(No Model.) 2 Sheets—Sheet 1.

W. DUNCAN & A. R. FORDYCE.

DIE FOR MAKING METALLIC LATHING.

No. 594,172. Patented Nov. 23, 1897.

Fig. 1.

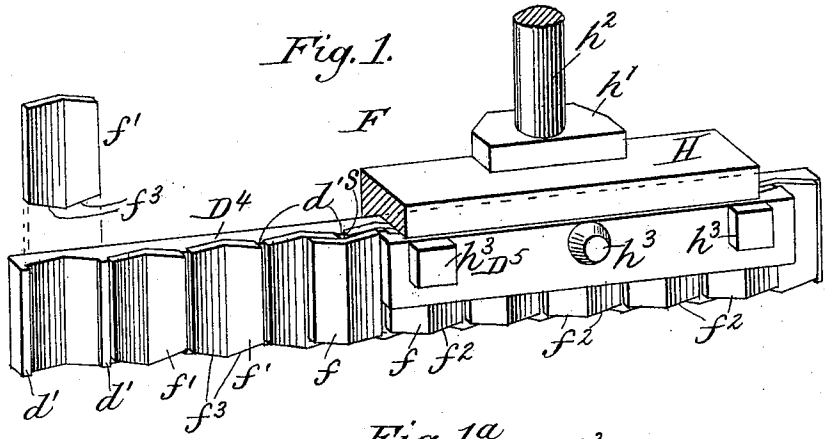


Fig. 1a.

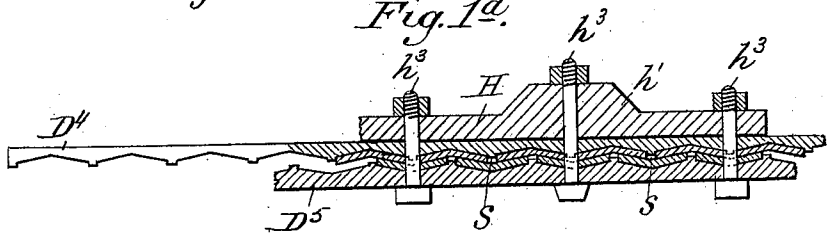


Fig. 4.

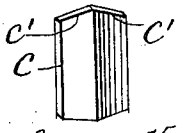


Fig. 5.

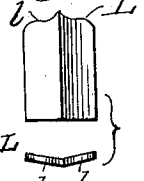


Fig. 3.

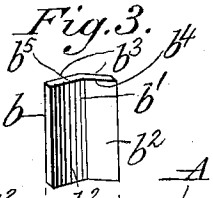


Fig. 2.

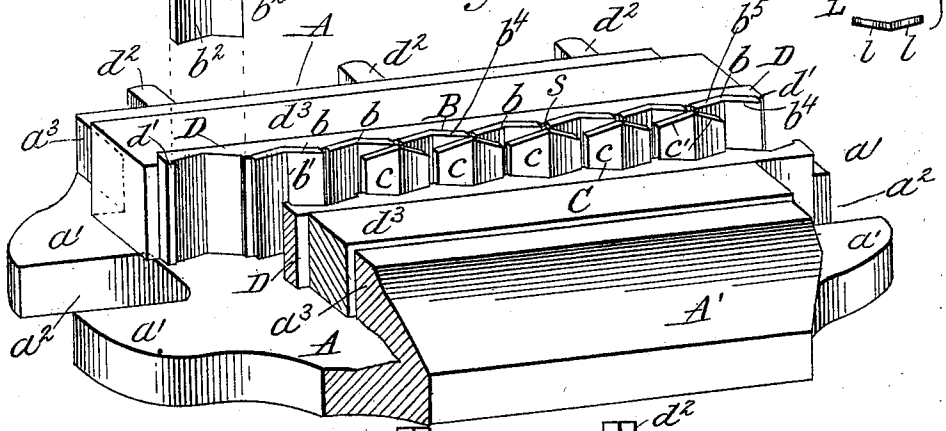
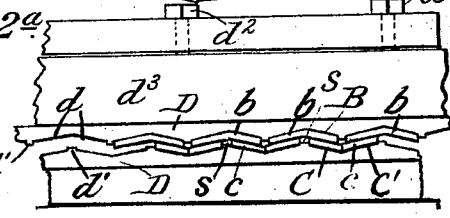


Fig. 2a.



