July 23, 1929. M. COMBEMALE 1,722,177

METHOD OF MANUFACTURING METAL FURNITURE AND PRODUCTS RESULTING THEREFROM

Filed April 19, 1927 2 Sheets-Sheet 1

Fig. 1.

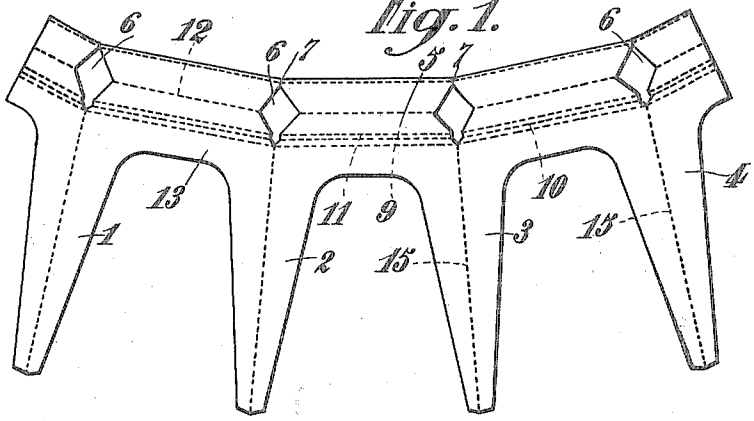


Fig. 2.

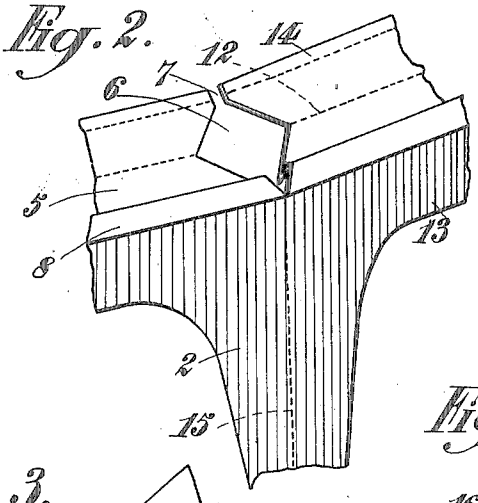


Fig. 3.

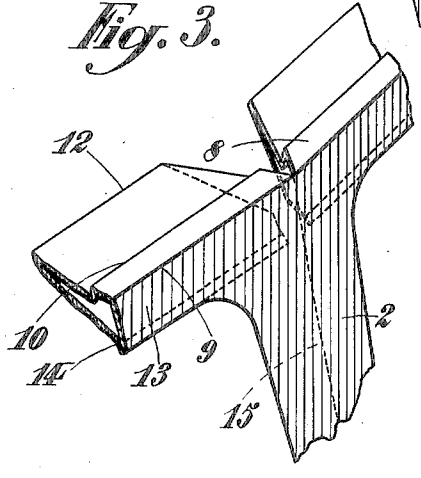
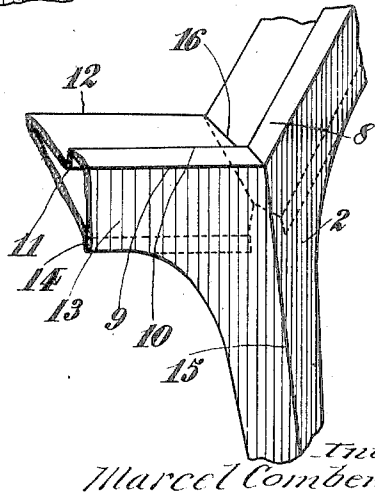


Fig. 4.



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July 23, 1929. M. COMBEMALE 1,722,177

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Filed April 19, 1927 2 Sheets-Sheet 2

Fig. 5.

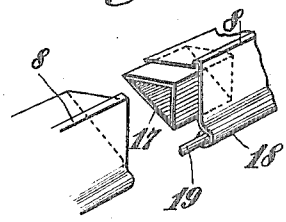


Fig. 6.

