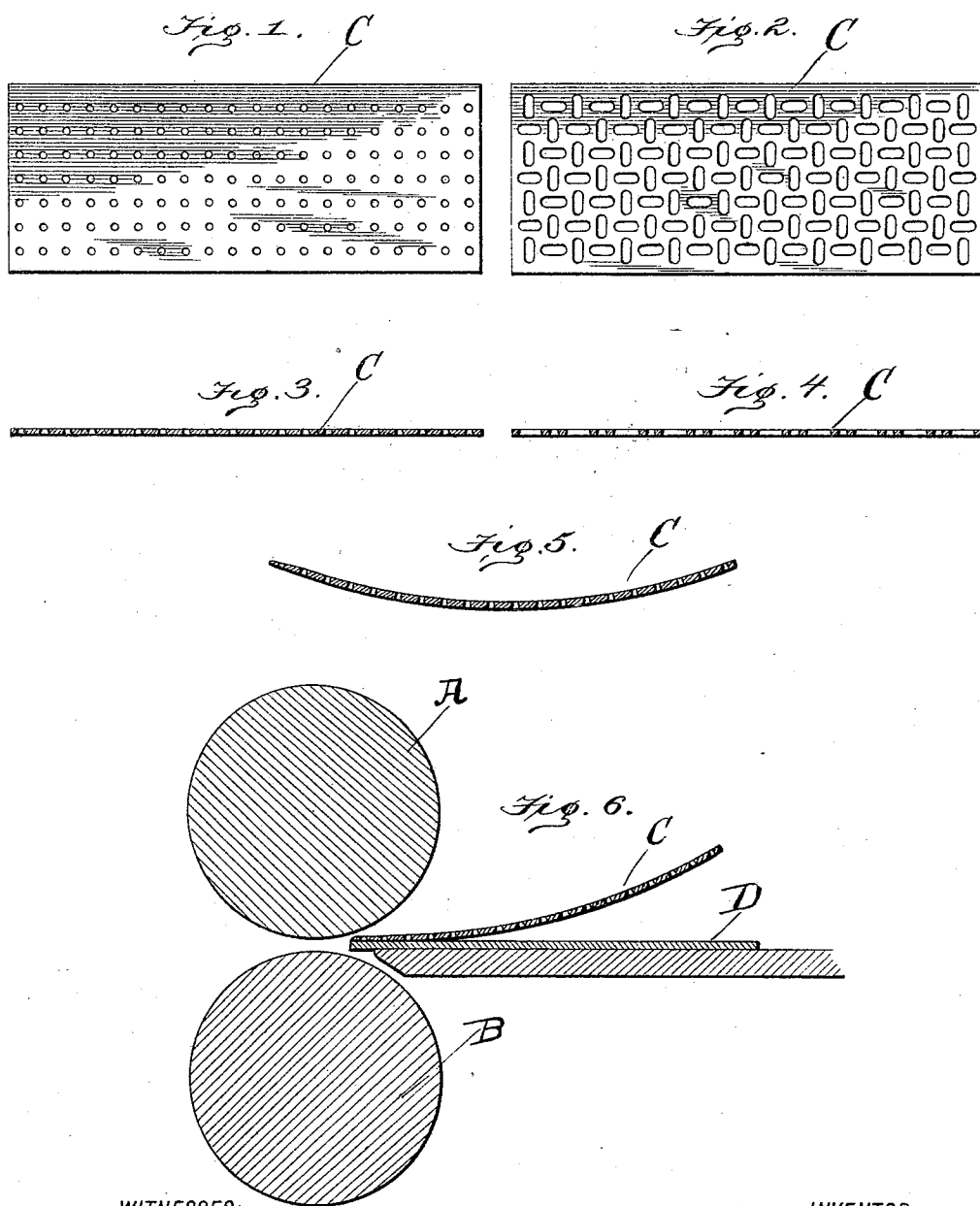


(No Model.)

H. H. BATES.
MEANS AND APPLIANCE FOR PRODUCING KNOBBED OR RIDGED
WROUGHT METAL PLATES.

No. 543,607.

Patented July 30, 1895.



WITNESSES:

Edwin L. Bradford
F. R. Cornwall

INVENTOR

Henry H. Bates

UNITED STATES PATENT OFFICE.

HENRY H. BATES, OF WASHINGTON, DISTRICT OF COLUMBIA.

MEANS AND APPLIANCES FOR PRODUCING KNOBBED OR RIDGED WROUGHT-METAL PLATES.

SPECIFICATION forming part of Letters Patent No. 543,607, dated July 30, 1895.

Application filed May 18, 1895. Serial No. 549,781. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. BATES, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Means and Appliances for Producing Knobbed or Ridged Wrought-Metal Plates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Reference is made to the accompanying drawings, forming a part of this specification, in which—

Figures 1 and 2 are plan views illustrating a perforated templet which I employ. Figs. 3 and 4 illustrate the same in section. Fig. 5 illustrates a curved templet in section, and Fig. 6 illustrates the templet in actual use in combination with a compression device consisting of a pair of plain rolls, indicated in diagram, as the templet and hot plate are about to enter the bite of the rolls.

Upon the said drawings, A and B represent the rolls.

C represents the templet.

D represents the hot metal plate about to be subjected to compressive treatment, and E represents the table of the compression device.

