

(No Model.)

S. E. NORTON.

METHOD OF AND DIE FOR CUTTING OUT SHEET METAL BLANKS.

No. 304,352.

Patented Sept. 2, 1884.

Fig 1

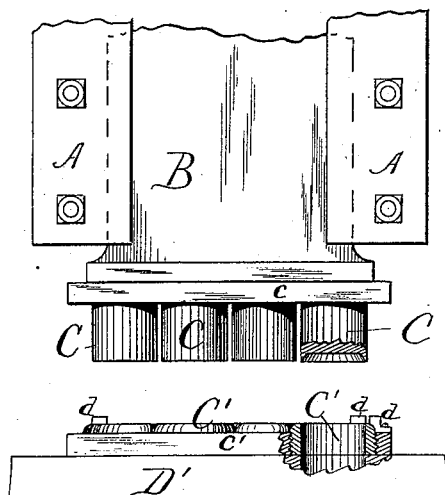


Fig 2.

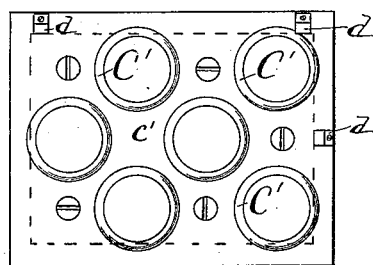


Fig 3.

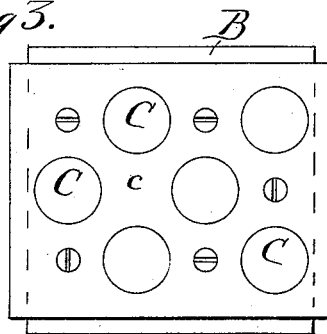


Fig 4.

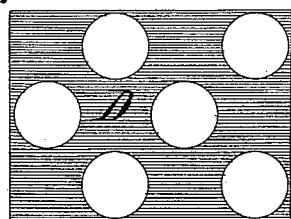
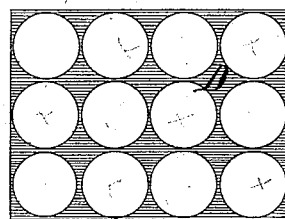


Fig 5.



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UNITED STATES PATENT OFFICE.

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METHOD OF AND DIE FOR CUTTING OUT SHEET-METAL BLANKS.

SPECIFICATION forming part of Letters Patent No. 304,352, dated September 2, 1884.

Application filed November 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, SERENO E. NORTON, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in the Method of and Dies for Cutting out Sheet-Metal Blanks, of which the following is a specification.

This invention relates to improvements in the method or process of cutting out the can heads or ends from a sheet of metal, and in the dies employed for this purpose.

Heretofore in the manufacture of sheet-metal cans circular heads or ends have been cut out one by one from the sheet of metal by means of a single die, the operator having to move the sheet into a different position for every head cut. Considerable skill is also required on the part of the operator to adjust the sheet into proper position at each stroke of the die, so as not to waste the stock or form imperfect heads, because if the sheet, for example, is just large enough, say, to make ten heads, if the operator at any one stroke of the die gets the sheet a little out of its proper position, the remaining stock will not be large enough to make perfect heads.

The object of the present invention is to provide a cheaper, better, and more expeditious means of cutting out these heads; and to this end my invention consists in cutting out each alternate head or blank from the sheet at one operation by means of a set of alternately-arranged gang-dies, and then reversing the sheet and cutting out the remaining half of the heads or blanks at a second stroke of the alternately-grouped dies. Stops or guides are provided on the bed-plate, so that the sheet may be accurately adjusted to its position at both strokes of the dies. Instead of turning the sheet end for end and inserting it under the same dies to cut out the second alternate series of heads, the sheet may of course be inserted under a second set of alternately-grouped gang-dies oppositely arranged. Each separate male die of the group is independently secured in the head-plate by means of screw-threads or otherwise, and the corresponding female dies are also independently secured in the bed-plate by similar means, so

that each die may be separately removed for repairs, or replaced by a new one in case it should be broken. As the dies are arranged alternately with vacant intervening spaces, the sheet may be cut without waste, the same as if each head were cut out separately from the sheet.

