

2 Sheets—Sheet 1.

DIE FOR CUTTING OFF AND POINTING PIECES OF WIRE.

Patented Dec. 1, 1891.

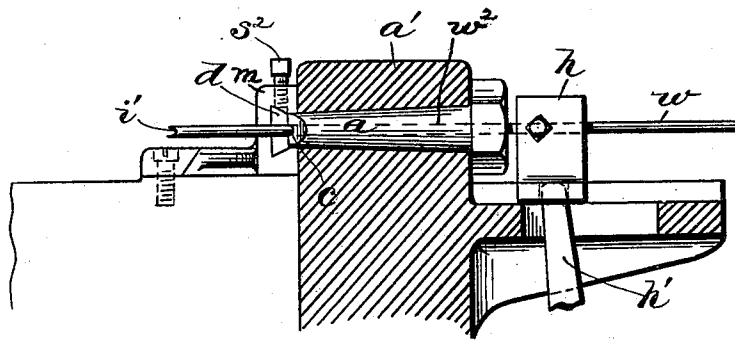
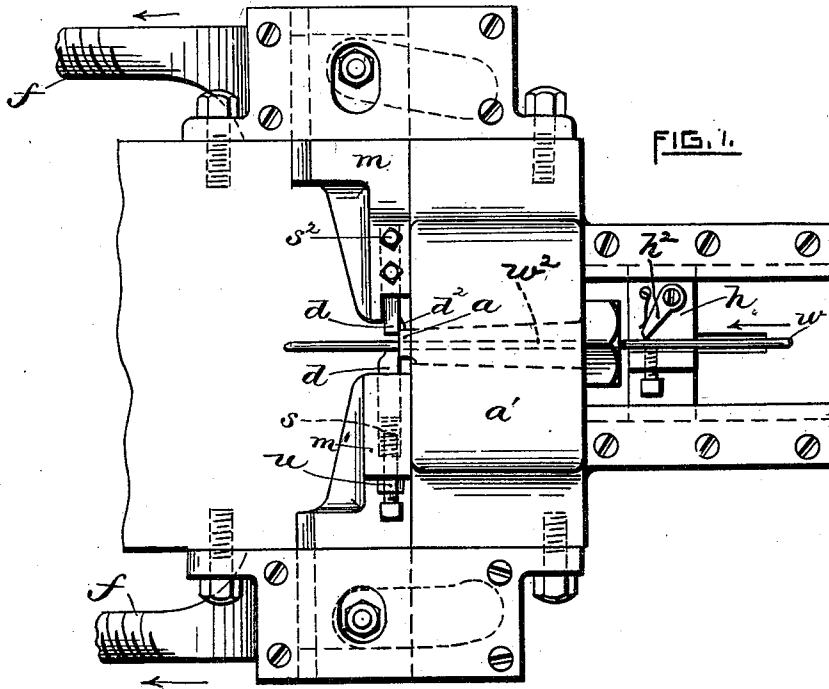


FIG. 2.

WITNESSES.

