

No. 741,852.

PATENTED OCT. 20, 1903.

G. THOMSON.
STAMP MILL.

APPLICATION FILED SEPT. 29, 1902.

NO MODEL.

FIG. 1.

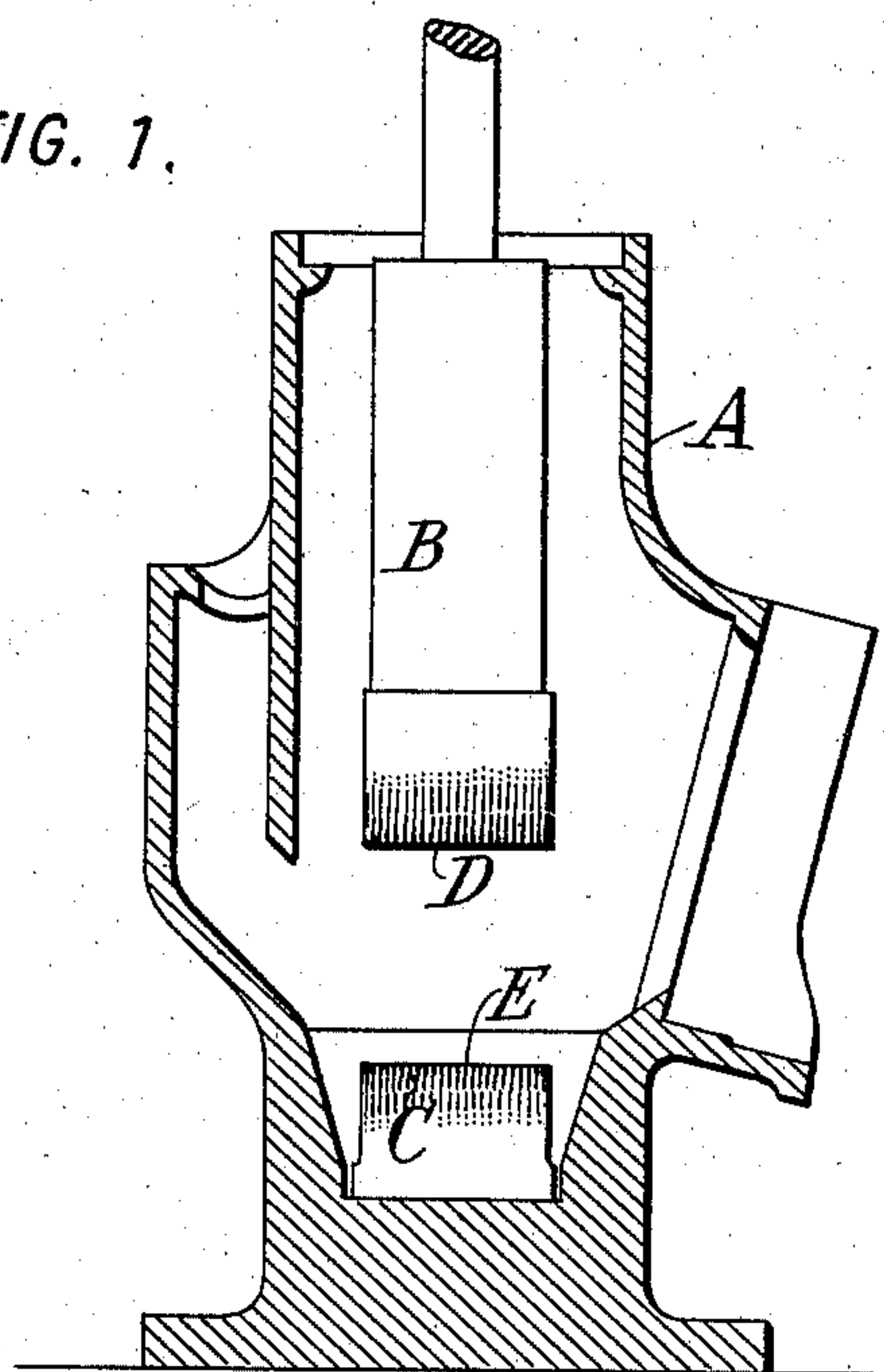


FIG. 2.

