Nov. 18, 1924. 1,516,059

E. T. REDDING

PROCESS AND APPARATUS FOR MAKING EXPANDED METAL

Filed Feb. 28, 1921 4 Sheets-Sheet 1

Fig. 1.

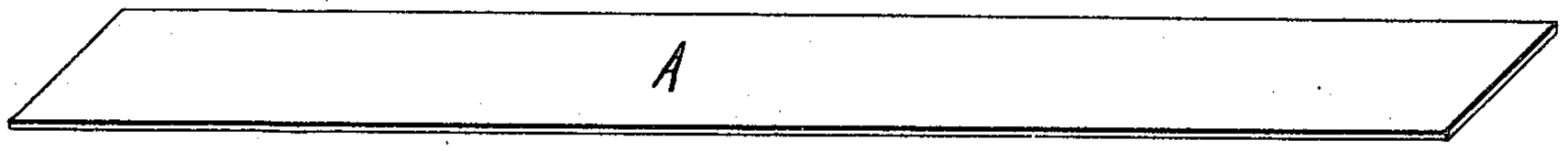
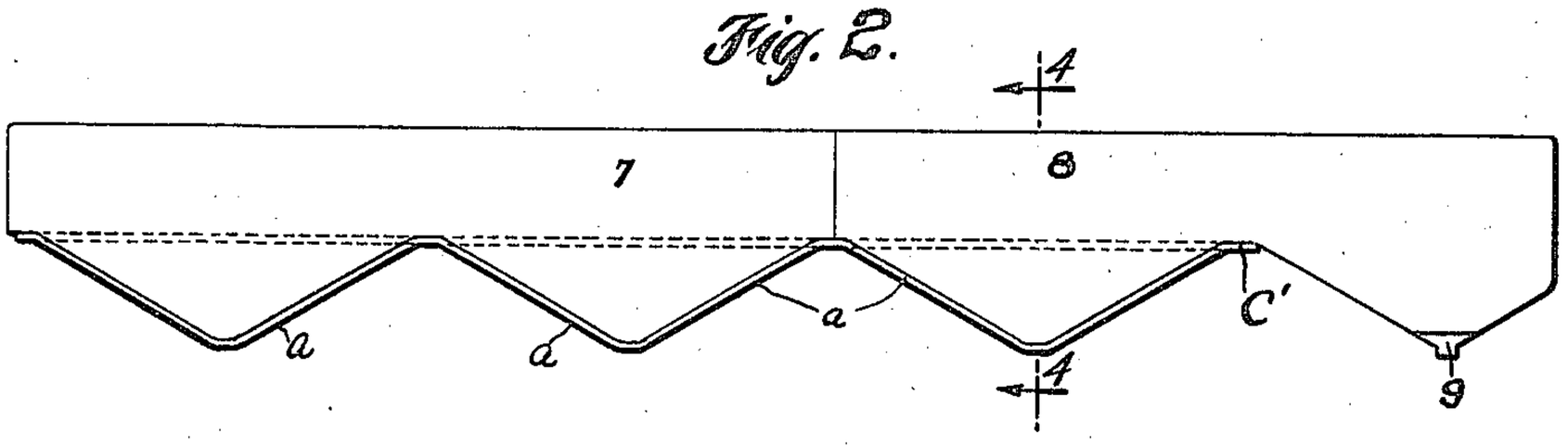


Fig. 2.