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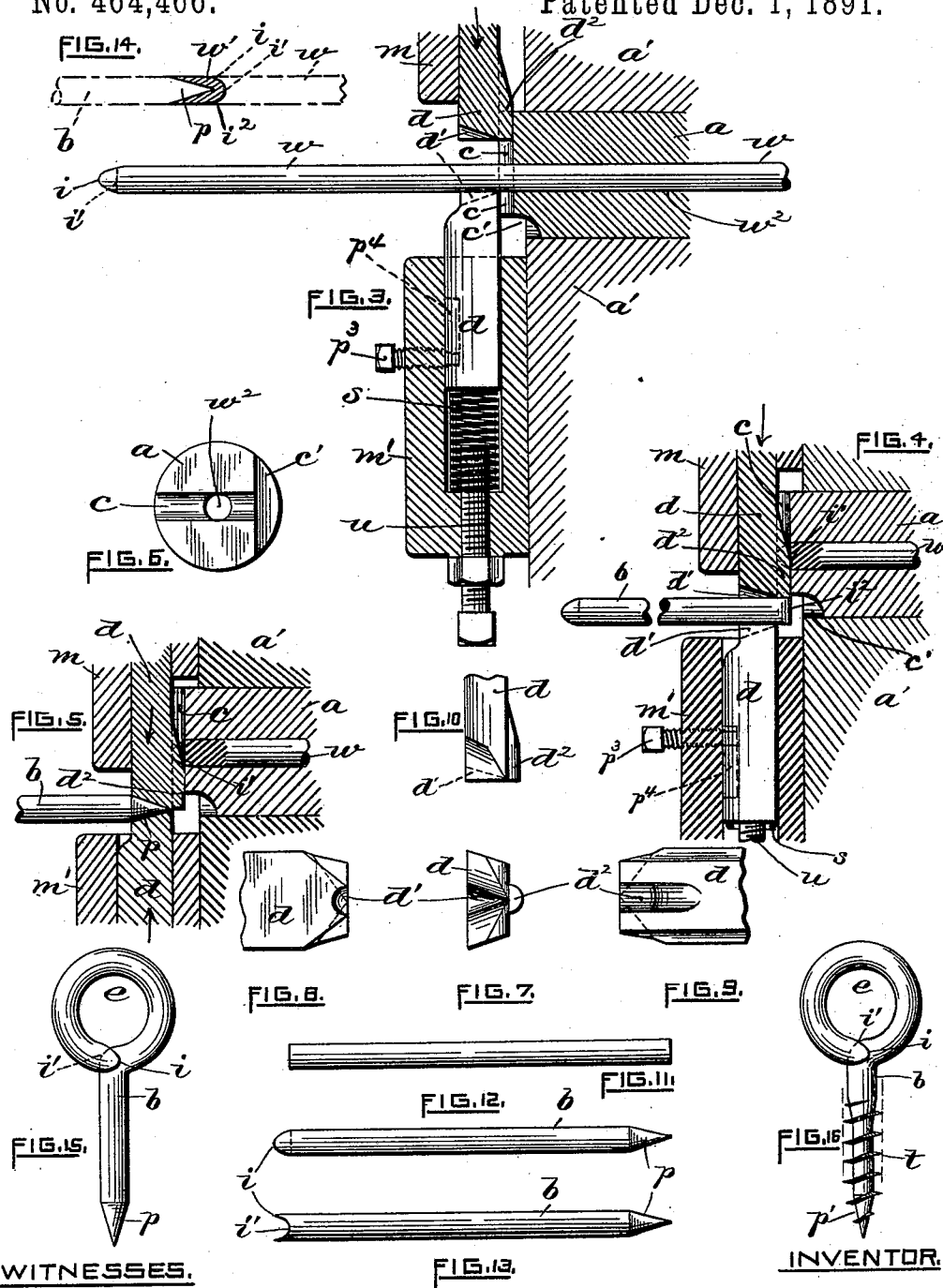
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DIE FOR CUTTING OFF AND POINTING PIECES OF WIRE.

No. 464,466.

Patented Dec. 1, 1891.



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# UNITED STATES PATENT OFFICE.

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## DIE FOR CUTTING OFF AND POINTING PIECES OF WIRE.

SPECIFICATION forming part of Letters Patent No. 464,466, dated December 1, 1891.

Application filed August 12, 1891. Serial No. 402,437. (No model.)

### *To all whom it may concern:*

Be it known that I, CHARLES D. ROGERS, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Dies for Cutting Off and Pointing Pieces of Wire; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

In a companion application for United States Letters Patent, Serial No. 402,436, I have described and claimed a screw-eye possessing novel features.

My present application for patent is for a peculiar die for cutting off and pointing the wire preparatory to converting it into a screw-eye.

In United States Patent No. 393,519, granted to me November 27, 1888, I have described a die adapted more especially for cutting off and pointing wood-screw blanks and nails. In that die, however, the construction is such as to form a convex end on the standing portion of the wire.

Heretofore in the production of "wire screw-eyes," so called, it has been usual to cut off the wire blank substantially square at both ends, one end being subsequently turned off or shaved to a cone-shaped form, after which a screw-thread is cut thereon and along the adjacent portion of the shank. Such cutting away of the metal to form the threads greatly reduces the strength or holding power of the screw-eye. The other portion of the blank is bent to form an eye, the corresponding end of the wire being compressed and upset against the shank or stem, thereby producing a burr or fin on each side, the joint thus made being rough and undesirable.

The object of my present invention is to provide a machine with dies adapted in use to sever the wire, so as to form a substantially half-round groove across its end, which when properly bent, as in forming the head or eye,

fits snugly around a portion of the shank of the screw-eye blank and produces a smooth joint. The dies are further arranged to point the piece of wire thus severed. During the last-named operation a small portion of the metal is removed from the blank and goes to waste. The piece of wire is now ready to be converted into a screw-eye by first bending one portion of it into an eye form, the other or shank and point portion being subsequently acted upon by dies, which roll or swage the metal laterally to produce screw-threads having a diameter exceeding that of the wire itself.

