UNITED STATES PATENT OFFICE.

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DIE FOR PRESSING SHEET METAL.


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To all whom it may concern:

Be it known that I, CHARLES FRIEDRICH STEIBER, a citizen of the United States, and a resident of the city of New York, borough of the Bronx, in the county and State of New York, have invented a new and Improved Die for Pressing Sheet Metal, of which the following is a full, clear, and exact description.

This invention relates to dies such as are used for pressing sheet metal to produce certain ornamental designs or patterns. The die is intended especially to be used for forming the risers of metal staircases.

The object of the invention is to produce a die of simple construction which can be used so as to form a number of different patterns, differing materially in their general form or artistic effect.

The invention consists in the construction and combination of parts to be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the lower die, partly broken away; Fig. 1® is a fragmentary view illustrating a slight change which can be made in the face of this die; Fig. 2 is a cross section through this die taken on the line 2—2 of Fig. 1, which is near the middle of the die; Fig. 3 is a longitudinal section through the die taken on the line 3—3 of Fig. 1; Fig. 4 is a cross section through a part of the body of the die on the line 4—4 of Fig. 1; Fig. 5 is a bottom plan or face view of the upper die, certain parts being broken away and shown in cross section; Fig. 5® is a detail view showing a portion of the face of the die shown in Fig. 5, and showing a slight change in the face thereof for producing a pattern of a different kind; Fig. 6 is a vertical section taken on the line 6—6 of Fig. 5; Fig. 7 is a longitudinal section through the die block shown in Fig. 5, on the line 7—7 of Fig. 5; Fig. 8 is a vertical section taken on the line 8—8 of Fig. 5; Fig. 9 is a face view of a center die plate which is used to form one of the patterns; Fig. 10 is a view similar to Fig. 9, but showing another form of die plate; and Figs. 11 to 15 are views which show front elevations of stair risers having different patterns which may be made by a die constructed according to my invention.

Referring more particularly to the parts, and especially to Figs. 1 to 4 inclusive, 1 represents the lower die block which consists of a heavy plate or block having an elevated seat face 2 and a depressed face 3. Beyond the seat face or seat 2, there is provided an upward projection or nose 4 which presents a shoulder 5. Throughout the length of the die transverse guides 6 are provided, and on these guides a movable clamp 7 is adapted to be adjusted transversely by means of adjusting screws 8. These screws are mounted in the side of the die block which is opposite to the nose 4, and a projection or abutment 9 is formed on this side for this purpose. At the lower edge of the seat face 2, as indicated in Fig. 2, a jog or shoulder 10 is formed, toward which the clamp 7 moves when adjusted by means of the screws 8. On the upper part of the seat 2, as also indicated in Fig. 2, there is provided a nose die 11, which is in the form of a bar which extends longitudinally of the die block, as shown. This nose die is held in position by a tongue 12 which is received in matching grooves 13 formed in the adjacent faces of the nose die and the seat. The upper edge of this nose die seats against a rail 14 which in turn seats against the shoulder 5, as indicated. Between the nose die 11 and the clamp, there is provided a die bar or shield die 15. This shield die consists of a flat bar which extends longitudinally throughout the entire length of the block. At the middle of the die block, a rectangular main socket 16 is formed in this die bar, and in this socket a center plate 17 is normally held by screws 18, as shown in Fig. 1. At intermediate points toward the ends of the die bar, side sockets 19 are formed, which are also rectangular. The main socket 16 extends completely across the die bar 15, whereas the side sockets 19 extend only partially across, being however, located centrally with respect to the longitudinal axis.

In the side sockets 19, common dies 20 are provided, which simply consist of rectangular plates having longitudinal rabbot grooves 21 in the side edges thereof. These dies 17 and 20 have their outer faces flush with the face of the die bar 15, as will be readily understood. The face of the die bar 15 is provided with longitudinal grooves 22. These grooves 22 register with the grooves 21 so as to enable ribs 23 to be laid longitudinally of the die in the grooves, as indicated in Fig. 4. These ribs 23 are not made in one piece but have short end sections 24 which abut against the
main sections on meeting faces 25, the abutting faces being inclined as indicated in Fig. 1. At the points where the end sections 24 and the main sections of the ribs, transverse grooves 26 are provided respectively, the purpose of which will appear more clearly hereinafter.

The die 17 is provided on its outer face with ribs 27 which extend longitudinally thereof, and which register with the inner ends of the ribs 23 so as to bridge the space between them and to form as it were, continuous ribs extending longitudinally from end to end of the die. The die when arranged in this manner produces what I call a fundamental pattern, and when a riser is impressed by this die it produces the pattern shown in Fig. 15, that is, the ribs 23 and the sections alining therewith produce longitudinal beads 28 which extend from end to end of the riser.

In addition to the die 17, I provide a special die 29, the form of which is shown in Fig. 9, and I also provide a special die 30 having the form shown in Fig. 10. These dies 29 and 30 are adapted to be received in the main socket 16, like the die 17. The die 29 is provided with radial ribs 31 which extend to its end edges, and these ribs are adapted to register with the ribs 23, as will be readily understood. The central portion of the die 29 has a special die pattern such as that shown. The die 30 is provided with longitudinal ribs 32 which extend inwardly from the edges thereof, and these ribs are connected by a cross rib 33, as shown. The ribs 32 are adapted to register with the ribs 23.