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Fig. 6.

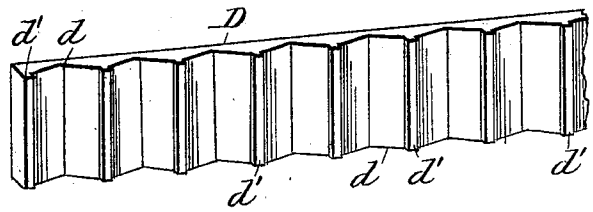


Fig. 7.

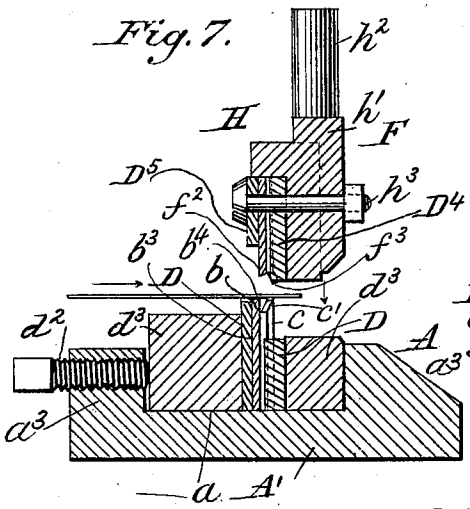


Fig. 7a.

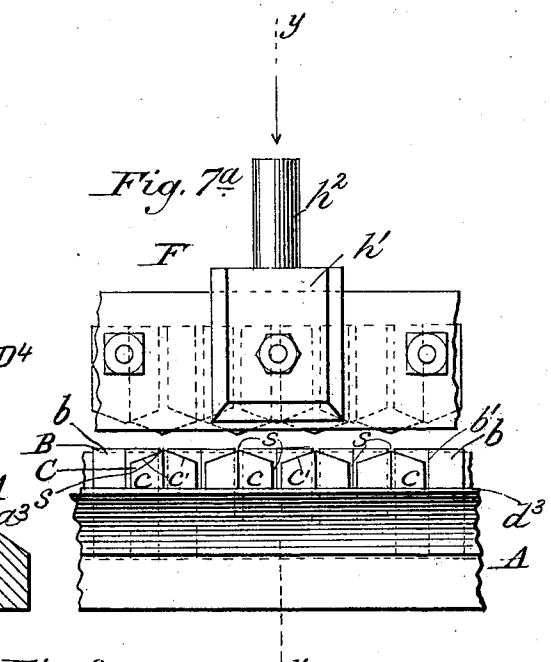


Fig. 8.

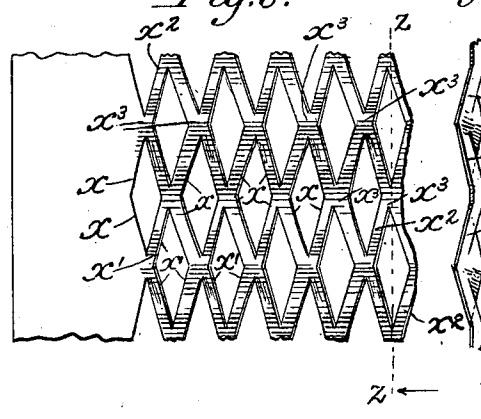
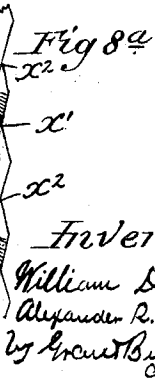


Fig 8a



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UNITED STATES PATENT OFFICE.

