

(No Model.)

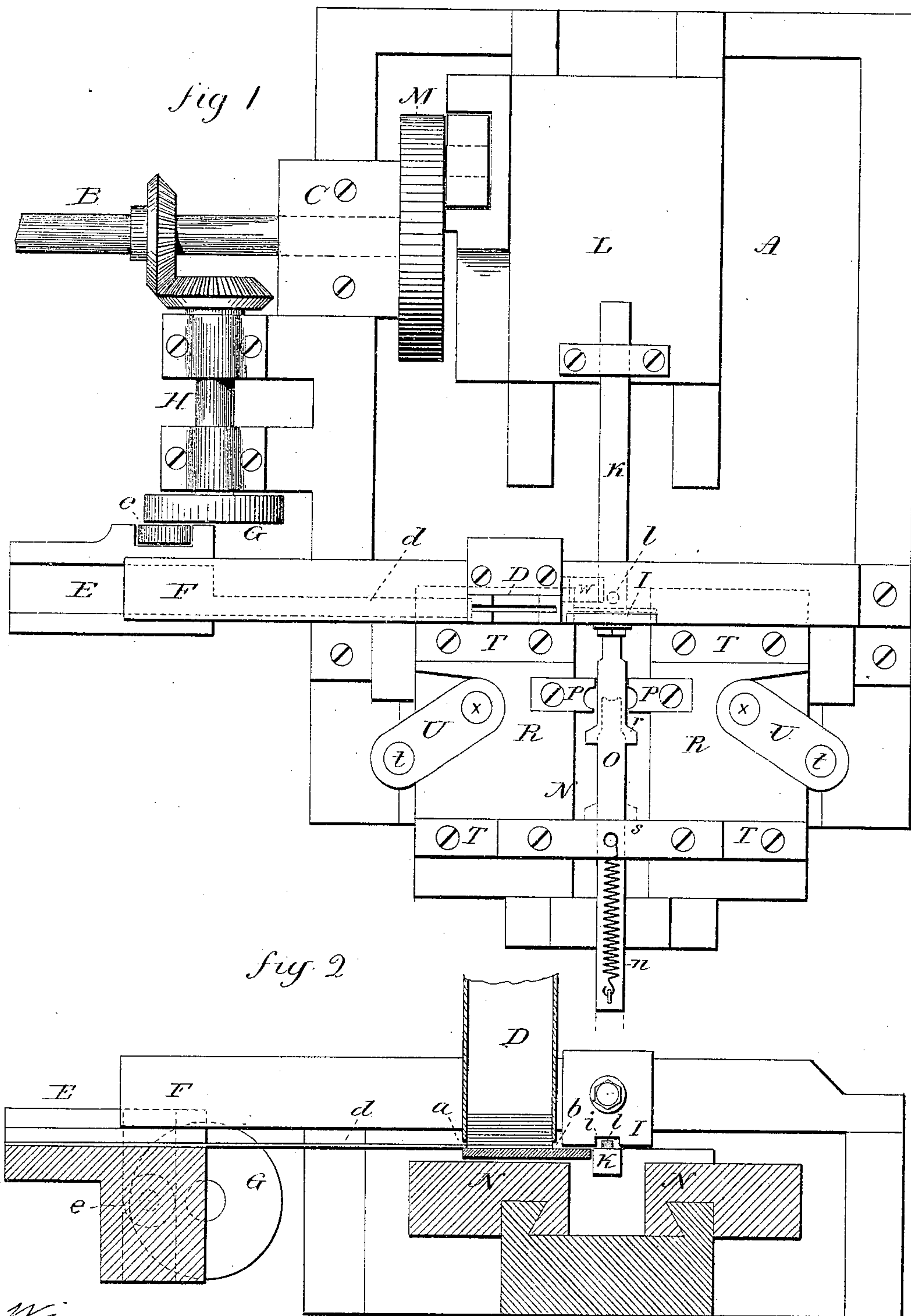
2 Sheets—Sheet 1.

E. A. ALPRESS.

MACHINE FOR BENDING SCREW HOOKS AND EYES.

No. 270,362.

Patented Jan. 9, 1883.



Witnesses.

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By atty. Inventor.