Referring now to Fig. 14, I provide a removable cross rib 34 which is cut with inclined ends. When this cross rib is to be used, the short extensions 24 are removed from the grooves and the cross rib is set in position, as indicated in this figure, lying in the grooves 26. When arranged in this way, the ends of the cross rib abut against the inclined ends of the main sections of the ribs 23. When these cross ribs are employed, the die will produce a pattern such as that shown on the riser 35, as indicated in Fig. 14.

With the cross rib 34 in position, the center plate 17 may be removed and the die 29 substituted. This will produce a pattern such as that shown on the riser 35, indicated in Fig. 11. In order to produce a riser having a pattern such as that shown in Fig. 12, the die plate 30 will be placed in the main socket 16. In order to produce a riser such as that shown in Fig. 13, the die plates 20 will be removed from the sockets 19, and special die plates will be placed in position having a form adapted to give an ornamental boss 37. The resulting pattern is indicated by the full lines in Fig. 13. If it is desired to change this double form to a triple, the center plate 17 may be removed and a special die substituted. The die bar 15 is held on the seat 2 by means of screws 15 which is mounted near the ends thereof, as shown in Figs. 1 and 3.

Proceeding to a description of the upper die, and referring especially Figs. 5 to 8, this die comprises a die block 38 which has an elevated seat face 39 upon which a nose die 40 is mounted, as shown. This nose die 40 cooperates with the nose die 11 so as to produce a nose on the upper edge of the riser. Adjacent to the nose die 40, there is provided a die bar 41, similar to the die bar of the other die, except that instead of having ribs extending longitudinally therewith it is formed with longitudinally extending grooves 42. It is likewise provided with a central socket or main socket 43 in which a removable center die 44 is provided, the same having grooves 45 which register with the grooves 42 in the bar. At points on the face of this die, opposite to the plate 20 of the lower die, I provide removable common dies 46 which are received in sockets 47, as shown. These dies have grooves 47 and 48 in the edges thereof which register with the grooves 49 and 42. In the fundamental form of the die, continuous grooves are formed in the face thereof, and cooperate with the ribs of the other die to produce the beads 28 of the fundamental pattern shown in Fig. 15.

When special dies are used in the lower die at the center of the die plate corresponding center die plates are employed in the upper die, as will be readily understood.

Near the ends of the die bar 41, pockets 48 are formed of square shape, which extend from the outer edge of one groove to the outer edge of the opposite groove. In these grooves, removable die plates 49 are provided, which have grooves 50 in their edges, which register with the grooves 42 and form continuations thereof. These grooves 49 are held in position by set screws 51 which are inserted into the ends of the bar. When the aforesaid cross ribs 34 are employed in the lower die, these die plates 49 are removed and turned through an angle of 90°, and then replaced so that one of the grooves 50 forms a connection between the grooves 42, as indicated in Fig. 5. This adapts the upper die to cooperate with the lower die to make any of the forms shown in Figs. 11, 12, or 14. If desired, the nose dies may be attached to the die bars by screws, as indicated in Fig. 5 at 52.

The die block is provided with transverse guides 53 on which a clamping bar 54 slides, said clamping bar being provided with adjusting screws 55 having threaded extensions 56 which extend into the die block under the seat 39, as indicated in Figs. 5 and 6. By adjusting these screws 55, the clamping bar 54 may be adjusted up against the die bar 41 and nose die 40 so as to clamp the same rigidly in position. The center
plate 44 is held in position by screws 57 which pass down into the die block 38, as indicated in Fig. 6.

Having thus described my invention, I claim a new and desire to secure by Letters Patent,—

1. A die having longitudinally disposed forming ribs on the face thereof, and a plurality of interchangeable die plates mounted in the face of said die, presenting different patterns and having forming ribs alining with said first ribs and forming continuing extensions thereof, and other die plates removable mounted in the face of said die at intermediate points thereof.

2. A die having grooves in the face thereof, removable ribs formed in sections, said sections having abutting inclined end faces and extending longitudinally in said grooves, said die having a cross groove connecting said first grooves at the junction point of said rib sections, and a removable cross rib adapted to be received in said cross groove and having inclined end faces adapted to abut against the inclined end faces of one of the aforesaid rib sections.

3. A die having grooves in the face thereof, a cross groove connecting said first grooves, removable ribs received in said grooves and formed in sections having inclined abutting end faces, and removable die plates having grooves alining with said first-named grooves, also receiving said ribs, said die plates being adapted to be applied in an angularly displaced position, a removable rib adapted to be supported in said die plates in a cross-wise position connecting said first grooves.

4. A die having grooves in the face thereof, and a die plate seating in the face of said die, having grooves connecting said first grooves, said die plate having a form adapting it to be applied in an angularly displaced position so as to connect said first grooves in a cross-wise direction by means of the grooves of said die plate.

5. A die having grooves therein and having a pocket, a square die received in said pocket and having rabbet grooves in the edges connecting said first grooves, the square form of said die plate enabling the same to be applied in a displaced position whereby said rabbet grooves connect said first grooves in a cross-wise direction.

6. A die having grooves in the face thereof, ribs received in said grooves and formed in sections, said die having a cross groove connecting said first grooves at the meeting point of said rib sections, a removable cross rib adapted to be received in said cross groove, and a second die cooperating with said first die, having grooves in the face thereof cooperating with said first ribs, said second die having a removable die plate set in the face thereof, having grooves normally alining with the grooves of said second die plate, said die plate being of square form whereby it may be set at right angles to its normal position to present a groove cooperating with said cross rib.

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

CHARLES FRIEDRICH STEIBER.

Witnesses:

EDWARD SCHOPPE,

PETER IMHOF.