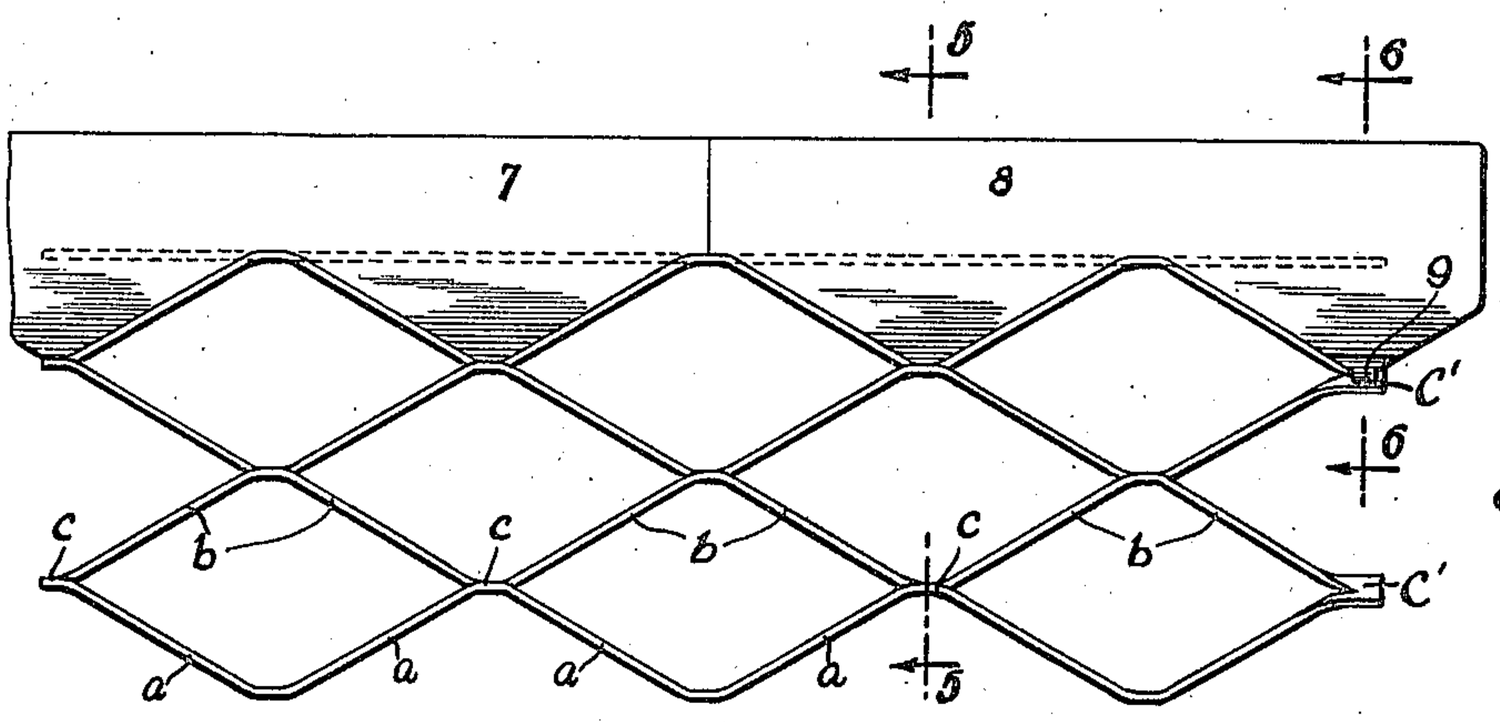


Fig. 3.

Fig. 4.

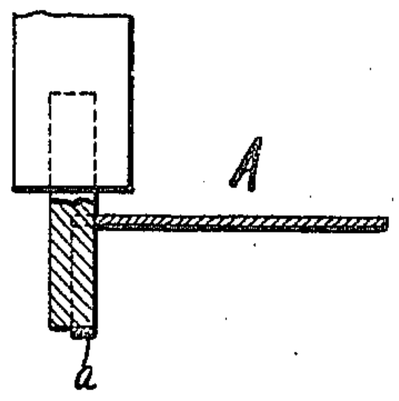


Fig. 5.