My invention relates to improvements in the art of metal working, and consists in improved means and appliances for producing knobbed, ridged, or studded wrought-metal plates suitable for stair-covers, vault-covers, &c. Such plates have heretofore been produced by casting, or, in case of stair-covers, of thin sheet metal embossed or perforated. The cast-metal plates are heavy, expensive, and liable to break when heavy boxes or trunks are let fall on them. The embossed plates of thin sheet metal soon wear through on the prominences and then become a source of danger. By my invention I am enabled to produce such plates cheaply, of wrought or rolled metal, knobbed or studded in various patterns on one side and plain on the other, without the use of special rolls or dies for the purpose. The plates can be manufactured in any mill where plain rolls or drop presses or other compression means of the requisite size and power are found. To this end I em-

ploy in conjunction with such plain rolls or other compressing device a templet or pattern plate consisting of some sufficiently hard material, such as a piece of wrought-steel plate or rolled metal of suitable thickness pierced with apertures in such varied patterns as may be desired, either by means of a common punching machine or by drilling, or in any of the ways commonly known to the art. These apertures may be of any desired form or figure, circular or otherwise, but when made by punching, if circular, they should preferably be reamed out to remove the burr, and in any case should be given a slight conical or tapering shape to promote clearance in the use which I am about to describe. If the apertures are of some other form than circular the burr should be removed by hand-filing or other known mechanical means, attention being given to the aforesaid tapering shape.

When the templet is employed in conjunction with plain or smooth rolls in a rolling mill, it may preferably be given a curvature to facilitate handling and clearance. In such cases the radius of curvature must be somewhat greater than that of the upper roll and may be much greater. The concavity is toward the upper roll in practical use, and the widest part of the apertures is toward the convex side. The advance edge of the templet is somewhat thinned when used with rolls to facilitate entry into the bite of the rolls. When other means of compression than rolls are employed a flat templet is essential, the widest part of the apertures being lowermost in use, as before. The templet I preferably employ is of rolled steel plate, and of thickness suitable to the intended character of the product, but it may be of other materials, as certain alloys, or of non-metallic fire-resisting material, as indurated and prepared asbestos board.

The mode of operation is as follows: The heated metal plates to be treated are delivered from the heating-furnace in succession or continuously upon the flat table which forms an adjunct of the compression device in any form. An attendant having a pile of templates beside him then places a templet accurately upon the hot-metal surface fresh from the furnace with the clearance side down, and both are then together subjected to pow-

erful compressing means, which is rapidly applied and then withdrawn before the templet has time to get unduly heated. Other hot plates and templets follow in succession, the
5 templets being separated and removed by an attendant as they emerge from the rolls or press and thrown aside to cool. To facilitate the separation in case any difficulty should be found, the templet may be previously
10 ously rubbed over with chalk, tale powder, or carbon powder, or treated in any other of the well-known ways employed for such purpose. When rolls are employed as the compression agency, the heated plate is brought well up
15 to the bite of the rolls and the attendant then places the templet with its advance edge in conjunction with the forward edge of the metal plate to be impressed, so that they may enter the bite of the rolls together. Both are
20 then run through the rolls in contact, when upon emergence the pattern formed by the perforations will be found impressed in relief upon the surface of the hot-metal plate. The metal plate to be impressed should be
25 submitted to the rolls at as low a rolling temperature as possible, determined by the character of the desired impression and the amount of relief contemplated. These templets can be so cheaply made in a great variety of patterns that though they soon wear out they are
30 much less expensive than the construction of special rolls or dies would be. Besides, the ordinary use of the rolls is not obstructed nor space in the mill occupied for this special manufacture except when actually carried on, and a special batch of templets can be made at short notice, whence great economy of production results. Great superiority of product
35 also results from this mode of manufacture, as the plates can be made of any degree of thinness or lightness required, with a durable and solid wrought iron or steel wearing-surface or steel-faced surface and soft back.

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

1. In the manufacture of studded, knobbed or ridged wrought metal plates, the apparatus herein described, consisting of a perforated plate or templet in combination with means
50 or mechanism for powerfully compressing the said templet in close contact with a hot metal plate to be impressed, whereby the figure or pattern of the perforation is left in relief upon the surface of the impressed plate, substantially as specified.

2. In combination with a power compression device for the working of heated metals, a templet formed of a plate of hard, heat-resisting material perforated in any desired pattern for application to the surface of a hot
60 metal plate to be impressed, whereby when the two are subjected together to the compressive means the pattern of the perforated templet is left impressed in raised bosses or ridges upon the surface of the said plate, substantially as specified.

3. An apparatus for impressing raised bosses, knobs or ridges upon the surface of wrought metal plates, consisting of a compression means, such as a pair of plain power
70 driven rolls, in combination with a templet formed of a plate or sheet of hard heat-resisting material perforated with apertures arranged in suitable designs, whereby when hot metal plates are subjected to compression in conjunction with the said templets in the said
75 apparatus, the surface thereof is left bearing the impression of the pattern formed in the substance of the said templet, substantially as specified.

4. The combination of a power compression device and a templet or plate of hard heat-resisting material provided with tapered apertures of any desired figure arranged in any desired pattern, whereby a wrought metal plate
85 when subjected in a heated condition to the action of said compressing device in close contact with the templet aforesaid is made to receive the pattern of the said perforations in relief upon its surface, thus forming a knobbed, studded or ridged exterior upon one side of the said plate, substantially as specified.

5. In combination, a pair of smooth power driven rolls, and a curved templet or plate provided with apertures of any figure arranged
95 in any desired pattern, whereby a wrought metal plate when subjected in a heated condition to the operation of the said combination of apparatus substantially in the manner described, will have imparted to it a knobbed or
100 ridged surface corresponding to the design of the templet, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY H. BATES.

Witnesses:

WM. P. CHURCHILL,
RHESA G. DU BOIS.