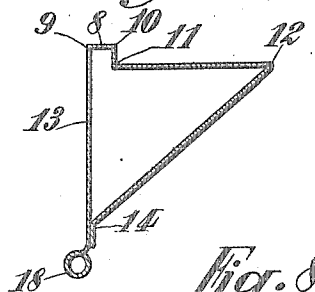


Fig. 8.

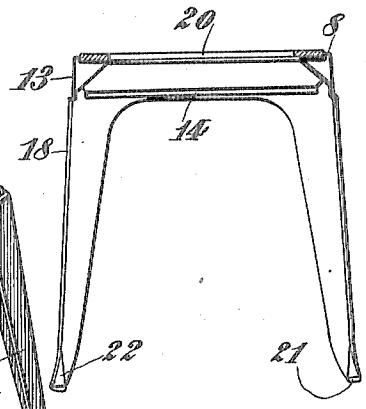


Fig. 7.

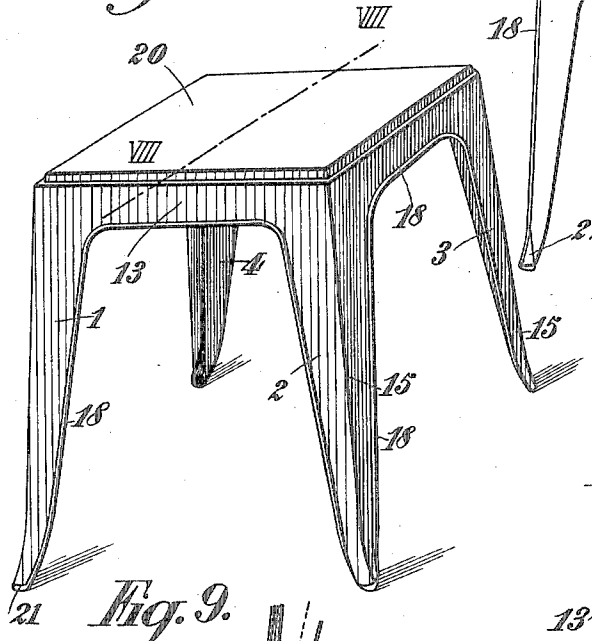


Fig. 9.

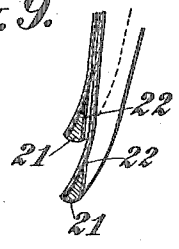
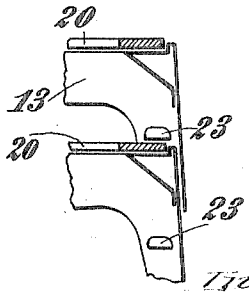


Fig. 10.



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UNITED STATES PATENT OFFICE.

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METHOD OF MANUFACTURING METAL FURNITURE AND PRODUCTS RESULTING THEREFROM.

Application filed April 19, 1927, Serial No. 185,016, and in France May 6, 1926.

The present invention relates to the manufacture of metal furniture and its object is to enable this to be done in a rational manner, rapidly and economically and to ensure for the furniture obtained with this process considerable resistance as well as great rigidity.

The invention applies to all furniture made out of metal, such as seats, tables, cupboards, and the like, the sides or frame of which are developable and, consequently, are capable of being cut out by a press, the blank thus obtained being then bent over along determinate lines and soldered along the joining lines so as to form the finished article. According to their sizes, these articles may thus be made in one or several parts assembled together by soldering.

The invention consists in cutting out one or several blanks the shape of which is determined by the development of the surfaces of both the articles of furniture and a reinforcing chamber forming an integral part of said article of furniture, in bending over the blank or blanks along determinate lines to form the edges of the article of furniture and along other lines to form the reinforcing chamber, in closing together certain of said edges so as to give the article of furniture its final form, and in securely fixing said closed edges together.

The invention consists, furthermore, in forming, by bending, a shoulder on the outer part of this frame, which shoulder surrounds a hollow intended to house a panel of suitable dimensions and made of any appropriate material.