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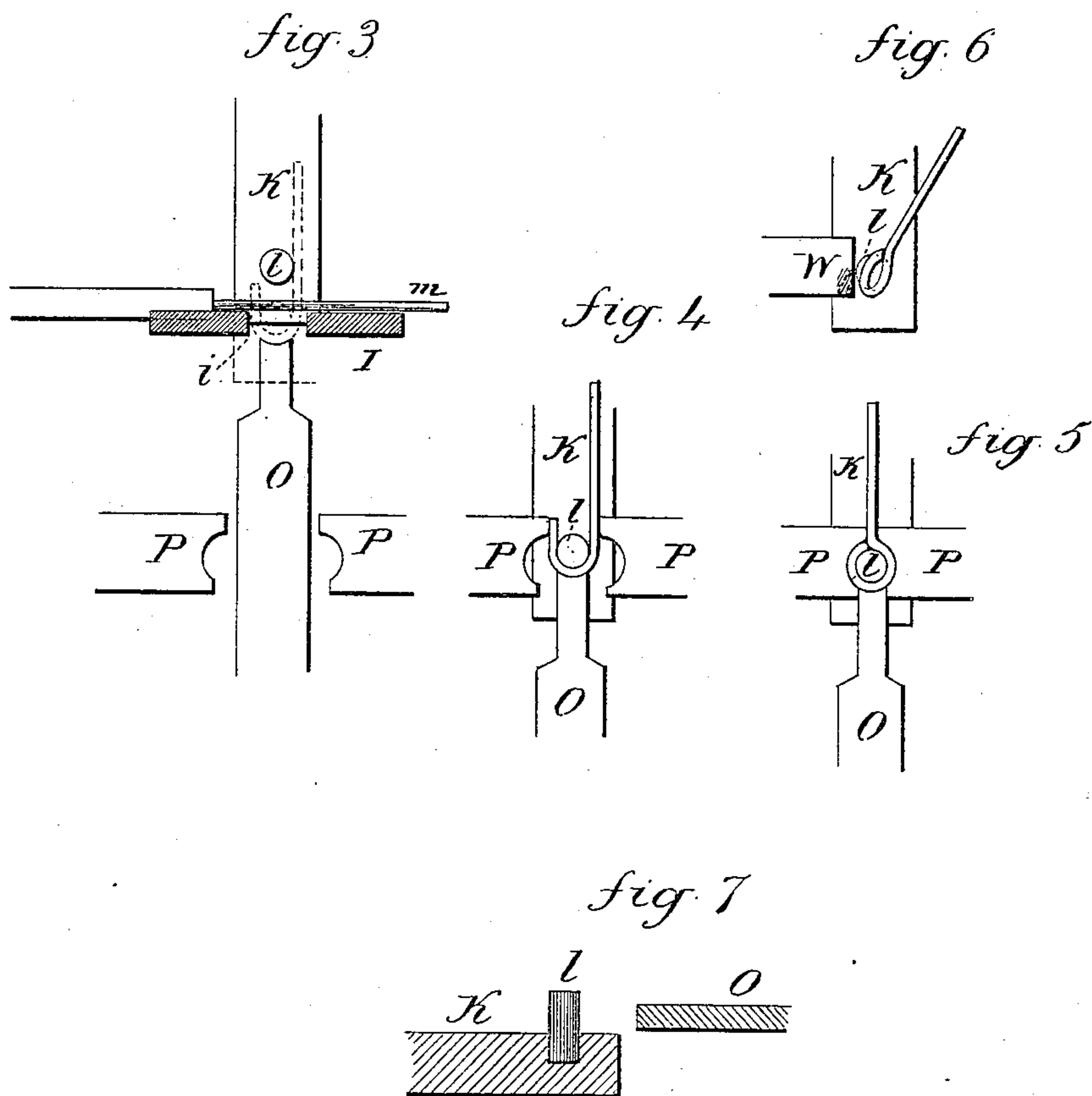
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UNITED STATES PATENT OFFICE.

EDWARD A. ALPRESS, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO
LANDERS, FRARY & CLARK, OF SAME PLACE.

MACHINE FOR BENDING SCREW HOOKS AND EYES.

SPECIFICATION forming part of Letters Patent No. 270,362, dated January 9, 1883.