Heretofore attempts have been made to use gang-dies, but they have been arranged solidly instead of alternately; but their use has been found impracticable, because of the unavoidable waste in the stock, if removable dies were employed, owing to the fact that the female dies, if removably secured in the bed-plate, cannot be set with their cutting-edges close enough together to avoid great waste, owing to the thickness of the female die, and because if such dies are rigid and cut out of the plate itself, the expense attending their use from unavoidable breakage and injury is too great, as if one of such a group of dies becomes injured or broken it cannot be repaired, and the whole plate must be thrown away.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, I have shown as illustrative of my invention in Figure 1 a side elevation of a set of gang-dies; in Fig. 2, a plan view of the female dies; Fig. 3, a bottom view of the male dies; Fig. 4, a plan view of the sheet after each alternate head has been cut out of it by the first stroke of the gang-dies, and in Fig. 5 a similar view of the sheet after the remaining half of the heads has been cut out by the second stroke of the dies.

In said drawings, A represents the guides of the press, in which the movable head B reciprocates. The male dies C are removably secured to a head-plate, c, by means of screw-threads or other suitable means, and are arranged alternately on said head-plate, so as to cut out only each alternate head from the sheet D.

C' are the corresponding female dies, also removably secured to a bed-plate, c', by means of screw-threads, so that they may be readily taken out for repairs and replaced by new ones if broken. The female dies C' are, of course, also arranged alternately the same

as the male dies C. The bed-plate *c'* is provided on one side and end with projections or guides *d*, for the sheet to abut against, so that the operator may readily and quickly place the sheet accurately in position under the dies.

In operation the sheet is placed under the dies with its edges against the stops or guides *d*, and by one stroke of the dies each alternate head is cut out. Then the sheet is reversed or turned end for end and a second time inserted under the dies, the guides *d* again serving to adjust it in position, and by a second stroke the remaining heads are severed from the sheet. Instead of reversing the sheet and inserting it a second time under the same dies, the remaining heads may, of course, be cut out by placing it under another set of gang-dies oppositely arranged. The head-plate *c* and the bed-plate *c'* are secured to the head B and bed D', respectively, by means of screws or bolts. Any number of dies desired may be arranged thus alternately in a group or gang; but I deem it preferable to employ just enough dies in a group to sever at one blow one-half the heads in the sheet of the size used, so that the number of dies which it is desirable to employ in one group will ordinarily in practice somewhat depend upon the size of the heads to be cut from the sheet. In this way all the heads will be cut from the sheet at just two strokes or operations of the press. If desired, however, a less number of dies than necessary to cut out one-half the heads from the sheet may, of course, be employed in the gang or group.

By means of my invention one operator, as will be readily understood, can do as much work as six or eight men can do with the ordinary single dies heretofore in use—that is to say, if six or eight dies are arranged in the group, and proportionately, also, with a greater or less number; and in addition to this advantage better work can be done, as the sheet comes in the same position under the dies at each stroke, and can, therefore, always be governed by the edges of the sheet abutting against the fixed stops, which is not the case when the heads are cut out one by one, and the sheet has to be moved into different positions for each successive stroke. For this reason there is much less danger of wasting the stock by cutting out a head in the wrong place, and the heads can also be cut with even less margin of waste between the contiguous heads. Another great saving by use of my invention is in the greatly-diminished number

of presses required, though of course a somewhat larger and stronger press will be required to operate my set of gang-dies than is necessary to operate the ordinary single die.

It will of course be understood that my invention is also adapted for other analogous uses than cutting out round or other shaped can-heads, and that it is equally well adapted for cutting any other kind of blanks from a sheet.

It is an essential feature of my invention that the dies be arranged so that the intermediate vacant spaces between each two contiguous dies be just large enough for a blank, so that the alternate blanks being cut out at each stroke of the press, the whole sheet, or the whole of that portion of it covered by the group of dies, will be used up or cut into blanks by two strokes of the press. By this alternate arrangement of the dies with intermediate spaces for the blanks between them, I obtain room to attach the dies to the bed-plate, so that they may be independently removed, and still the thickness of the female dies in no way interferes with cutting the sheet up without waste, the same as if the blanks were cut out one at a time by a press with a single pair of dies.

What I claim is—

1. The method of cutting out blanks from a sheet of metal with dies, consisting, first, in simultaneously cutting two or more rows of blanks in such manner that uncut portions equal to the width of one blank shall remain between the spaces left by the cut-out blanks, and that in adjacent rows the cut-out parts shall alternate with those not cut out, and in then readjusting the sheet and cutting out at a second operation the blanks left in such uncut portions, substantially as specified.

2. In a press, the combination, with the bed-plate and the head-plate or plunger, of a series of female dies secured to one of said plates, and a series of corresponding male dies secured to the other and fitting within said female dies, said dies on each plate being arranged in two or more rows with spaces equal to the width of one blank between the separate dies in each row, and the dies in the one row alternating with those in the adjacent row, substantially as specified.

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