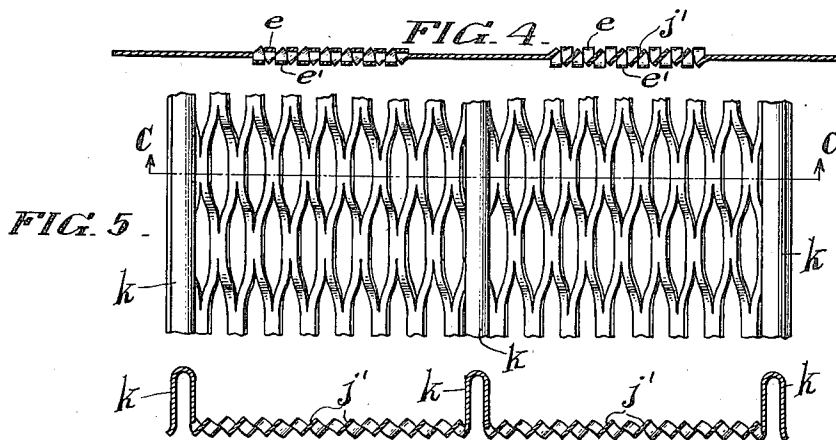
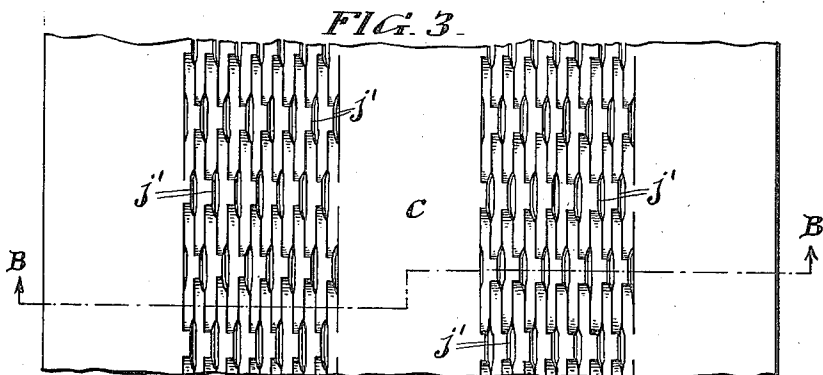
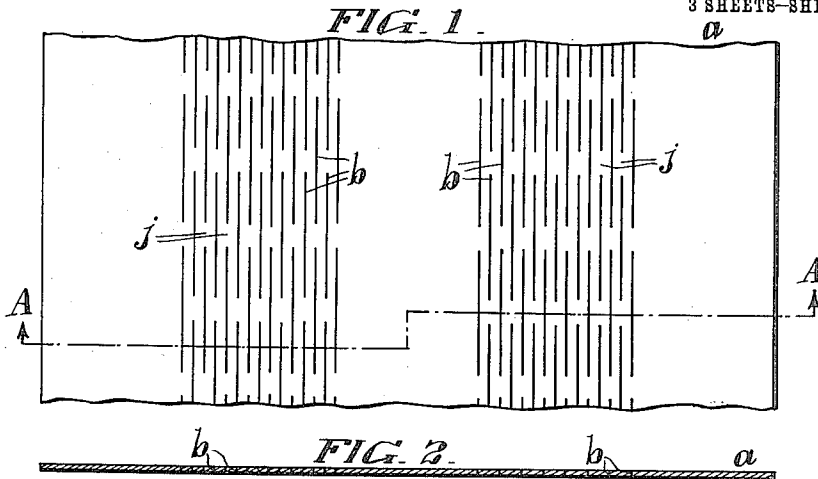


H. B. CHESS, JR.
METHOD OF EXPANDING SHEET METAL.
APPLICATION FILED JAN. 21, 1913.

1,059,710.

Patented Apr. 22, 1913.

3 SHEETS—SHEET 1.



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FIG. 6.

