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UNITED STATES PATENT OFFICE.

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MACHINE FOR HEADING SCREW-WRENCHES.

Specification of Letters Patent No. 29,360, dated July 31, 1860.

To all whom it may concern:

Be it known that we, LORING COES and AURY G. COES, of Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Machines for Heading and Forming Screw-Wrenches or Screw-Wrench Blanks; and we do hereby declare the following to be a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 represents a perspective view of the machine. Fig. 2, represents a vertical section through a portion of the same. Fig. 3 represents a section through the horizontal dies, and a portion of the bed or base. Fig. 4, represents an elevation of a portion of the tripping apparatus—and Fig. 5, represents a top plan of the horizontal dies, and of the bed or base.

Similar letters of reference where they occur in the separate figures denote like parts of the apparatus in all the figures.

Our invention relates to a machine for forming and heading the blanks of screw wrenches, in which the head is paned down with uniformity of shape, and with great expedition.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction, and mode of operation, in connection with the drawings.

A represents a bed or base upon which are mounted the columns B, for supporting a cap plate C, the whole forming a stout substantial frame for carrying, guiding, and directing, the several operative parts of the machine, as will be hereafter more particularly referred to.

D, E, are two upright shafts which are stepped at *a, a* in the bed plate F, and supported near their tops in the cap plate C, so as to freely and truly turn in their bearings and supports. On the tops of these two shafts D, E, are cogged gears G, G, which mesh with each other, and one of the shafts may have upon it a fly wheel to give the machine uniformity of motion, and a pulley, by which it, as well as its fellow, may be driven from any first moving power. At the lower ends of these shafts—or at a level with the top of the bed plate F—are placed two cams *b, b*, one for each shaft, the objects of which (cams) are, to operate the

side dies *c, c*. The shaft D, has upon it a lifting cam H, which catches against or under a stud *d*, in the hammer, to raise up said hammer, as will be described in the operation of the machine.

I, is the hammer, which is guided in its ascent and descent by the posts B, and by a central rod J, which moves through the cap plate C. The bottom of this hammer is furnished with a die *e* of the form shown in Figs. 2, 4, said die being removable, so as to change the size, or for repair when necessary. The hammer is raised by the cam lifting piece H, taking under the stud *d* in the hammer. There is also upon the hammer a stud or pin *f*, by which it is caught and held up when it is not desirable to have it in operation. The catching and holding device, is also connected with a tripping mechanism, so that the operator can at any time start the hammer. This device, and tripping mechanism, we arrange as follows:

g, is a hook, or keeper, which is pivoted to a sustaining bar *h* attached to the cap piece C; this hook or keeper is ordinarily out of the line of motion of the stud or pin *f* in the hammer; but there is connected to it, a link *i* that is attached to the bell crank *j*, said bell crank by its other arm being connected to a treadle K, by a rod *k*, as distinctly seen in Fig. 1, so that the attendant by placing his foot upon the treadle K, will draw the hook or keeper *g*, within the line of motion of the pin *f*, and as soon as the pin rises to the height of the notch in the keeper, the keeper catches it, and thus holds it, until the attendant desires to let it drop, which he does through the following described mechanism: On the keeper *g* there is a sliding piece *l*, which has upon it a projection *m*, and to this sliding piece is attached by a slot and pin, a pivoted lever L, which is held up (and also holding said sliding piece), by the spring *n*. When the attendant desires to set the hammer in motion, he seizes the handle of the lever L, and by bearing down upon it, he brings the projection *m* down within the path of a tripping arm M, that is placed at the top of the lifting cam H, and this arm M, striking against the projection *m*, throws it and the keeper to one side, releasing the hammer, and allowing it to fall. The hammer under this position of the mechanism will continue to rise and fall, until the operator or attendant presses again upon the treadle K

which again throws in the catching apparatus. It is important that the tripping apparatus should work in connection with the lifting cam (the lifting cam being in constant motion while the other parts are only intermittently so); otherwise the hammer might fall before the cam was out of the way of the descent of the pin *d* and hammer, which would break the pin or cam, or damage the machine—tripping however by the arm *M* which is at the extreme of the throw of the cam—it (the cam) is out of the way entirely when the hammer drops.

On, or in the bed plate *F*, there is a sliding anvil block *O*, which has in it an opening *o*, for receiving the shank of the wrench blank that is to be operated upon. The anvil block is made movable partly for the purpose of drawing it out into convenient position for placing the blank in it (and partly for another purpose that will be hereafter mentioned), and for this purpose it is connected by a link *P*, to a hinged lever *Q*, which the attendant from his position at the machine, can readily grasp and operate. When the shank of the blank is introduced into the opening *o* in the anvil block, it (the anvil block) is run in under the dies until it comes against a gage piece *p*, Figs. 2 and 5, and this gage piece beside defining the proper position of the anvil block under the hammer also forms one of the dies, or walls of the chamber in which the wrench head is formed, and it is moreover adjustable, and removable so as to adapt the machine to the making of different sized wrenches or wrench blanks. A second and very important element in connection with this sliding anvil block is as follows: After the head of the wrench blank has been nearly or quite formed by the dies *c*, *c*, and *e*, and the gage piece *p*, the attendant then draws forward the anvil block a specified distance, which is defined by a gage hook *R* pivoted to the lever *Q*, and which when elevated at its outer end, will, as the lever *Q* is drawn forward, catch upon a stop *q* which is so placed as to bring the wrench blank and anvil block to the exact position where another operation is effected, viz: the "paning" of the wrench jaw, which is done by the bevel on the hammer die (*e*), the effect of this die being to work off all the excess of

metal at the small end of the wrench head. In Fig. 2, the blank is represented in blue lines in its first position, and the positions of the several parts to bring it into its second position are shown by red lines. After the "paning" is done the blank is run back again into such a position as will bring the front of the hole in the anvil, directly under the angle *e* of the hammer where it receives a few blows of the hammer (two or three) to smooth down any inequalities it may receive in the "paning" process.

The dies *c c* are protected in casings *r, r*, and ways *s, s*, and are made in two pieces so that by slipping in or taking out thin plates at *t* they may be changed to work upon smaller or larger wrench heads. The springs *u, u* in the dies are for keeping said dies in contact with their respective cams.

We have described the anvil block alone as being made movable. It is obvious that, instead of moving the blank and anvil block out and in under the hammer, the hammer itself may be made movable and accomplish the same end.

Having thus fully described our invention what we claim therein as new, and desire to secure by Letters Patent is—

1. The combination of the anvil block *O*, side dies *c, c*, gage *p*, and hammer die *e*, for the purpose of forming and heading the blanks of screw-wrenches, substantially as described.

2. In combination with the hammer die *e*, and the anvil block, a gage for defining the relative positions of these parts with regard to the blank for the purpose of "paning" down the thin part of the jaw of the wrench blank, substantially as described.

3. In combination with a hinged catch *g*, the foot lever or treadle *K*, for catching and holding up the hammer, substantially as described.

4. In combination with the catch and its sliding piece *l*, a tripping arm on the cam, so that the hammer when tripped will not fall upon the cam, substantially as herein described.

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Witnesses:

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