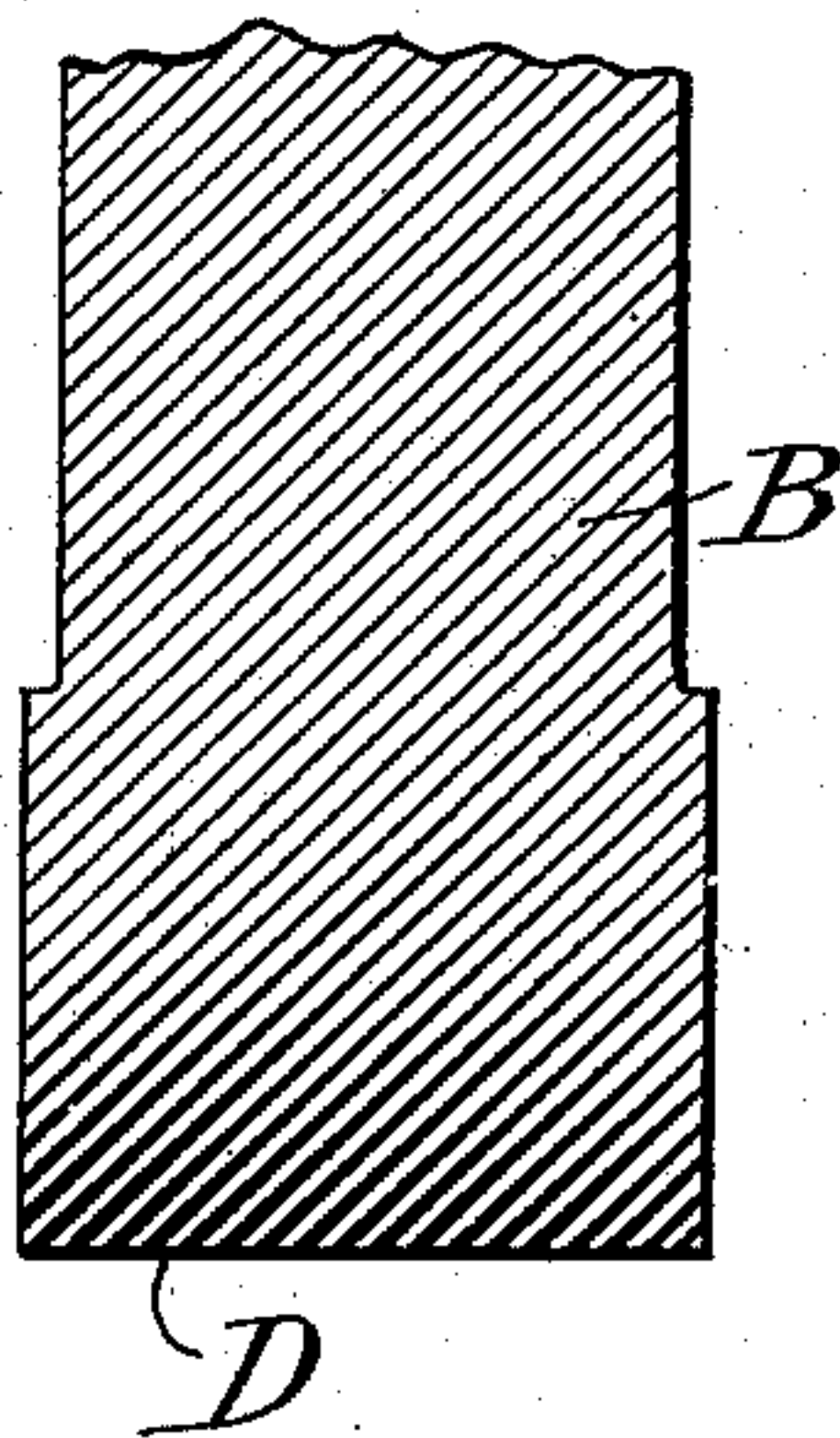
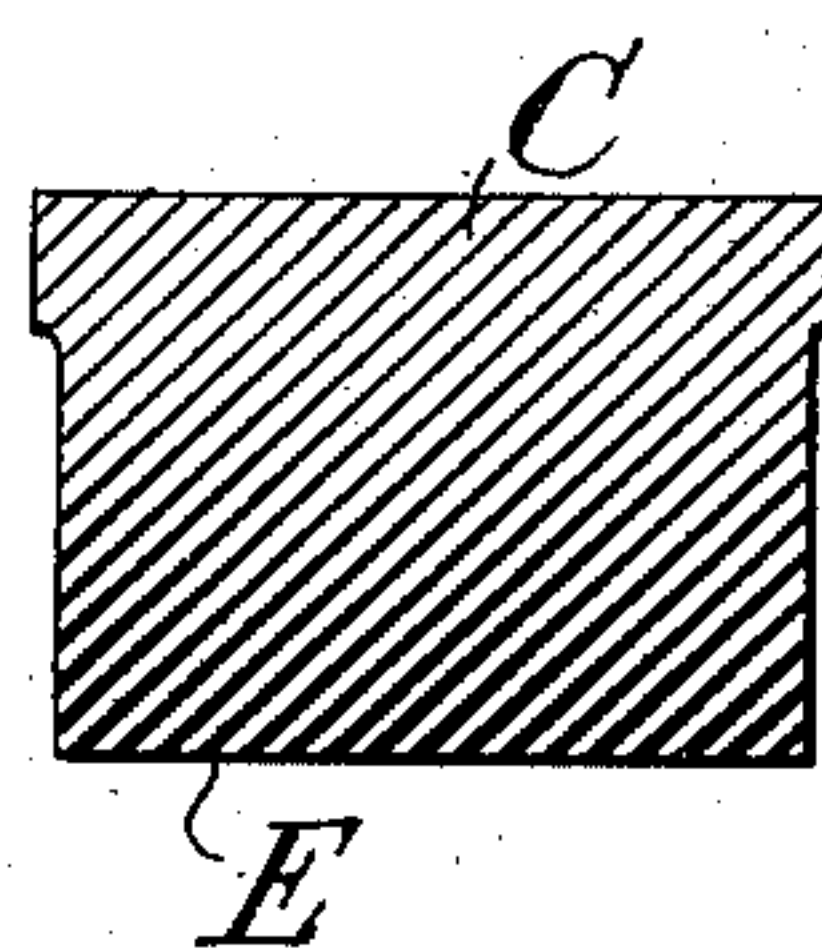


FIG. 3.