In order to produce the screw-eyes just referred to, it is necessary to first sever the wire in a peculiar manner. This is accomplished by the dies forming the subject of my present invention, the same consisting, essentially, of a cutting-off die having its working face or end provided with a tapering point-forming recess having sharpened edges and a projecting lip or tongue, the form of the latter transversely being the counterpart of the groove to be formed in the end of the wire. It further consists in mounting one of the cutting-off dies in a holder provided with an adjusting screw and spring, all as will be hereinafter set forth and claimed.

In the appended two sheets of drawings, Figure 1, Sheet 1, is a partial plan view of a machine employing my improved dies, adapted to cut off wire preparatory to being bent and converted into screw-eyes. Fig. 2 is a side sectional elevation of the same. Fig. 3, Sheet 2, is a horizontal sectional view, enlarged, showing the wire standing in the guide-tube before being severed by the dies. Fig. 4 is a similar view of the parts after the piece of wire has been severed and carried laterally, at the same time forcing the yielding die against the stop. Fig. 5 represents the same at the instant the two dies have completed the pointing operation, the piece of wire still being held between them. Fig. 6 is an end view of the guide-tube. Figs. 7, 8, 9, and 10 are views of the die, said figures representing the end, left, right, and top sides, respectively. Fig. 11 represents a piece of wire as usually cut before being bent to

an eye-form. Figs. 12 and 13 are views of the piece of wire as cut by my improved dies. Fig. 14 shows the waste stock produced in severing and pointing the piece of wire. Fig. 15 is a side elevation of the piece of wire represented in Figs. 12 and 13 after being bent to form the screw-eye blank, and Fig. 16 is a similar view of the finished screw-eye.

In Sheet 1 of the drawings I have represented a portion of a machine provided with my improved dies adapted in operation to intermittently cut off lengths of wire from a continuous length or coil. I make no claim herewith to this or any other specific form of mechanism, as the invention resides mainly in the novel form of the dies and in the manner of mounting them.

Referring again to the drawings,  $a'$ , Figs. 1 and 2, indicates the head portion of a machine provided with a removable guide-tube  $a$ , having a central longitudinal hole  $w^2$  therein, corresponding with the diameter of the stock-wire  $w$ . The wire may be fed along through said tube  $a$  by means of an intermittently-vibrating lever  $h'$ , jointed to a movable feed-block  $h$ , carrying a dog  $h^2$ , arranged to engage the wire. The front end of the guide-tube is provided with a groove  $c$ , cut transversely across its face, (see Figs. 3, 6, &c.) the form and size of the groove being substantially equal to one-half of the wire cross-sectionally. The machine is further provided with horizontally-mounted die-holders  $m$   $m'$ , arranged to be reciprocated back and forth a short distance by means of suitably-operating links or connections  $f$ .

My improved die  $d$  is clearly represented in detail in Figs. 7 to 10, &c. The inner face or end of the die is provided with a tapering cavity or recess  $d'$ , terminating in sharpened edges, the construction being such that when combined with a duplicate die, as in use, the complete cavity forms the counterpart of the point  $p$  of the screw-eye blank. One of the dies—say the one secured in the die-holder  $m$  by means of screws  $s^2$ —is further provided with a central tongue  $d^2$ , extending from the side contiguous to the face of the guide-tube  $a$ , the said tongue being substantially half-round cross-sectionally and fitted to slide along the groove  $c$ , before described. The other or opposite die is mounted to slide endwise in the holder  $m'$ , its rear end communicating with a space containing a spiral spring  $s$ , the latter serving to automatically maintain the die in yielding contact with the wire. A stop  $p^3$ , Fig. 3, having its end fitted to a groove  $p^1$  formed in the die, may be employed to limit the latter's forward movement—that is, the movement due solely to the spring's action. This die is further arranged to engage an adjustable stop  $u$ , thereby limiting its rearward motion, as clearly represented. It will be seen that such movement of the die is independent of that imparted to the holder itself by the connection  $f$ .