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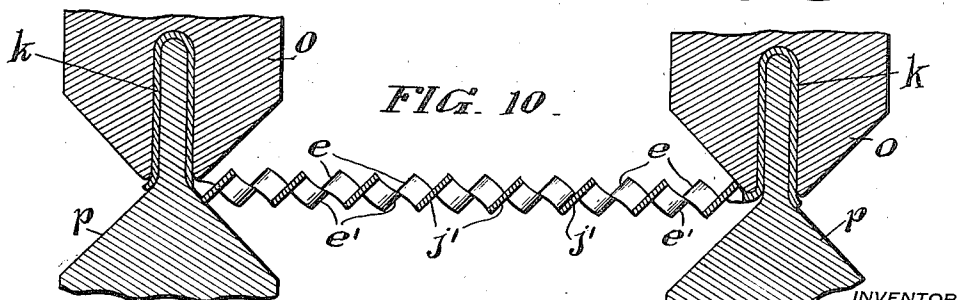
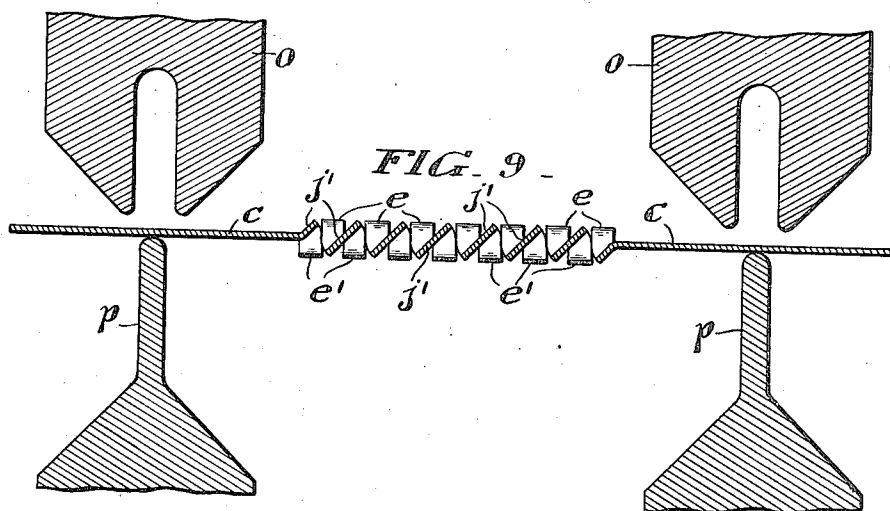
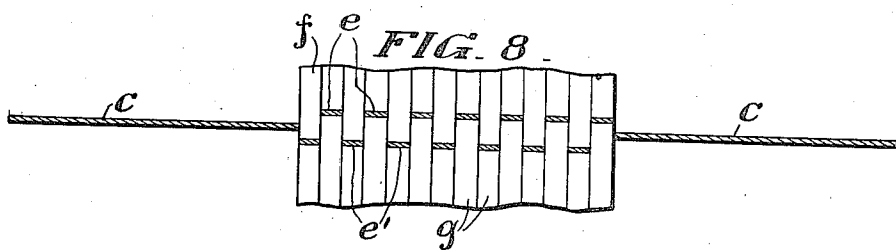
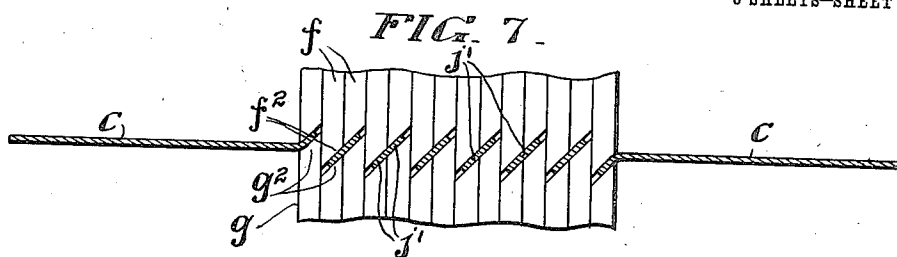
INVENTOR

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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

FIG. 11.