Application filed August 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, EDWARD A. ALPRESS, of New Britain, in the county of Hartford and State of Connecticut, have invented new Improvements in Machines for Bending Screw Eyes and Hooks; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a top or plan view; Fig. 2, vertical sectional view cutting in front of the plate I and through the hopper; Figs. 3, 4, 5, and 6, detached views, enlarged, to illustrate the operation of the machine; Fig. 7, longitudinal section through the bender and holder.

This invention relates to an improvement in machines for bending screw hooks and eyes, with special reference to the bending of hooks from straight blanks which have been previously threaded; and the invention consists in the combination of devices, as hereinafter specified, whereby a blank is properly presented, bent into the required shape, and then discharged from the machine.

A represents the bed of the machine; B, the driving-shaft, arranged in suitable bearings, C, power being applied to revolve the driving-shaft in the usual manner of applying power to other automatic machines.

D is the hopper arranged to receive the blanks and hold them in a column, one above another, in a horizontal position, as seen in Fig. 2. At the bottom the hopper is open at one side, as at *a*, and at the opposite side, as at *b*, the openings corresponding substantially to the size of the blanks, and so that one blank may be moved forward through the opening *b* from beneath the column of blanks, then, the column falling, the next above will be presented to the opening *b*, to be forced through that opening, as before, and so on each successive blank. The blanks are successively taken from the hopper by means of a follower, *d*, as seen in broken lines, Fig. 1, which is arranged to move in a plane parallel with the blanks, and in line with the lower blank of the column, as seen in Fig. 2. It is attached to a slide, E, arranged for lon-

gitudinal reciprocation on a guide, F, such reciprocation being imparted to it by means of a crank-wheel, G, on a shaft, H, in connection, by bevel-gears, with the driving-shaft B, as seen in Fig. 1. The crank-pin carries an anti-friction roll, *e*, which runs in a vertical slot in the slide E, as seen in Figs. 1 and 2, each revolution of the crank imparting one full reciprocating movement to the follower *d*, so that as it advances it passes through the opening *a*, at one side of the hopper, strikes the lowermost blank and carries it through the opening *b* at the opposite side. The follower returning, the column of blanks falls to present the next successive blank in line with the follower, so that the next revolution of the crank will take the second blank, and so on, each reciprocating movement delivering one blank from the hopper. As the blank leaves the hopper it passes in rear of a plate, I, as seen in broken lines, Fig. 1. This plate has an opening, *i*, through it from the rear to the front at right angles to the blank, and in line with that opening is a bender, K, arranged to reciprocate in a path at right angles to the blank or path of the follower. The bender is arranged upon a slide, L, to which the reciprocating movement is imparted by means of a crank-wheel, M, on the driving-shaft B, as seen in Fig. 1. The bender carries an upwardly-projecting stud, *l*, which, in the reciprocating movement of the bender, passes through the opening *i* in the plate I. The blank stands between the plate I and the stud *l*, as seen in Fig. 3, *m* representing the blank. Then when the bender advances the stud *l* strikes the blank, doubles it, and forces it through the opening *i* in the plate I, as seen in broken lines, Fig. 3. In front of the opening in the plate, and on a slide, N, is a holder, O. The holder is held forward toward the plate by means of a spring, *n*, the holder having a movement in line with the bender to a certain extent independent of the carriage N, as more fully hereinafter described. As the bent blank passes through the opening *i* in the plate I, its bent end strikes the end of the holder O. The bender, still advancing, carries the blank forward, held between the stud *l* and the end of the holder O, the said holder now moving under the forward force of the bender

K and the slide which carries it until the stud *l* arrives at a position between the benders P P. As it approaches this position, connection is made between the slide L and the slide N, here represented as by a shoulder, *r*, on the holder O, coming against a corresponding shoulder, *s*, on the slide, as seen in broken lines, Fig. 1. From that point the slide N, holder, and bender move together. The transverse benders P P are respectively arranged in transverse slides R R, moving between guides T on the slide N, and so as to move with the slide N. At the same time an inward advancing movement is imparted to the slides R R by means of a strut, U, at each side, one end of each strut hung to a stationary part of the frame, as at *t*, the other end hung to the respective slides, as at *x*. In their normal position the struts stand inclined inward. Hence as the slides R are carried outward with the slide N the struts pass to a horizontal position, the points *x* moving inward on the arc of a circle, of which the pivot *t* is the center, causing the slides R to correspondingly move inward. This inward movement carries the benders P P against the respective sides of the blank, as seen in Fig. 4. Continuing, the two sides are turned inward around the stud *l*, as seen in Fig. 5, thus forming an eye corresponding in shape to the shape of the stud *l*.