In the process of cutting off the pieces of wire  $b$ , from which the screw-blanks are to be formed, the two dies are so set or adjusted with relation to each other that the principal or cutting-off die mounted in the holder  $m$  stands in its rearward position, while the main wire  $w$  is being fed ahead the desired distance, the spring  $s$  at the same time keeping the other die in contact with the wire, as shown in Figs. 2 and 3. Now in forcing the holder  $m$  ahead or toward the center the tongue  $d^2$  of the die slides along the groove  $c$  of the guide-tube and, engaging the wire, shears it off, the two dies then holding the piece centrally between them. By and during such forward movement of the holder the other die is forced rearwardly until arrested by the stop  $u$ , the piece of wire having thereby been carried laterally beyond the groove  $c$ , the several parts then appearing as represented in Fig. 4. Thus far it will be seen that the actual pointing of the piece of wire has not been effected, the end  $w^2$  being substantially semicircular in form, corresponding with the shape of the tongue  $d^2$ . (See Figs. 4 and 14.) When in this position the relation of the mechanism for operating the two die-holders is such that they are gradually and simultaneously forced together or toward each other, thereby at the same time causing the two dies to cut away the stock and form the point  $p$  upon the piece of wire, the shape of the point being the counterpart of the die-cavity  $d'$ . Fig. 5 shows the position of the dies, &c., at the instant of completing the point. The holders are next moved in the opposite direction, thereby dropping the piece of wire  $b$  from the dies, such movement continuing until they again assume the position shown in Fig. 3 preparatory to repeating the cutting-off operation. During this movement the wire  $w$  is fed ahead, the spring  $s$  causing the corresponding die to bear against the wire, as before described.

It will be seen that a concave groove or recess  $v'$  is formed across the end of the standing wire by the action of the cutting-off die, the adjacent end of the severed piece having a counterpart form. This latter, together with the surplus metal removed by the action of both dies in producing the point  $p$ , is clearly shown by the sectional lines at  $w'$ , Fig. 14, while Figs. 12 and 13 represent the thus-pointed piece of wire before it is bent to form the screw-eye blank shown in Fig. 15. The latter, as drawn, is provided with a head or eye  $e$ , the grooved end  $v'$  of the wire then fitting and overlapping a portion of the shank. Fig. 16 represents the finished screw-eye, the shank having a screw-thread  $t$ , whose diameter exceeds that of the wire. (See dotted lines.) Screw-threads of this type may be produced by the cold-rolling process by means of suitably-constructed reciprocating dies.

I claim as my invention—

1. A cutting-off die having its working face

or end provided with a point-forming recess, and further having a projecting tongue, as  $d^2$ , substantially as described, and for the purpose set forth.

5 2. In a machine for cutting continuous wire into short lengths, the combination, with a guide-tube arranged to receive the wire, having a groove or recess, as  $c$ , formed in its face, of a pair of suitably-mounted cutting-off dies  
10 provided with a point-forming recess and a projecting tongue, constructed, arranged, and operating substantially as hereinbefore described, and for the purpose set forth.

15 3. In a machine for cutting wire into lengths, the combination, with a guide-tube having a groove  $c$  formed in its face, of a mounted die provided with a point-forming recess and a tongue adapted to work in said groove, a reversely-arranged die provided with a similar  
20 point-forming recess in yielding contact with the wire, and a stop for limiting the die's movement, substantially as hereinbefore described.

25 4. The improvement, substantially as hereinbefore described, in cutting off pieces of wire, the same consisting, first, in feeding the wire ahead the desired distance, next severing or shearing the piece and moving it laterally, thereby producing a groove across the  
30 adjacent end of the standing wire, and then shearing and compressing the corresponding

end of the piece of severed wire to form a point.

5. The improvement, substantially as hereinbefore described, in producing screw-eyes 35 from a continuous piece of wire, consisting, first, in feeding the wire ahead the desired distance; second, shearing a piece therefrom and moving it laterally, thus forming a concave groove across the end of the standing 40 wire; third, shearing or pinching of the surplus metal from the corresponding end of the piece of wire to form a point; fourth, forming the screw-eye blank by bending a portion of the wire to form an eye  $e$ , the grooved end fitting and overlapping the shank, and, finally, 45 rolling an enlarged screw-thread upon the shank.

6. The cutting-off die hereinbefore described, having its working face or end provided with a tapering point-forming recess 50 having sharpened edges and a projecting tongue arranged substantially in line with the axis of said recess, for the purpose set forth.

In testimony whereof I have affixed my signature in presence of two witnesses. 55

CHARLES D. ROGERS.

Witnesses:

CHARLES HANNIGAN,  
GEO. H. REMINGTON.