WITNESSES:

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STAMP-MILL.

SPECIFICATION forming part of Letters Patent No. 741,852, dated October 20, 1903.

Application filed September 29, 1902. Serial No. 125,156. (No model.)

To all whom it may concern:

Be it known that I, GEORGE THOMSON, a citizen of the United States, residing in the city of Elizabeth, county of Union, State of New Jersey, have invented certain new and useful Improvements in Stamp-Mills, of which the following is a specification.

My invention aims to provide certain improvements in stamps, dies, or the like such as are commonly used in stamp-mills for pulverizing rock, ore, &c., whereby the stamp, die, or the like has certain advantages over the steel now used for making these parts and whereby the mixing of the concentrates with pulverized iron or steel worn from the stamps is considerably reduced.

My invention has also various other advantages, as specified in detail hereinafter.

Referring to the accompanying drawings, illustrating a stamp-mill embodying my invention, Figure 1 is a section of the same showing the stamp and die in elevation. Figs. 2 and 3 are sections which illustrate the process of forming the stamp and die respectively.

Great difficulty is experienced in obtaining a satisfactory material for the stamps and dies of various machines, but especially of stamp-mills for stamping ores. If the harder grades of steel are used, it is found to be brittle and the edges break off. If made of softer steel, so as to avoid brittleness, the face of the stamp wears away very quickly, which is the case with the ordinary stamps now in use. Besides the short life of such stamps there is a serious objection to their use in that the wear is very rapid and the pulverized iron or steel which is worn off the face of the stamp becomes mixed with the concentrates, and thereby adds to the cost of refining the metal. This is especially noticeable in refining copper.

According to my invention I make stamps, dies, and the like, or at least the faces thereof, of an alloy containing nickel, steel, and copper, which alloy I have found to be not brittle and yet of extreme hardness. In fact, I have found such an alloy to be so hard that it resists the action of all metallic cutting-tools. Of course the entire body of the stamp might be made of this alloy, but preferably only the face of the stamp is so made. The

process which I prefer to use in making my improved stamps forms the stamp at once, with a face of the alloy and with a body of steel united to said face by a cast union—that is to say, cast integral therewith.

While the composition may be varied somewhat, I prefer to make the alloy of about seventy or seventy-five per cent. steel and the remainder nickel and copper. This alloy is of a greater specific gravity than steel, and this fact affords a very convenient process of making the stamps with a face of alloy and an integral body of steel.

Any suitable process of forming the stamp may be used. A simple process is as follows: A mold is prepared of the shape of the stamp or die to be molded, and the alloy, preferably in the proportions above stated, is run into the bottom of the mold. Before it has time to set in the mold steel, preferably free from copper or other elements, is run onto the top of the alloy and being of a lower specific gravity remains on top, but is united to the bottom portion by a cast union, so as to be substantially integral therewith. The bottom of the mold forms the face of the stamp.

Referring to the stamp-mill illustrated, A indicates the casing of the mill, B the stamp, and C the die, between which and the stamp the ore is crushed. The stamp B is shown in Fig. 2 with its lower or working face D in the position in which it is cast—that is to say, at the lower portion of the stamp. The working face E of the die C is its upper face in use; but in molding it according to the process described it is formed with its face E at the lower portion, as shown in Fig. 3.

The fact that I am enabled to form the face and the body of the stamp in one casting operation makes the manufacture of my improved stamp comparatively cheap and avoids any necessity for subsequent treatment of the face to harden it. The face and body are integral, so that they are as firmly united as in the usual solid-steel stamps. The wear is reduced to the minimum, and breaking or chipping of the edges is avoided. The comparative saving in the cost of subsequently refining the ore is also considerable as compared with the old-style steel stamps. The composition described has, therefore, besides the qualities which make it valuable in other arts,

features of usefulness which adapt it peculiarly to stamp-mills for ores and the like.

Though I have described with great particularity of detail a specific embodiment of my invention, yet it is to be understood that
5 the invention is not limited to the exact embodiment described.

Various modifications in the proportions and processes described and various additions to the composition described may be
10 made by those skilled in the art without departure from the invention.

What I claim, therefore, is—

A stamp, die, or the like, having a face composed of an alloy of copper, nickel and steel, 15 substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

GEORGE THOMSON.

Witnesses:

FRED M. HALSEY,

BELLA BROWN THOMSON.