WILLIAM DUNCAN, OF KARNEY, AND ALEXANDER R. FORDYCE, OF NEWARK, NEW JERSEY; SAID DUNCAN ASSIGNOR TO SAID FORDYCE.

DIE FOR MAKING METALLIC LATHING.

SPECIFICATION forming part of Letters Patent No. 594,172, dated November 23, 1897.

Application filed August 21, 1896. Serial No. 603,453. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM DUNCAN, residing at Karney, in the county of Hudson, and ALEXANDER R. FORDYCE, residing at Newark, in the county of Essex, State of New Jersey, both citizens of the United States, have invented certain new and useful Improvements in Dies for Making Metallic Lathing, of which the following is a full, clear, and exact description, such as will enable those skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in dies or forming mechanism of that class which are used in the manufacture of metallic lathing; and it more particularly relates to improvements in such a mechanism as can be used in the manufacture of the lathing disclosed in Patent No. 557,658, granted April 7, 1896. The lathing disclosed in the said patent consists, primarily, of a metallic plate provided with rows of angular slits which break joint and are expanded to throw keys from opposite sides of the plate. While the invention will be described in such an embodiment as to make this style of lathing, it can also be used in the manufacture of lathing of different patterns.

The invention in the present instance has for its object the provision of dies or forming mechanism which when brought together on a sheet of metal will cut a double row of angular slits therein, the slits of one row breaking joint with the slits of the other row, and which will expand or force apart the ribs thus formed and thereby form keys projecting from opposite sides of the plate.

The invention consists in the novel construction, combination, and arrangement of parts, such as will be hereinafter fully described, pointed out in the appended claims, and illustrated in the accompanying drawings.

In the accompanying drawings, in which similar letters of reference designate corresponding parts, Figure 1 is a perspective view of the upper member of the dies or forming mechanism, partly in section and partly broken away. Fig. 1^a is a plan sectional view of the upper member. Fig. 2 is a perspective view of the lower member of the dies or forming mechanism, partly in section and partly broken away. Fig. 2^a is a plan sectional view of a portion of the lower member. Fig. 3 is a detail view showing one of the flat-face cutters. Fig. 4 is a similar view showing one of the pointed-face cutters. Fig. 5 is also a similar view showing a cutter with a corrugated face. Fig. 6 is a detail perspective view showing one of the retaining-plates. Fig. 7 is a transverse vertical section showing both members in their proper relative positions. Fig. 7^a is a front elevation of the same, the ends being broken away, however. Fig. 8 is a plan view showing a section of the lathing. Fig. 8^a is a sectional view of the lathing, taken on the line $z\ z$ of Fig. 8.

Referring to the drawings by letter, A and F respectively designate the lower and upper members of the forming mechanism or dies. They are of a length sufficient to operate on a sheet of metal of the desired width. The lower member is provided with any suitable mechanism for securing it to the stationary part of a machine, and the upper member is provided with means for attaching the same to a reciprocating mechanism adapted to operate said upper member in conjunction with said lower member.

There are several styles of sheet-metal-working machines in common use with which the dies can be used, the only essential requirement of such a machine being a table or support on which the lower member can be mounted and immovably secured and a reciprocating mechanism to which the upper member can be attached and moved to bring the two members together. A feed mechanism might also be provided and a clamping mechanism for holding the plate in place while being operated upon; but as a machine possessing these features is common it will not be necessary to more fully describe the same.

The lower die or member of the forming mechanism is mounted in a holder A′, consisting of a casting having a base a, from the ends of which the lugs $a'\ a'$ project. Through the recesses $a^2\ a^2$, formed by these lugs at either end of the casting, bolts may be passed