According to a particular form of application of the invention, to articles of furniture that can be piled up on each other, the ends of the legs are bent outwards and provided with a sound proof lining which is kept in place by a plate soldered in the hollow of the leg and offset from the axis of the internal edge of this leg.

Finally, stops are provided for limiting the extent to which the articles fit into each other when they are piled up.

A form of embodiment of the invention is represented, but merely by way of example on the appended drawing, which shows how the invention is applied to the manufacture of a metal stool.

Fig. 1 shows a blank of the developed surface of a stool, which is cut out so as to form in a single piece the frame of the seat and the four legs of a stool.

Figs. 2 to 4 show the successive stages in the bending of the blank in order to give the stool its final shape.

Fig. 5 is a perspective view showing how the two joined extremities of the reinforcing frame are assembled.

Fig. 6 is a view on a larger scale of the tubular frame.

Fig. 7 is a perspective view of a stool made according to the invention.

Fig. 8 is a section along VIII—VIII, Fig. 7.

Fig. 9 is a detail view showing how the ends of the legs are preferably shaped in view of articles being piled on each other.

Fig. 10 shows a device which may be employed in order to limit the extent to which the articles fit into each other when they are piled up.

It would naturally be possible, when the manufacture of tables or stools by the method of cutting out and bending is involved, to form, at the time when the surfaces of these articles of furniture are developed, the slabs of the tables or the seats of the stools, i. e. it would be possible to manufacture the whole article of furniture in one piece. But, in the majority of cases, it is preferable to obtain in this manner only the frame of the seat or of the slab, in one piece with the legs, the seat or the slab itself being made advantageously of a material other than metal, for example, wood, leather, cane and the like. It is for this reason, that in the example shown, only the method of simultaneously making the legs and the frame has been given.

The surface of the piece of furniture is developed by means of a tracing such as that of Fig. 1. In this example it has been supposed that the article of furniture (a four-legged stool) was in one piece, but it is easily understood that it would be a simple matter to make it in two (or several) pieces, by developing the blank to half (or a fraction) the extent shown. The four legs which are joined at their upper end by a metal hoop 5 intended to form the band of the seat and the reinforcing frame are developed as may be seen at 1, 2, 3 and 4. In this hoop recesses 6 have been made enabling the metal to be suitably bent over without overlapping, so as to form the reinforcing chamber, the units of this member being separated one from the other by a slit

at 7. The blank being thus cut out, it is bent over mechanically in the following manner: The shoulder 8 is first formed along the lines 9, 10 and 11, the hoop 5 is then bent over along the line 12 so as to bring its outer portion below its inner portion, and the edge 14 is turned down against the band 13 of the legs. In this way a tubular portion of triangular section is formed, which is to constitute the reinforcing chamber or frame of the seat. Finally, the legs 1, 2, 3 and 4 are bent over along their median line 15 so as to give them their final form. Whilst these legs have been bent over, the ends of the frame sections have come together until they meet, as may be seen at 16, Fig. 4 and they are soldered together so as to maintain them in position. Furthermore, the edge 14 of the tubular chamber or frame is soldered to the band 13 and this edge is thus finished off on the form shown in Fig. 6.

The two joined ends of the frame may be assembled together, as shown in Fig. 5, by means of a core 17 of corresponding shape, which is engaged simultaneously in each of these ends and then soldered.

In order to make the whole more rigid, the edge of the sides of the piece of furniture may with advantage be rolled. In the example shown, the edges of the legs 1, 2, 3 and 4 and of the band 13 are rolled as may be seen at 18 and a wire 19 of suitable diameter is passed through this rolled edge.

The seat is completed by laying a movable panel 20 made of suitable material (wood, agglomerate and the like) in the frame formed by the shoulder 8. This panel may moreover be secured in position by means of bolts or in any other manner.