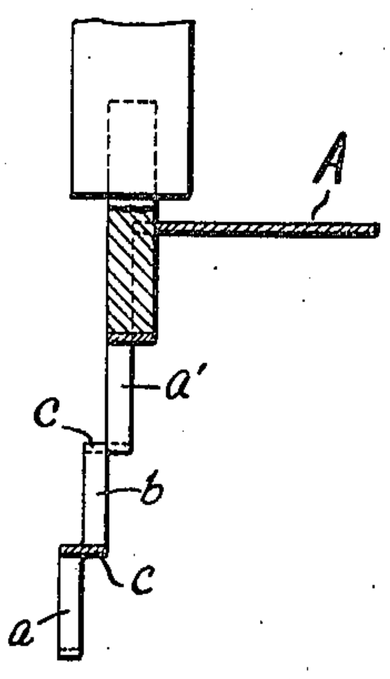
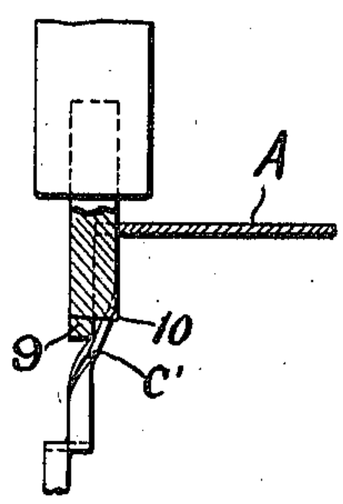


Fig. 6.



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PROCESS AND APPARATUS FOR MAKING EXPANDED METAL

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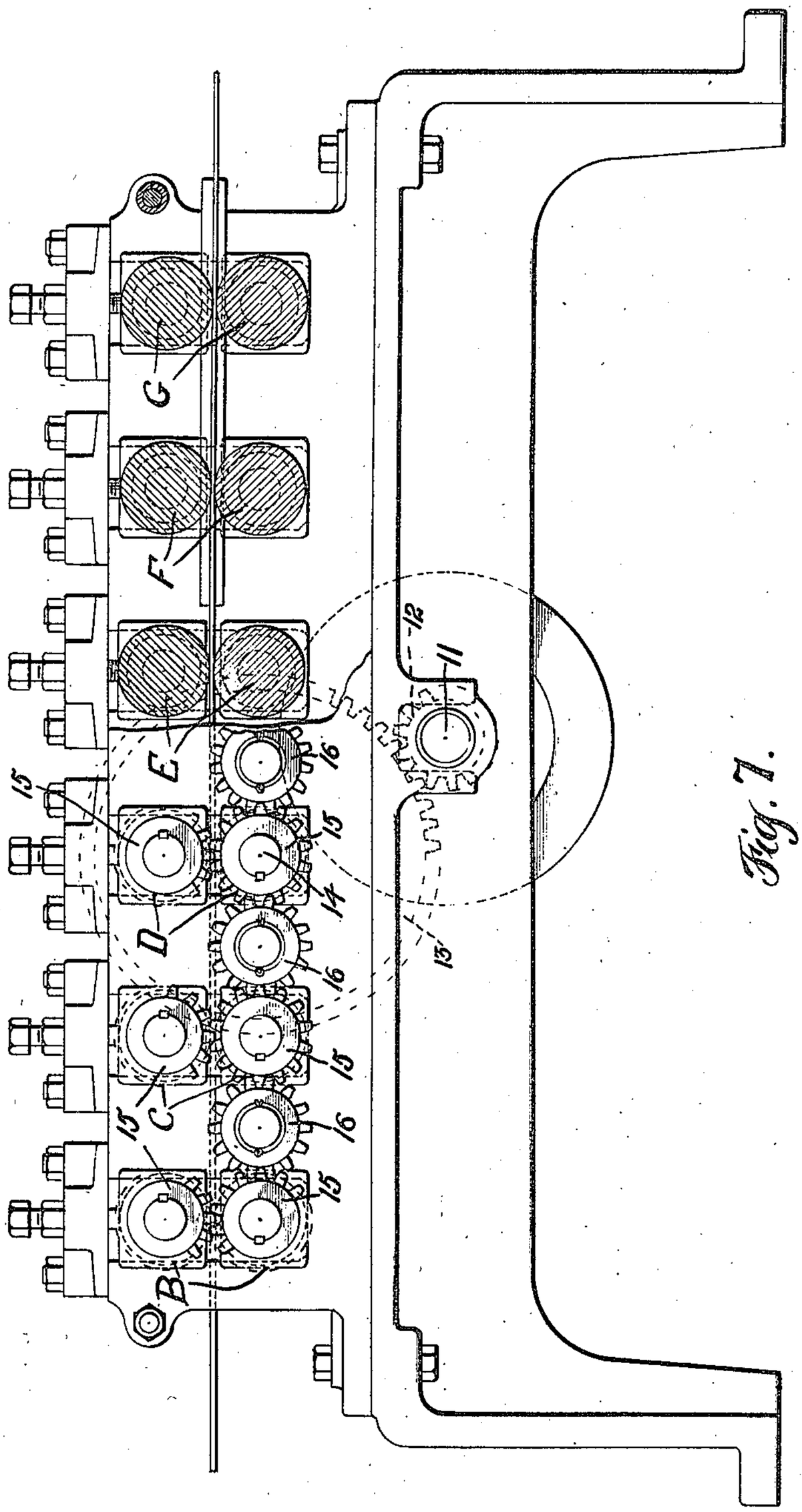