It will be understood that the position of the blank with relation to the stud *l* and the opening *i* through the plate I is such that the screw or longer end of the blank will project farther to one side than the other end, the other end being so short as just to meet the longer leg when bent around the stud *l*, as seen in Fig. 5. This completes the bending of the blank. The parts then return to their first or normal position, the bent hook still hanging upon the stud until it returns upon the opposite side of the plate I, where it strikes upon a wedge-shaped discharger, W, (see Fig. 6,) which lifts it from the stud and throws it from the machine. Then the next blank is introduced and bent in like manner. In returning to the normal position or position for receiving the blank, the slide N may be moved by springs or by positive connection with the slide L, and which return draws the slides R R, respectively, to the right and left, because of the strut or link-like connections U.

By employing the feed which I have described for individual blanks I am enabled to thread the blanks in an automatic screw-threading machine before they come to the bending-machine, which greatly facilitates the manufacture of screw eyes and hooks, because when bent before they are threaded, which has been hitherto the general method of manufacturing the bent hook or eye end prevents the threading being done upon an automatic feed, each blank being required to be introduced by hand to the threading apparatus.

If, instead of an eye, the article is to be a hook, the benders P P and the stud *l* will be

shaped accordingly; otherwise the machine is the same for screw eyes or hooks. It will be understood by those skilled in the art that the machine may be adjusted for various sizes of hooks or eyes.

I am aware that machines for automatically bending hooks and eyes of various characters have been made, whereby the wire is presented between benders which give the required shape to the hook or eye, and therefore do not claim broadly such mechanism; but

What I do claim is—

1. The combination of the stationary plate I, provided with an opening, *i*, and arranged to receive a blank upon one side, a bender or stud, *l*, arranged for reciprocating movement through the opening in said plate, and so as to double the blank through said opening, and transverse benders P P, between which the said bender presents the doubled or partially-bent blank, the said benders arranged upon slides, to which a transverse movement is imparted by the slide which carries the bender *l*, substantially as described.

2. The combination of the stationary plate I, provided with an opening, *i*, and arranged to receive a blank upon one side, a bender or stud, *l*, arranged for reciprocating movement through the opening in said plate, and so as to double the blank through said opening, a holder, O, to support said blank against said stud after it has passed through the opening in the plate I, the said holder arranged upon a carriage movable in a path in line with the bender, and slides R R, arranged on the carriage which carries the holder in guides transverse to the path of movement of the said holder, the said slides carrying benders P, with struts U, one end pivoted to a stationary part of the frame of the machine, the other pivoted to the said slides R R, and whereby a longitudinal movement of the holder imparts transverse movement to the benders, substantially as described.

3. The combination of the stationary plate I, provided with an opening, *i*, and arranged to receive a blank upon one side, a bender or stud, *l*, arranged for reciprocating movement through the opening in said plate, and so as to double the blank through said opening, and transverse benders P P, between which the said bender presents the doubled or partially-bent blank, the said benders arranged upon slides, to which a transverse movement is imparted by the slide which carries the bender *l*, with a hopper carrying a column of blanks, and a reciprocating follower arranged to work through the bottom of the hopper and deliver the lowest blank to a position in rear of the plate I and forward of the bender, substantially as described.

4. The combination of the stationary plate I, provided with an opening, *i*, and arranged to receive a blank upon one side, a bender or stud, *l*, arranged for reciprocating movement through the opening in said plate, and so as

to double the blank through said opening, a holder, O, to support said blank against said stud after it has passed through the opening in the plate I, the said holder arranged upon
5 a carriage movable in a path in line with the bender, and slides R R, arranged on the carriage which carries the holder in guides transverse to the path of movement of the said holder, the said slides carrying benders P, with struts
10 U, one end pivoted to a stationary part of the frame of the machine, the other pivoted to the said slides R R, and whereby a longitudi-

nal movement of the holder imparts transverse movement to the benders, with a hopper carrying a column of blanks, and a recip- 15 rocating follower arranged to work through the bottom of the hopper and deliver the lowest blank to a position in rear of the plate I and forward of the bender, substantially as described.

EDWARD A. ALPRESS.

Witnesses:

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