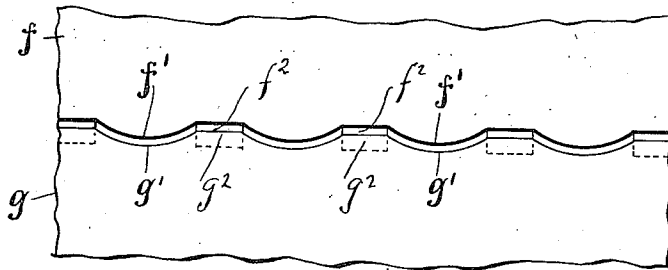
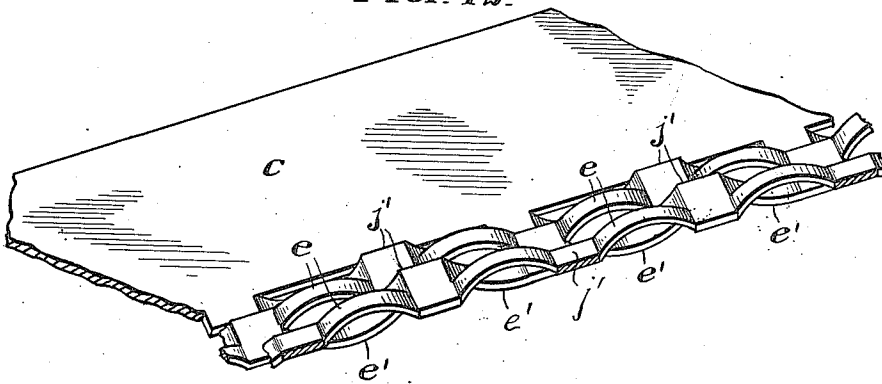


FIG. 12.



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METHOD OF EXPANDING SHEET METAL.

1,059,710.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed January 21, 1913. Serial No. 743,241.

To all whom it may concern:

Be it known that I, HARVEY B. CHESS, JR., a citizen of the United States, and a resident of Pittsburgh, Allegheny county, State of Pennsylvania, have invented an Improvement in Methods of Expanding Sheet Metal, of which the following is a specification.

My method of expanding sheet metal consists essentially in first slitting the sheet to form strands connected by unslit portions, stretching or elongating the strands thus formed, and deploying or pulling away from one another the stretched strands to form open meshes bounded by the stretched strands and the connecting portions. Such metal combines the expansion due to the deploying, or lateral separation, of the strands with the expansion due to the longitudinal extension of the strands resulting from their stretching, and also has the increased tensile strength which results from the stretching operation.

The method is well adapted to making expanded metal of that form in which expanded strips alternate with unexpanded raised ribs, as the formation of the ribs in the unexpanded portions of the sheet may be utilized to impart the lateral tension for deploying or spreading the cut and stretched strands to form the open meshes.

In the drawings: Figure 1 is a plan view of a piece of metal that has been subjected to the preliminary slitting; Fig. 2 is a cross section of the same on the line A—A of Fig. 1; Fig. 3 is a plan view of the same sheet shown in Fig. 1 after the strands have been stretched or expanded; Fig. 4 is a cross section on the line B—B of Fig. 3; Fig. 5 is a plan view of the same sheet shown in Figs. 1 and 3 after it has been opened or deployed; Fig. 6 is a cross section on the line C—C of Fig. 5; Figs. 7 and 8 are diagrammatic views showing the action of the dies in bending and stretching the strands to bring the sheet into the condition shown in Figs. 3 and 4; Figs. 9 and 10 are diagrammatic views showing the action of the dies in opening or deploying the sheet to bring it into the completed condition shown in Figs. 5 and 6; Fig. 11 is a front elevation of a portion of the expanding dies showing their action in stretching, expanding, or elongating the strands; and Fig. 12 is a perspective view of four adjacent lines of stretched or expanded strands before they have been deployed or opened out to form meshes.

A sheet of metal *a* is first slitted in the manner shown in Figs. 1 and 2 to form a plurality of rows of short parallel slits *b* with the slits in alternate positions in successive rows. Such slitting of a sheet has been common practice in some methods of making expanded metal, and may be effected by passing the sheet between suitable cutting rolls.