Fig. 1.

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PROCESS AND APPARATUS FOR MAKING EXPANDED METAL

Filed Feb. 28 1921 4 Sheets-Sheet 3

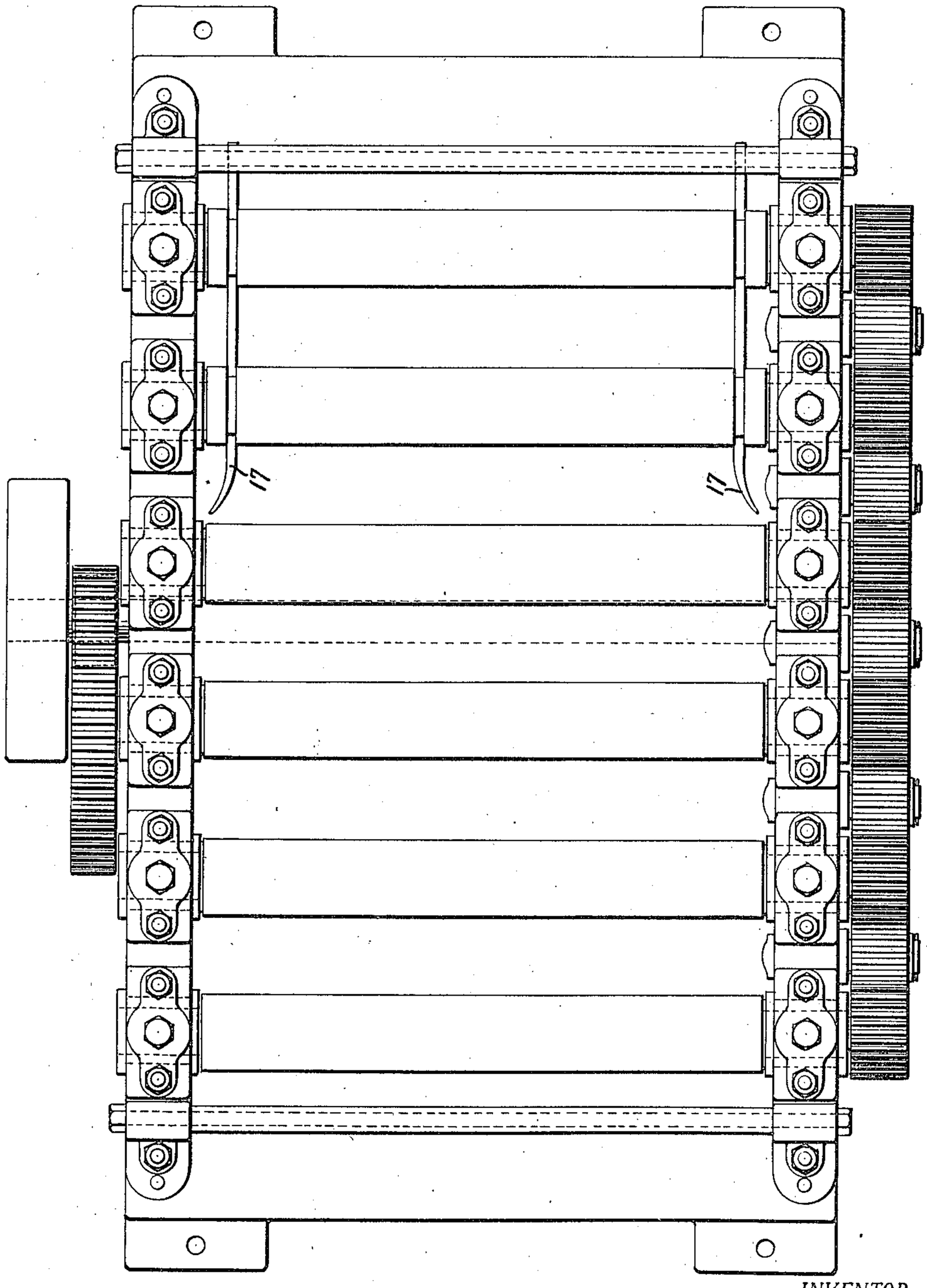

Fig. 8.

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PROCESS AND APPARATUS FOR MAKING EXPANDED METAL

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Fig. 10.

