

(No Model.)

W. H. MALLORY.

PROCESS OF EMBOSSING AND SHAPING METALS.

No. 249,193.

Patented Nov. 8, 1881.

Figure 1.

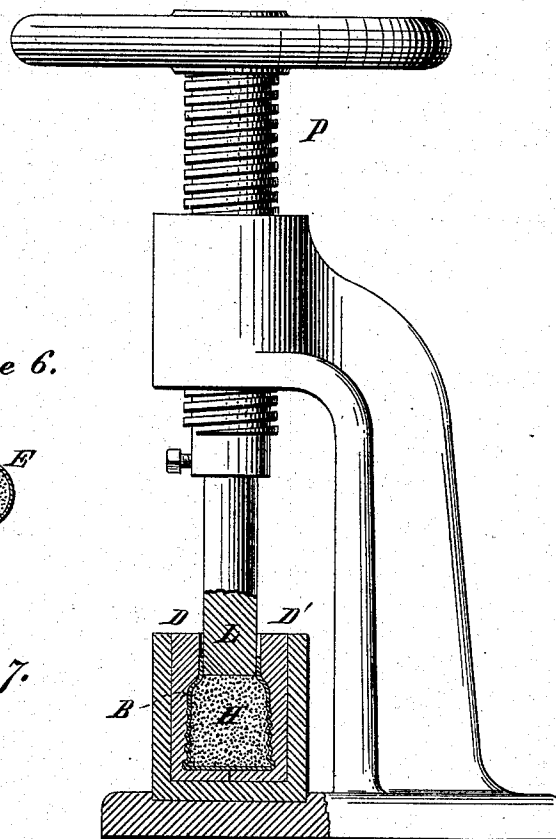


Figure 2.



Figure 3.



Figure 4.

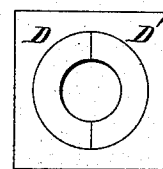


Figure 6.

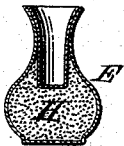
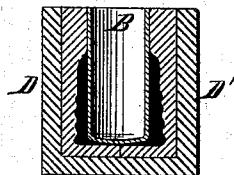


Figure 7.



Figure 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM H. MALLORY, OF BRIDGEPORT, CONN., ASSIGNOR OF THREE-FOURTHS TO THOMAS F. ROWLAND AND GEORGE S. MALLORY, BOTH OF NEW YORK, N. Y., AND MARSHALL H. MALLORY, OF BRIDGEPORT, CONN.

PROCESS OF EMBOSSING AND SHAPING METALS.

SPECIFICATION forming part of Letters Patent No. 249,193, dated November 8, 1881.

Application filed May 2, 1881. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM H. MALLORY, of the city of Bridgeport, State of Connecticut, have invented a new and useful Process for
5 Embossing and Shaping Metals, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

My invention relates, first, to a new and useful process, applicable by slight variations to shaping and embossing metals and metallic
10 bodies in many different ways; and, secondly, to the products of such process.

The process may be used in connection with
15 many bodies which are capable of being shaped or formed by dies; and it consists in a novel method of operation in applying pressure to or within the body to be shaped or embossed by which such body is made to conform in configuration to a die.

I shall describe my process as applied to a copper body, but it will be understood that it is equally applicable to bodies of other materials.

25 In carrying out my process I require a die or shaper against which the metal is to be forced, a press to force the metal against the die, and a suitably dry powder for conveying the force of the press to the metal and causing
30 it to assume the desired configuration. This powder is fed in successive charges into the blank, and after each charge the plunger is brought to bear upon the powder, which is thereby forced laterally, spreading the blank outward against the sides of the die with such
35 force that it will not only gradually take the form of the die, but will also exhibit in relief all the marks, figures, or embossing of the die. In the manufacture of articles of irregular shape
40 or of any considerable height this successive and alternate charging and pressing is of the utmost importance, because I have found that in operating with a granular material the direct downward pressure will only act to spread the
45 metal laterally through a limited mass, so that when the vessel is of such size as to contain more than such mass the pressure will not effect the desired result.

I shall particularly describe the method of making a vase from which my process will be
50 readily understood in its application to other articles.

In my drawings similar letters refer to similar parts.

P represents a suitable press. In carrying
55 out my invention upon a large scale a hydraulic press should be employed.

D D' represent a female die.

B represents a copper blank. In this case a cylinder of copper is shown closed at the
60 lower end. In Figure 2 the blank is shown, and in Fig. 3 an inside view of the die, and in Fig. 4 a horizontal section of the same. In Fig. 5 the blank is shown in full in the die, which may be made of two or more portions,
65 as shown. In Fig. 1 the die and blank are shown in position under the press, and the blank is shown as filled with a powder. Many forms of powder can be used, but I have found a siliceous powder to be most efficacious. This
70 powder should preferably be dry, but it may be operated with a certain amount of moisture, but not sufficient to make the mass plastic. By forcing the plunger L of the press downward the blank has been driven out to conform
75 to the shape of the die, as is clearly shown in Fig. 1. The powder H, which has been used to force out the blank, may then be removed or it may be left in position, in which case it forms a very suitable and solid filler for the
80 article, and by retaining this filler I am enabled to make satisfactory articles with much less thickness of metal than has heretofore been possible.

In Fig. 6 I show a vase made by my process
85 in which the filler H has been left in position, and a suitable hole having been drilled within the filler an inner cup, F, has been inserted and brazed to the outer vase, E. This inner cup may also be forced out and into position
90 by the same process, if desired.

In Fig. 7 is shown a door-knob made by my process with the filler H within it. It will be obvious that this process is susceptible of almost an infinite variety of applications.

Many metallic articles which have hereto-

fore been necessarily made in several pieces, can be readily made of a continuous sheet by my improvement.

5 Of course the surface on which the sand acts will not be a finished surface.

My process might also be used in shaping steel or other material only flexible when heated, by placing the blank within or against the die, heating the same, and applying pressure. 10 By successively heating the metal and applying pressure and using fire-clay between the press and the blank very good results can be obtained. The heat should be applied to the inside of the blank.

15 My invention must be distinguished from the forming of metal articles by a plunger brought upon the entire mass within the blank at one operation. This is effective when the said mass is such in quantity as can all be moved, and may be used for the manufacture 20 of certain small articles; but I have discovered that large articles or those of irregular form cannot be made in this way. For instance, an article of the shape and size shown in Fig. 3 25 can only be made by the introduction of successive charges and corresponding alternating application of pressures, whereby the blank is gradually distended from the bottom upward and made to conform to all the irregularities 30 of the die.

My invention must also be distinguished from those processes in which liquid or plastic materials are subjected to pressure in the blanks, and which necessitate the use of pack- 35 ings to prevent the material from escaping between the die and blank, and have therefore proved to be practically of but little use.

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

1. The within-described process of shaping, 40 forming, or embossing metal articles, the same consisting in the intervention between a plunger and the metal to be formed of a dry powder, applied in successive charges and pressed after each charge, substantially as set forth. 45

2. The process of shaping or forming non-ductile metals, the same consisting in introducing the blank hot in the die, applying a charge of refractory dry powder, bringing pressure upon said charge until the blank is partly dis- 50 tended, again heating, charging, and pressing, and repeating such operations until the shaping is completed, substantially as set forth.

WM. H. MALLORY.

Witnesses:

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