(No Model.)

J. R. JACKSON.

MODE OF MANUFACTURING SHEET METAL.

No. 418,370. Patented Dec. 31, 1889.

Fig. 1.

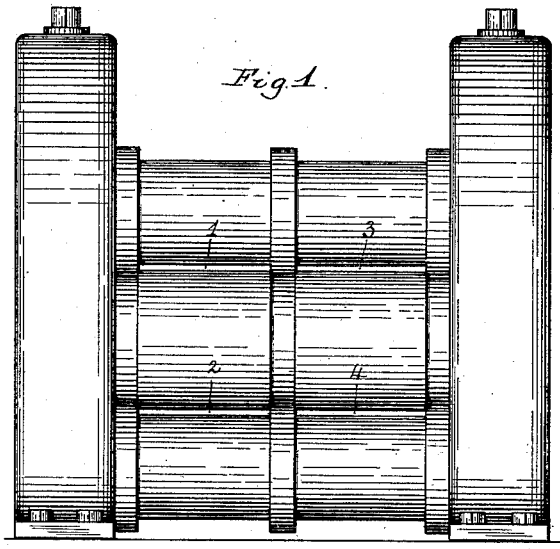
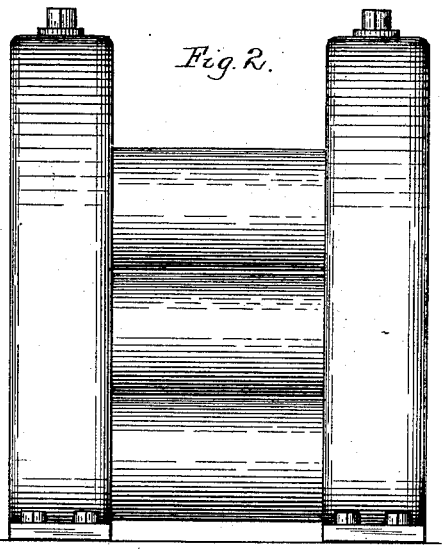


Fig. 2.



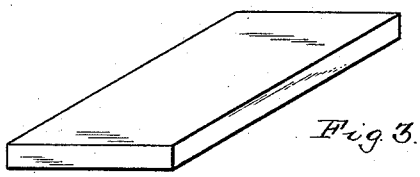


Fig. 3.

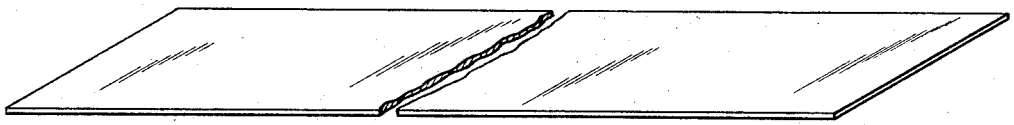


Fig. 4.

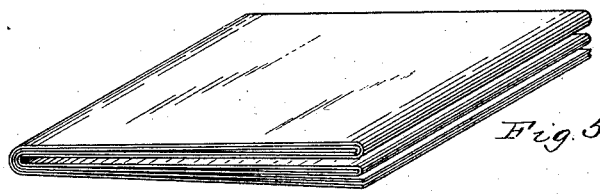


Fig. 5.

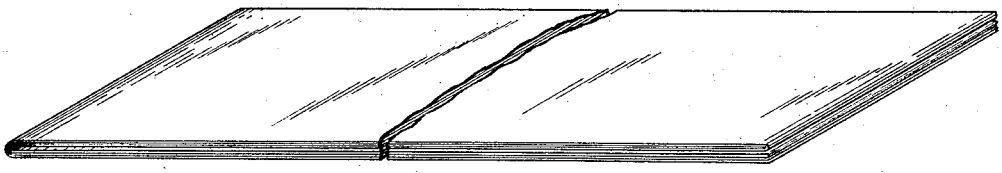


Fig. 6.

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JOSEPH R. JACKSON, OF PITTSBURG, PENNSYLVANIA.

MODE OF MANUFACTURING SHEET METAL.

SPECIFICATION forming part of Letters Patent No. 418,370, dated December 31, 1889.

Application filed June 5, 1889. Serial No. 313,159. (No specimens.)

To all whom it may concern:

Be it known that I, JOSEPH R. JACKSON, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Sheet Metal; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the manufacture of sheet metal, being specially applicable to the making of sheet iron or steel, its object being to provide a means for forming sheet metal rapidly and at a low cost.

Heretofore in the manufacture of sheet iron or steel the following have been the ordinary steps practiced: From a suitable pile or bloom a flat bar has been rolled out, the bar being generally from three-eighths of an inch to an inch thick, and this bar was then cut into lengths corresponding substantially to the width of the finished sheet to be produced. The short bars were then reheated in a suitable furnace and were fed either singly or in pairs crosswise to suitable plating-rolls and reduced by such rolls to plates or thick sheets having a length of about two to three feet. Several of these plates were then piled to form a pack, and the pack so formed was reheated in a suitable furnace and fed to plating-rolls and the pack of plates rolled out into sheets of the desired gages. The pack was then trimmed on the sides and ends, so producing the finished sheet metal of the gage desired. By this method it is seen that several reheatings of the metal are required, this reheating being expensive, as it requires skilled and highly-paid labor, and that the cost of manipulation is large, while the output obtained in any ordinary plant is but small.