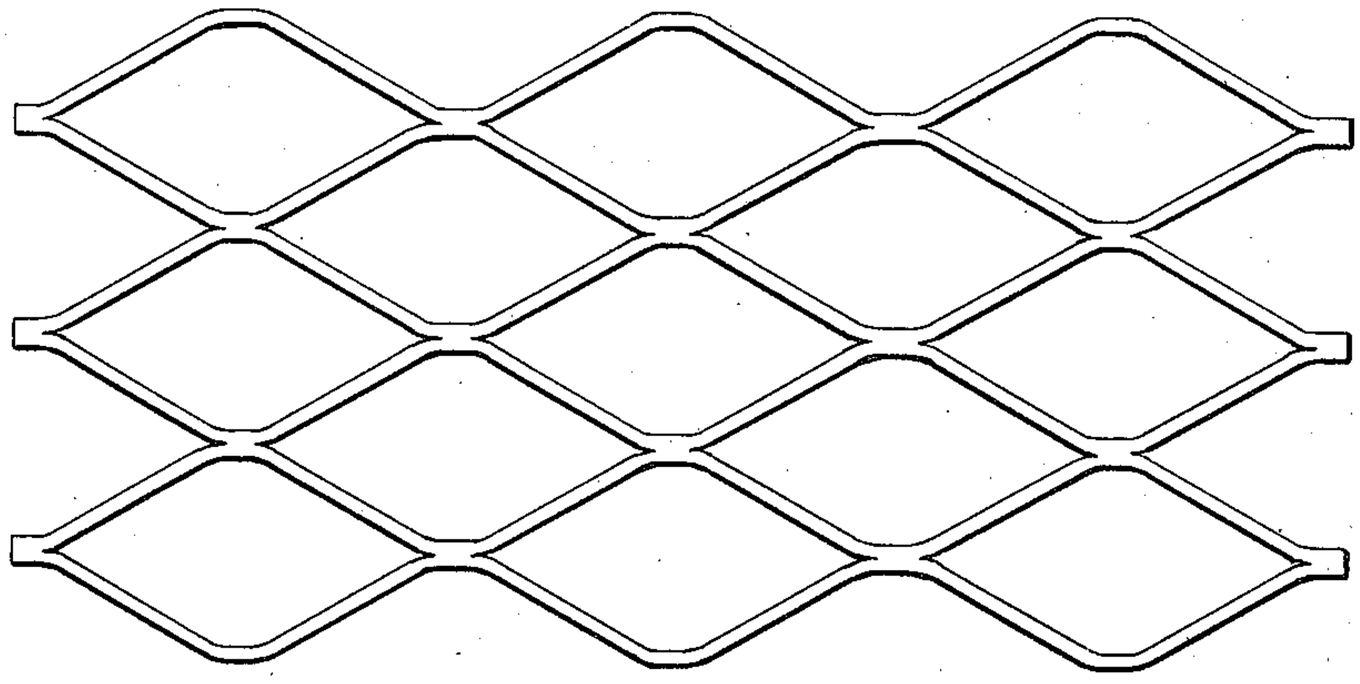
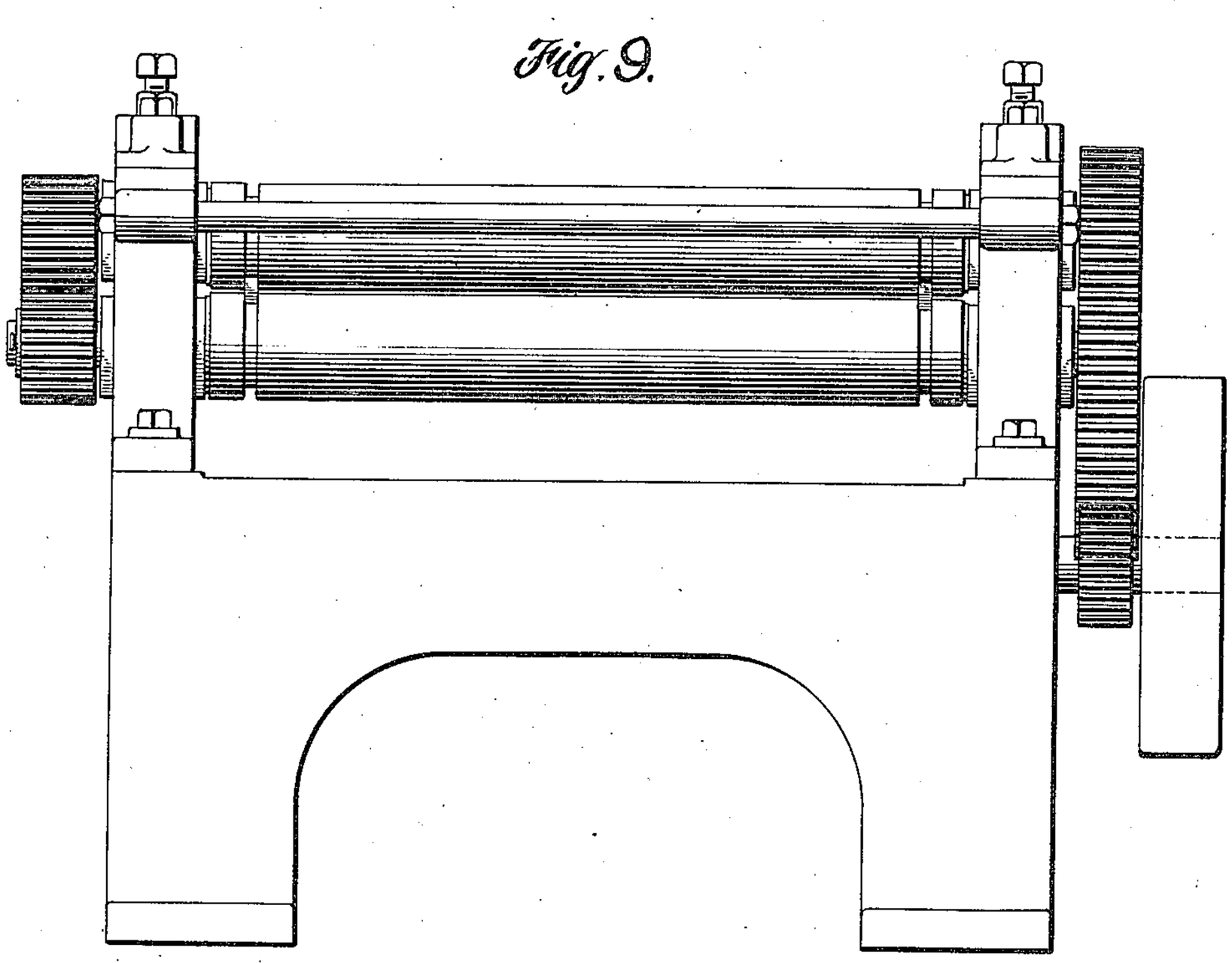


Fig. 9.



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UNITED STATES PATENT OFFICE.

EDWARD T. REDDING, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR TO CONSOLIDATED EXPANDED METAL COMPANIES, A CORPORATION OF PENNSYLVANIA.

PROCESS AND APPARATUS FOR MAKING EXPANDED METAL.