for securing the holder in place. Projecting from the upper face of the casting and longitudinally of the same are the parallel flanges or offsets a^3 a^3, between which the die proper is fastened. The lower die consists of two sets of cutters B and C, respectively. The set B consists of a series of plates b b, arranged in a line. Each of these plates is made of hardened steel and is angularly bent along its medial line b', and is thereby given the concave and convex faces b^2 and b^3, respectively. The upper edge of the concave face forms the cutting edge b^4. The upper face b^5 is depressed from the cutting edge toward the convex face b^3 to better adapt the cutting edge b^4 to its purpose. The set C consists of a series of plates c c, also arranged in a line. The latter are like those of the set B, except that their cutting edges c' c' are angular instead of straight and that the cutting edge is formed on the convex side of the plate. The two sets of cutters, consisting of the plates b b and c c, respectively, are arranged in parallel lines between the offsets a^3 a^3 of the holder. The plates of each set are placed so as to have spaces s s between their adjacent sides, and they are held in their proper relative positions by a plate D. The latter is provided with a series of concave depressions d d for the reception of the convex faces b^3 b^3. Between two adjacent depressions a rib d' projects. It serves to separate the plates and to hold them in their proper relative positions. The two sets of plates are placed so that the concave sides of one set will be against the concave sides of the other set, and also so that the plates of one set will break joint with the plates of the other set. By "breaking joint" it is meant that the plate in one set overlaps two plates in the other set. The plate D, backing the set C, is cut away to a considerable extent, so as to leave the plates bare at their upper ends, so that they can perform their functions. The cutters and their retaining-plates are seated between the offsets a^3 a^3 of the holder. They are secured therein by the set-screws d^2 d^2, passing through one of the offsets a^3 and impinging against one of the blocks d^3 d^3, between which the cutters and retaining-plates are seated.

The upper member F of the dies or forming mechanism has substantially the same construction as the lower member. It consists of two sets f and f' of cutters, held in their proper relative positions by the plates D^4 and D^5. Both sets of cutters in the upper member have angular cutting edges. In the set f the cutting edges f^2 are on the convex sides of the plates, and in the set f' the cutting edges f^3 are on the concave sides of their respective plates. The relative arrangement of the plates in both members is such that when they are brought together the several cutting edges will register. A somewhat differently-constructed holder is used for the upper member, however. It consists of the angle-iron H, in the angle of which the cutters and their retaining-plates are mounted. They are secured therein by the clamping-plate D^5 and the bolts h^3 h^3, passing through the same and the angle-iron. The latter is secured to the bracket h', and the latter has a shank h^2, by means of which the holder can be secured in the reciprocating mechanism.

The operation of the device is as follows: The two members of the forming mechanism or dies having been mounted in a suitable machine and adjusted so that their cutters will register properly, a sheet of metal is placed between the two dies and the machine set in motion. In actual practice the metal is fed by an intermittent feed, the latter automatically operating to supply between the strokes of the reciprocating die just so much metal as is required for each stroke. This feed mechanism should also be of such a character as to firmly hold the plate while the latter is being operated upon by the dies. When the two members of the forming mechanism are brought together, the cutting edges b^4 of the set of plates B will register with the cutting edges f^2 of the plates f and the cutting edges c' of the set C will register with the cutting edges f^3 of the set f'. It is also to be observed that the registration is such that when the set B registers with the set f the spaces s between the cutters of one set will register with the spaces s of the other set. The same can also be said when the two sets C and f' come together. Furthermore, the spaces of one set are not in line with the spaces of the other set in the same holder, owing to the breaking joint of their respective cutters. The dies on coming together stamp out a complete section of the lathing at one stroke. After the dies separate sufficient metal is fed forward for a second impression. Owing to the double arrangement of the cutters and their breaking joint, when the dies come together for the succeeding stroke the cutters c, forming the set C of the lower die and the cutters of the set f' of the upper die, will cut slits in the plate, which will break joint with the slits formed in the preceding stroke of the dies by the cutters b in the lower die and the cutters f of the upper die. By this arrangement it is seen that it is necessary to feed the plate forward only. In some of the machines now in use the dies are formed of a single line of cutters. This construction requires a double feed of the plate. For a succeeding stroke the plate must not only be fed forward, but it must be fed sidewise, in order that the slits formed by the succeeding stroke will break joint with the slits formed by the preceding stroke. In the device in the present instance this double feed is not required, as the slits made by the coming together of the cutters b in the lower die and the cutters f of the upper die will always break joint with the slits formed by the cutters c of the lower die registering with the cutters f' of the upper die. The metal after it has been operated upon