I have illustrated my process as applied to making sheets of expanded metal having parallel expanded portions with intermediate unexpanded raised ribs, and, therefore, the slitted portions *b* are made in parallel strips separated by intermediate unslitted strips *c*, which latter are formed into the ribs *k* as is hereafter explained. If, however, the sheet is to be expanded throughout, without the intermediate ribs, it will be slit continuously, *i. e.* without any intermediate unslit portions. After the sheet is thus slit it is placed between expanding dies, such as are indicated in Figs. 7 and 8, to stretch or expand the strands *e*, *e'*, which are formed by the slits. As shown, I employ upper and lower sets of dies *f*, *g*, composed of plates arranged side by side in contact. These dies act together to bend, and at the same time, to stretch, expand or elongate the strands *e*, *e'*, oppositely, *i. e.* all the strands in one row are bent, and stretched upwardly while all the strands in the next row are bent and stretched downwardly. To effect this result the dies are formed with complementary scalloped edges *f'*, *g'*, with the scallops projecting in opposite directions in adjacent pairs of dies. In Fig. 11 the dies *f* and *g* are slightly separated. These outer dies act to stretch down the row of metal strands upon which they act, while the dies of the next pair act to stretch up the row of strands upon which they act. At the same time the connecting portions of metal *j* between the slits are bent into an inclined position, as shown at *j'* in Figs. 3, 4, 9 and 12; this is effected by beveling the coacting faces of the dies *f* and *g* between the scalloped portions, as shown at *f''*, *g''*, in Figs. 7 and 11. When the metal strands have thus been stretched or elongated they are deployed or spread apart by pulling the edges of the sheet laterally to form open meshes bounded by the stretched or expanded strands *e*, *e'* and the connecting portions *j'*. So far as concerns the process broadly this lateral expansion or deploying of the stretched and

expanded metal may be effected by any means; but, when the metal is to be made into sheets having expanded strips separated by unexpanded raised ribs, as shown in Figs. 5 and 6, the lateral expansion or deploying may be effected by dies *o*, *p*, as shown in Figs. 9 and 10. These dies act upon the uncut and unexpanded portions *c*, *c* and apply the lateral pull or tension which deploys or opens up the cut and stretched strands into the expanded form, at the same time forming the intermediate raised ribs *k*.

My invention is not limited to any particular mechanism or mechanical means for performing the process, and those mechanical devices shown and described are to be taken merely as illustrative of such devices as may be used for the purpose; for example, it is immaterial to my invention, considered broadly, whether the slitting and stretching operations are performed successively or simultaneously. The essential features of my invention are that the sheet is slit to form strands arranged alternately in adjacent rows, that the strands so formed are stretched or elongated and are then drawn apart or deployed to produce an expanded body, the expansion of which consists both in the longitudinal stretching of the strands and in the lateral spreading of the sheet to form open meshes.

What I claim is as follows:

1. The method of expanding sheet metal, which consists in slitting the sheet in parallel lines of interrupted slits arranged alternately in adjacent lines, stretching longitudinally the metal of the strands formed by the rows of slits, and pulling the sheet later-

ally to deploy the stretched strands into open meshes.

2. The method of expanding sheet metal, which consists in slitting the sheet in parallel lines of interrupted slits arranged alternately in adjacent lines, stretching longitudinally the metal of the strands formed by the rows of slits transversely to the plane of the sheet, and pulling the sheet laterally to deploy the stretched strands into open meshes.

3. The method of expanding sheet metal which consists in slitting a portion of the sheet in parallel lines of interrupted slits arranged alternately in adjacent lines, stretching longitudinally the metal of the strands formed by the rows of slits, and bending the unslit portions of the sheet in a transverse plane to impose lateral tension on the slit and stretched portions and deploy them to form open meshes.

4. The method of expanding sheet metal which consists in slitting the sheet in parallel lines of interrupted slits arranged alternately in adjacent lines, stretching longitudinally the metal of the strands formed by the rows of slits, bending into an inclined position the unslit portions connecting the slits, and pulling the sheet laterally to deploy the stretched strands and the connecting unslit portions into open meshes.

In testimony of which invention, I hereunto set my hand.

HARVEY B. CHESS, JR

Witnesses:

J. C. SHERIFF,
JOHN OMMERT.