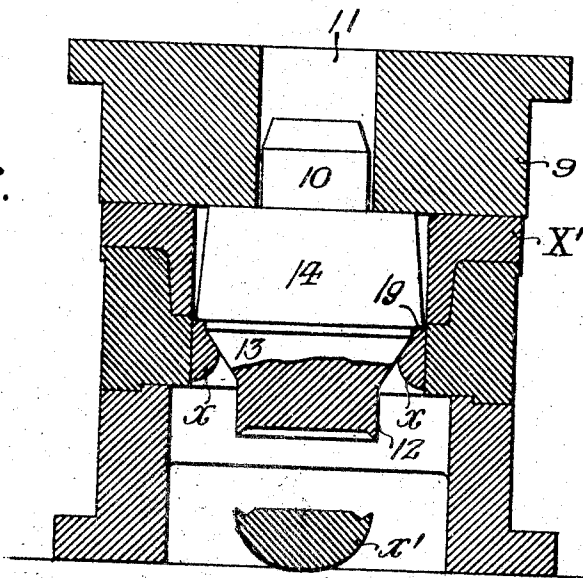
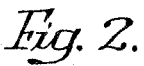


1,040,160.

Fig. 1.



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UNITED STATES PATENT OFFICE.

CHARLES C. DAVIS, OF PHILADELPHIA, PENNSYLVANIA.

FLANGING-MACHINE.

1,040,160.

Specification of Letters Patent.

Patented Oct. 1, 1912.

Application filed October 14, 1911. Serial No. 654,684.

To all whom it may concern:

Be it known that I, CHARLES C. DAVIS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Flanging-Machines, of which the following is a specification.

One object of my invention is to provide a simple, substantial and rapidly operable machine for forming hubs, bosses, flanges, or other annular structures; it being especially desired to provide means for manufacturing articles of the above noted class more rapidly and at a less expense than is now possible. These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which:—

Figure 1 is a vertical section of the die and punch of a machine constructed according to my invention, showing a plate in position ready for flanging, and Fig. 2 is a vertical section similar to Fig. 1, showing the various parts in the positions occupied after the flanging operation has been performed.

In the above drawings, 1 represents a die-supporting base, preferably in the form of an annular structure, flanged at its lower edge as indicated at 2 so as to provide a substantial support and having an opening 3 on one side for the removal of the punchings. Its upper edge is provided with an annular or other projection 4 designed to engage a correspondingly formed recess in the under face of a die 5. This latter is likewise of an annular form; having—in this instance—a central opening 6 and an annular recess 7 concentric therewith. The punching tool 8 is mounted in a head 9 which is provided with a central recess for the reception of a centrally placed projection 10 on said punching tool; it being noted that the upper end of said projection is preferably beveled or tapered, as shown, to facilitate the entry of the projection into the recess 11 of the punch head and the consequent centering of the punching tool. This latter, on its lower end, is provided with a punch 12, above which is a conical section 13 forming an extension or continuation of said punch. The main part or body 14 of the punching tool is upwardly tapered and the upper portion of the conical section 13 is cut away adjacent said body so that the lower edge of

the latter provides a shearing edge immediately above said part 13.

It is to be understood that the punch head 9 is mounted in any suitable manner in a hydraulic or other power press, and under operating conditions a plate X, from which an annular structure is to be made, is placed on the top of the die 5. The punching tool 8 is then placed at approximately the central part of this plate and the press is put in operation so that the head 9 is lowered on to said tool. The tapered upper end of the projection 10 first enters the opening 11 of this head and thereafter the lower face of the latter engages the upper surface of the tool body 14; causing the punch 12 to cut, first a disk-like button α' out of the center of the plate, and then to pass through the latter. The conical part 13 of the tool then bends down the inner edges of the annular structure previously formed so that these are shaped into a flange, boss or hub extending in lines at or about a right angle to the general plane of the structure, being pressed into and given a predetermined shape by the annular recess 7 of the die 5. The continued downward movement of the punch head 9 then forces the body 14, of the punching tool, through the flanged opening of the annular structure which now assumes the form indicated at X' and the shearing edge 19 of said body makes a clean cut through said structure, removing therefrom a ring-shaped piece α which, with the disk or button α' , may be removed through the opening 3. The head 9 is now raised and the finished structure X' may be removed from the die, after which the punching tool 8 may, likewise, be taken out.

It is, of course, understood that while this machine is preferably used for operating on heated material, it may—in some instances, be used on cold metal, etc. It will further be noted that the openings or recesses of the die and the horizontal sections of the punching tool are not necessarily circular, since, without departing from my invention, they may be given other forms, if it be desired to make hubs or flanges having other sections.

I claim:

1. The combination in a flanging machine, of a die having an opening and an annular recess adjacent the opening; with a punching tool having a cutting part placed to cut first an opening in a piece of material, and pro-

vided with a conical part adjacent said cutting part for bending the material of the piece in the form of a flange into the recess of the die.

- 5 2. The combination in a flanging machine, of a die having an opening and an annular recess adjacent the opening; with a punching tool having a part formed to cut first an opening in the piece of material and provided with a conical part adjacent the cutting
10 part for bending said material of the piece in the form of a flange into the recess of the die; said punch also having a second cutting portion for forming a clean opening through
15 the flanged part of the piece of material.
3. The combination in a flanging machine,

of a die and a punching tool; the latter consisting of a body portion having a cutting portion provided with a cutting edge and tapered upwardly therefrom; a conical
20 flanging portion tapering downwardly from said cutting edge; and a second cutting portion of smaller diameter than the first cutting portion, forming a substantial continuation of the flanging portion.

25 In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES C. DAVIS.

Witnesses:

AUGUSTUS B. COPPES,
JOS. H. KLEIN.