It will be understood that it would only be necessary to make the legs of the stool, manufactured according to the invention, oblique to a certain extent, as for example those shown in Figs. 7 and 8, so as not only to render the piece of furniture more stable but also to enable the stools to be piled up more easily the ones on the others, which is perhaps very much to be desired in order to diminish the bulk either for transport or storage purposes. This mode of procedure has long been in use, but, in the case of the stool described above, wedging must be avoided when the articles are piled up, for this would render it more difficult to unpile the stools and there would be a risk of damaging them. For this purpose, the extent to which these chairs are piled up is limited by means of stops such as angles 23 soldered for example at the upper end of the hollow part of the legs, as may be seen in Fig. 10. In addition, the ends of the legs are bent outwards so that a lining 21, made of solid but sound-proof material (hardened rubber, wood and the like) may be lodged therein without hindering the articles from being piled on top of each other, this lining being maintained in place by a metallic plate 22 soldered on the inner face of the leg and outside the axis of the inner edge of the leg. Finally, in order that the furniture may be piled up as easily as possible, the rolled edge 18 is displaced to the outside as shown in Fig. 6.

It would of course only be necessary to provide these stools with backs of suitable shape to transform them into chairs or armchairs, these backs being fixed or movable and, in the first case, being fixed by soldering or by bolts or rivets.

This method of manufacture is not only applicable to seats as has just been described, but also to tables, cupboards, doors and the like, the solidity and rigidity of which would be increased by the tubular reinforcing chamber as has been indicated.

It may likewise be applied to furniture the horizontal projection of which is a polygon, although, in the example shown, a seat has been described having a square as its horizontal projection.

Various modifications of detail might be made in the above arrangement without changing the spirit of the invention; thus the different units might be assembled not only by soldering but in any other manner and, for example, by riveting, hooking and the like.

I claim:

1. Method of manufacturing metal furniture the surface of which is developable, consisting in cutting out a blank of shape determined by the development of the surfaces of both the frame of said article of furniture and of a tubular reinforcing chamber intended to form an integral portion of said article or furniture, in bending over the blank along determinate lines to form the edges of the frame portion of said article of furniture and along other determinate lines to form the tubular reinforcing chamber, in forming a shoulder on the outside of said reinforcing chamber to provide a ledge extending around the border thereof, in joining together the ends of said reinforcing chamber, and in soldering said ends together.

2. Method of manufacturing metal furniture the surface of which is developable, consisting in cutting out a blank of shape determined by the development of the surfaces of both the frame of said article of furniture and of a tubular reinforcing chamber intended to form an integral portion of said article of furniture, in bending said blank along determinate lines to form legs to said article of furniture and along other determinate lines to form said tubular reinforcing chamber, in bending the ends of said legs outwards and in packing therein a sound-proof lining.

3. Method of manufacturing metal furniture the surface of which is developable, consisting in cutting out a blank of shape determined by the development of the surfaces of both the frame of said article of furniture

and of a tubular reinforcing chamber intended to form an integral portion of said article of furniture, in bending said blank along determinate lines to form the legs of said article of furniture and along other determinate lines to form said tubular reinforcing chamber, in forming a shoulder on the outside of said reinforcing chamber to provide a ledge extending round the border thereof, in bending the ends of said legs outwards, and in packing therein a sound-proof lining.

4. A seat structure having a developable surface and comprising a frame portion including legs and a reinforcing chamber integral with said frame portion.

5. A seat structrue having a developable surface and comprising a frame portion, legs thereto, a tubular reinforcing chamber integral with said frame portion, a ledge forming shoulder extending round the outer edge of said reinforcing chamber and within which a panel may be lodged.

6. A seat structure having a developable surface and comprising a frame portion, legs to said frame portion, with outwardly turned ends thereto, a sound-proof lining inserted in the outwardly turned ends of said legs, a totally enclosed reinforcing chamber integral with said frame portion, and a ledge forming shoulder extending round the outer edge of said reinforcing chamber and within which a panel may be lodged.

7. An article of furniture the leg and frame portion of which is made from a single sheet of metal, the seat portion of which adjacent the leg being recessed to permit the meeting of the edges, and the inner edge thereof being folded to provide a reinforced annular receptacle and seat receiving ledge.

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