By my invention I am enabled to reduce the cost of manufacture and to largely increase the output from an ordinary plant, as will be seen from the description thereof hereinafter given.

My invention consists, generally stated, in forming sheet metal by first rolling a slab, bloom, or pile to a suitable sheet of thick gage and of sufficient length to produce several finished sheets, then forming a package of several sheets obtained from such long sheet, reheating the package, and reducing the sheets therein to the proper gage.

It also consists in folding the long sheet so obtained into a package formed of several folds of the same sheet, reheating this package, and rolling it out to the proper gage and trimming the package to produce the finished sheet, as well as in other improvements, as hereinafter described.

To enable others skilled in the art to practice my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a face view of groove-rolls, and Fig. 2 is a like view of a set of plating-rolls suitable for practicing my invention. Fig. 3 is a perspective view of the slab from which the sheet metal is to be formed. Fig. 4 shows the sheet of thick gage reduced from this slab. Fig. 5 shows the sheet folded into a package ready for rolling into sheets; and Fig. 6 shows the finished package rolled out ready for trimming, the lines on which it is trimmed being indicated by dotted lines on the sheet.

Like letters of reference indicate like parts in each.

In practicing my invention I take a pile, slab, or bloom of iron or soft steel, as may be desired, this slab being of practically the width of the desired sheet metal to be formed, allowing for the usual shrinkage in rolling, such slab being shown in Fig. 3. This slab is then brought to the proper heat, and is first reduced in tongued groove-rolls such as shown in Fig. 1, the rolls shown in said figure being what are known as "three-high groove-rolls," and having the passes 1, 2, 3, and 4 therein, and the slab is rolled through these passes, if necessary two or more sets of these rolls being employed, the slab being reduced and elongated in these groove-rolls until brought to a plate, and then at the same heat being fed to the plating-rolls shown in Fig. 2, and the plate being by several passes drawn out in said rolls to a sheet of rather thick gage—for example, a sheet of about 18-gage. By such method of rolling, which can be accomplished, if desired, in a continuous mill, instead of the sets of groove-rolls and plating-rolls shown in the drawings, I am enabled to obtain at a single heat a sheet of much thinner gage than can ordinarily be obtained in the cross-rolling process heretofore practiced

in reducing the bars to plates or sheets preparative to forming the pack in the ordinary method of making sheet metal. The sheet obtained will be from thirty to forty feet or more in length, and while it is still hot this sheet is folded so as to form a pack having several thicknesses of sheet therein, as shown in Fig. 3, this being accomplished either by hand or, as preferred by me, with suitable folding apparatus, which it is not necessary to here describe.

The folding of the sheet shown in Fig. 4 into the package shown in Fig. 5 produces a package of the proper width for the sheet and of such length that it can be properly reheated within a suitable furnace. The sheet may, however, be cut by suitable shears into sheets of the proper length and formed into a pack, instead of folding, as above described. The package is then introduced into the furnace, and when brought to the proper heat is withdrawn and fed to a set of plating-rolls either two or three high, as desired, such rolls being illustrated in Fig. 2, and in said rolls is drawn out to the proper length and desired gage or thickness of sheet. For many gages this can be accomplished at the single heating of the package, as by my process I obtain the first sheet of thinner gage than obtained in the ordinary rolling of the plates for forming a pack, and I am therefore enabled to produce the sheet metal from the slab with but one reheating, though for forming thin gages a second reheating of the package may in some cases be required. After the package has been rolled out to form the several gages in the several sheets or folds thereof it is trimmed along the ends, as shown in the dotted lines, Fig. 6, so producing the finished sheet metal. By this method of manufacture I am not only enabled to reduce the cost of manufacture largely by overcoming the necessity of rolling out separate bars to form sheets for piling into a pack, but by saving in the reheating I produce a large saving in the cost, and as I am enabled to roll the sheet for folding or cutting to lengths much more rapidly than in the ordinary method of manufacture the output of the same plant is largely increased and the cost of the finished sheets correspondingly reduced.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The herein-described method of forming sheet metal, consisting in rolling a slab, bloom, or pile to a suitable sheet of thick gage and of sufficient length to produce several finished sheets, forming a package of several sheets obtained from such long sheet, reheating the package, and reducing the sheets therein to the proper gage, substantially as and for the purposes set forth.

2. The method of forming sheet metal herein described, consisting in rolling a slab, bloom, or pile to a sheet of proper thickness and of sufficient length to produce several finished sheets, then folding the sheet so obtained into a package containing several folds, then reheating the package and rolling it to produce the proper thickness in the sheets or folds thereof, substantially as and for the purposes set forth.

3. As a step in the manufacture of sheet metal, rolling a slab at one heat into a sheet of sufficient length to produce several sheets suitable for rolling together to the finished gage of sheet metal desired, substantially as and for the purposes set forth.

In testimony whereof I, the said JOSEPH R. JACKSON, have hereunto set my hand.

JOSEPH R. JACKSON.

Witnesses:

JAMES I. KAY,

ROBT. D. TOTTEN.