has an appearance like that shown in Fig. 8. The cuts x are made by the cutting edges b^4 and f^2, and the cuts x' are formed by the cutting edges c' and f^3. The ribs x^2 have the same width as the thickness of the plates forming the cutters. Owing to the spaces s between the cutters, portions x^3 of the metal remain uncut and serve to connect the ribs x^2 and also serve to form the keys of the lathing. The ribs x^2 are substantially angular in outline, owing to the angular bend in the cutters. When the ribs are forced apart to form the mesh and to expand the plate, there must be some give to allow the elongation of the ribs. Instead of the metal stretching or the plate contracting in width as a whole the angularity in the ribs is straightened out to a considerable extent and thereby compensates for the extra length given to the ribs by their forced depression. If the ribs should be straight, the metal in each individual rib would have to stretch or the sheet of metal as a whole would be considerably diminished. It is obvious, therefore, that the finished metal lathing will have substantially the same width as the original sheet and at the same time will be lengthened to a considerable extent.

In Fig. 5 is shown a modification of the cutters. The upper face L of this cutter is corrugated, and consequently the cutting edge l is also corrugated. This cutter is designed to be used when it is desired to produce a lathing having numerous corrugations.

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

1. In a die for making metallic lathing, a holder, and the cutters mounted therein, the latter being arranged in rows so that the cutters of one row break joint with those of an adjacent row, and so that a cutter in one row has a face contacting with the faces of the two opposite cutters in an adjacent row.

2. In a die for making metallic lathing, a holder, and the cutters mounted therein, the latter being angular in cross-section and arranged in rows so that the cutters of one row break joint with those of an adjacent row.

3. In a die for making metallic lathing, a holder, and the cutters mounted therein, the latter being angular in cross-section and arranged in parallel rows so that the cutters of one row break joint with those of an adjacent row, and so that each cutter in one row has its concave face contacting with the concave faces of the two opposite cutters in an adjacent row.

4. In a die for making metallic lathing, a holder, and the cutters mounted therein, the latter being angular in cross-section and arranged in rows so that the cutters of one row break joint with those of an adjacent row, and so that there are spaces between the cutters of each row.

5. In a die for making metallic lathing, a holder, and the cutters mounted therein, the latter being arranged in rows so that the cutters of one row break joint with those of an adjacent row, and so that a cutter in one row has a face contacting with the faces of the two opposite cutters in an adjacent row, and also so that there are spaces between the cutters of each row.

6. In a die for making metallic lathing, a holder, and the cutters mounted therein, each of the latter being bent along a medial line so as to be angular in cross-section, the said cutters being arranged in rows so that those of one row break joint with those of an adjacent row and so that there are spaces between the cutters of each row, with each of which spaces the bent portion of a cutter in an adjacent row registers.

7. In a die for making metallic lathing, a holder, and the cutters mounted therein, the latter being arranged in two parallel rows, one of said rows being formed of cutters having cutting edges in substantially the same plane, and the other row formed of cutters having angular cutting edges.

8. In a die for making metallic lathing, a holder, cutters angular in cross-section mounted therein and arranged in a row, and a retaining-plate having concave recesses formed therein to receive the convex backs of said cutters.

9. In a die for making metallic lathing, a holder, cutters, angular in cross-section, mounted in said holder and arranged in a row with spaces between them, and a retaining-plate having concave recesses formed therein to receive the convex backs of said cutters and having ribs projecting into the spaces between said cutters.

In testimony whereof we affix our signatures in the presence of two witnesses.

WILLIAM DUNCAN.
ALEXANDER R. FORDYCE.

Witnesses to the signature of Duncan:
EMMA I. CARTER,
NATHANIEL R. PORTER.

Witnesses to the signature of Fordyce:
JONATHAN POTTER,
WM. H. POTTER.