Application filed February 28, 1921. Serial No. 448,401.

To all whom it may concern:

Be it known that I, EDWARD T. REDDING, a citizen of the United States, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Processes and Apparatus for Making Expanded Metal, of which the following is a specification.

This invention relates to a process and apparatus for making expanded metal, particularly the making of a flat sheet of fabric from what is commonly known as "Golding" fabric.

"Golding fabric," in contradistinction to "deployed" fabric, is ordinarily produced on what is known as a "guillotine" machine, from comparatively heavy stock which is sheared to form the strands and connecting bridges. In a sheet of such fabric, the strands and connecting bridges, in the process of manufacture, are formed so as to extend at an angle with respect to the plane of the sheet, considered as a whole, and in fact the bridges and strands are quite nearly vertical to the plane of the sheet, as a result of which the thickness of the sheet is considerably greater than the thickness of the original stock from which it is formed. When such a sheet of Golding fabric has been flattened by turning over the strands and connecting bridges into a single horizontal plane, the thickness of the sheet is greatly reduced and is brought back to and may be slightly less than the thickness of the blank from which the Golding sheet was originally formed, which renders the fabric suitable for many uses for which Golding fabric would be desirable because of its strength while objectionable because of its thickness, and for which deployed fabric is unsatisfactory because of lack of strength and proper physical characteristics. In fact a sheet of flattened Golding fabric is in many respects stronger and has better physical properties than the original sheet of Golding fabric from which it is made because of the additional "working" of the metal which is incident to the manufacture.

Heretofore it has been impossible to so treat a sheet of Golding fabric and turn its strands and connecting bridges into a single plane by means of rolls, and it is the primary object of my invention to provide an improved process and apparatus whereby it is possible to so treat a sheet of such fabric in a rolling machine.

Another object of the invention is to produce such a flattened sheet with the width which is desired.

The foregoing, together with such other objects as may hereinafter appear, or are incident to my invention, I obtain by means of a process and apparatus illustrated in the accompanying drawings, wherein:

Figure 1 is a perspective of a blank from which Golding fabric is to be made; Figure 2 is a side elevation of two of the dies of a guillotine machine and illustrates their operation on the blank shown in Figure 1; Figure 3 is a view similar to Figure 2 showing how the blank is sheared by the dies to form the expanded fabric and also illustrating how the end of the sheet may be treated in carying out my invention; Figure 4 is a section taken on the line 4—4 of Figure 2; Figure 5 is a section taken on the line 5—5 of Figure 3; Figure 6 is a section taken on the line 6—6 of Figure 3; Figure 7 is a side elevation and partial section of the rolling machine I prefer to use in carrying out my invention; Figure 8 is a plan view of the machine shown in Figure 7; Figure 9 is an end elevation of the right hand end of the machine shown in Figure 7; and Figure 10 is a plan view of the completed product.

Referring now to Figures 1 to 6, inclusive, A is a blank of sheet metal of the desired dimensions to produce a sheet of Golding fabric of the intended size; the reference numbers 7 and 8 indicate the end two dies of the row of dies employed in the usual guillotine machine, such dies being shown in the position in which they shear off the strands marked *a* in Figures 2 and 3. For the next operation, the member carrying the dies is shifted to the left, so that the dies are in the position shown in Figure 3 to form the strands *b* and connecting bridges *c*. For the next operation the parts will be brought back to the position shown in Figure 2 and strands *a'* and connecting bridges *c* would be formed, and so on until the whole sheet is completed. From examination of Figure 5, it will be seen that the strands and

connecting bridges, considering the sheet as a whole, extend at an angle, to the plane of the sheet, approaching the vertical.

Such a sheet cannot be passed between rolls, but I have discovered that this may be successfully done if the end connecting bridges *c'* be turned over so as to be substantially parallel to the plane of the sheet. This may be done in a number of ways, but in the drawings I have shown a means whereby it may be accomplished while the sheet is being made. I provide the end die 8 with a projection or nose 9. When the dies are in the position shown in Figure 2 the outer end of the die 8 performs no work; but when the die is in the position shown in Figure 3, the edge 10 will cut the blank directly behind the connecting bridge *c'* and thus shear off this bridge *c'* from the blank A, while the projection 9 will twist such connecting bridge, turning it into the plane of the sheet, as will be seen from inspection of Figures 3 and 6.

