discharge of the waste, substantially as described.

4. The combination of a turret having recessed face, mechanism, substantially as described, for cutting out the blanks and delivering them into the said recesses, matrices contained in the turret adapted to operate on one side of the blanks, a tool-holder, and a punch contained in said holder adapted to operate upon the blank in connection with the matrix in the turret, substantially as described.

5. The combination of a turret having recessed face, mechanism, substantially as described, for cutting out the blanks and delivering them into the said recesses, matrices contained in the turret adapted to operate on one side of the blank, a tool-holder, a punch contained in said holder adapted to operate upon the blank in connection with the matrix

in the turret, and mechanism for bending the end of the blank, substantially as described.

6. The combination of a turret having recessed face, mechanism, substantially as described, for cutting out the blanks and delivering them into the said recesses, matrices contained in the turret adapted to operate on one side of the blank, a tool-holder, a punch contained in said holder adapted to operate upon the blank in connection with the matrix in the turret, mechanism for bending the end of the blank, and mechanism for ejecting the finished blank, substantially as described.

7. A machine for making lacing-hooks, consisting of mechanism for feeding the stock to the punching mechanism, mechanism, substantially as described, for punching the blank out of the stock fed thereto, mechanism for cutting off the waste, a turret having recesses in its face adapted to receive the blank from the punching mechanism, mechanism, substantially as described, for forming a concavo-convex head upon the blank, mechanism for bending the blank, mechanism for finishing the blank, and mechanism for ejecting the blank, substantially as described.

JOSEPH E. CRISP.

Witnesses:

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OSCAR LAPHAM.