If now a sheet of Golding fabric having its end bridges turned as indicated, be thrust or held in the pass of a pair of rolls, the rolls will take the sheet and pass the same therebetween, turning over the strands and connecting bridges into the plane of the sheet, the number of passes required being dependent upon the particular fabric being treated and the degree of flattening, and in some instances reduction, required. I prefer to carry out the flattening operations as now to be described.

Referring now to Figures 7, 8 and 9, it will be seen that I have therein illustrated a machine comprising a suitable base and frame in which are mounted the pairs of rolls B, C, D, E, F and G, such rolls being driven from the main shaft 11 through pinion 12, gear 13, shaft 14, gears 15, and idlers 16, in a manner which will be readily understood. The upper roll of each pair is adjustaby mounted, and in practice I prefer to graduate the passes of the pairs of rolls B, C, D and E, the rolls B being furthest apart and the rolls E closest together. In passing through the successive pairs of rolls, the sheet of fabric has its strands and connecting bridges turned over more and more until they have been flattened into the plane of the sheet, the sheet as it leaves the pair of rolls E being in the form indicated in Figure 10.

The rolls F and G are primarily intended to support the already flattened sheet while it is being reduced to proper width. During the flattening process the sheet may be slightly widened, as well as slightly elongated, depending upon the amount of work performed on the sheet. Within practical limits the width of the sheet may be controlled and made uniform by arranging a pair of guide members 17 between the pairs of rolls F and G and extending from a point adjacent the pair of rolls E to the end of the machine. The inner ends of these guide members are flared outwardly so as to receive the sheets and they are spaced apart to produce the desired width of sheet, the rolls F and G being preferably spaced apart the same distance as are the rolls E. The sheet in passing between the rolls F and G is supported across its width so that it cannot buckle, thus insuring that the shortening in width shall take place without distorting the sheet and making it wavy. The rolls F and G may also serve as levelers in case there should be any tendency toward curling.

I claim:

1. The herein described process of producing a substantially flat sheet of metallic fabric from a previously formed sheet of Golding fabric which consists in turning over the end portions of the sheet of Golding fabric approximately into the plane of the sheet to be formed and in passing the sheet through rolling means to turn over the strands and connecting bridges.

2. The herein described process of producing a substantially flat sheet of metallic fabric from a previously formed sheet of fabric having strands and connecting bridges extending at an angle with respect to the general plane of the sheet which consists in turning over the end portions of the sheet approximately into the plane of the sheet to be formed and then in passing the sheet through rolling means to turn over the strands and connecting bridges.

3. The herein described process of making expanded metal fabric which consists in forming a sheet having strands and connecting bridges at an angle to the general plane of the sheet and the portions at one end extending approximately in the plane of the sheet, and in flattening the sheet by introducing said end between rolling means and passing the sheet therethrough.

4. The combination with a guillotine machine for making expanded metal fabric of the Golding type, of means for turning over connecting bridges of the fabric sheet formed in the machine into approximately the plane of the sheet.

5. The combination with a guillotine machine for making expanded metal fabric of the Golding type, of means for turning over the end connecting bridges of the fabric sheet as it is being formed into approximately the plane of the sheet.

6. The combination with a guillotine machine for making expanded metal fabric of the Golding type, of means for turning over the end connecting bridges of the fabric formed, during the cutting of the blank directly behind such bridges.

7. In a machine for treating expanded

metal fabric of the Golding type, the combination of a plurality of pairs of flattening rolls, certain of which have diminishing passes, and the remainder substantially the same pass.

8. In a machine for treating expanded metal fabric of the Golding type, the combination of a plurality of pairs of flattening rolls, certain of which have diminishing passes, and the remainder substantially the same pass, together with the means adjacent the latter for determining the width of the sheet being treated.

In testimony whereof, I have hereunto signed my name.

EDWARD T. REDDING.