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PATTERN-PLATE.

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To all whom it may concern:

Be it known that I, JOHN BAYER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Pattern-Plates, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

My invention relates to pattern plates for use in making molds for the casting of metal, by the use of which pattern plates sand molds may be easily and quickly obtained without the necessity of splitting the flask and withdrawing the pattern, which latter operation is frequently attended with accidents which destroy the sand mold and require its being made over again. By the pattern plates which I here show, the cope and drag of a mold may be quickly made by ramming sand into contact with the pattern plate when held in a suitable flask.

Furthermore, the invention defines a pattern plate or plates made of a composition of such characteristics that the substance does not shrink on cooling, when the pattern plate is first made from the original pattern.

The invention further comprises the elements and combinations thereof set forth in the accompanying claims.

Reference should be had to the drawing, in which—

Figure 1 is a plan view of a pattern plate used to form the drag of a mold; Fig. 2 is a plan view of the same used to form the cope of a mold; Figs. 3, 4 and 5 are sectional elevations through the flask and represent steps in the formation of the pattern plates; Figs. 6 and 7 are sectional elevations through the mold and represent steps in the formation of the sand mold from the pattern plates; and Fig. 8 represents a completed sand mold.

In carrying out my invention, I have shown and will describe the making of a sand mold by use of two pattern plates constructed in accordance with my invention, but it will be obvious that a single pattern plate may be used, when desired, and the use of a single pattern plate will be considered within the scope of this invention.

In the drawing I have shown my pattern plates constructed to form a plurality of castings in a single flask, although it will be obvious that a single casting may be formed

within the flask, where such may be desired. Furthermore, I have shown my pattern plates for use in the formation of a casting which is substantially uniform in thickness, so that the portions of the finished castings which are raised will be complemented by a corresponding hollow portion upon the underside of the casting, but it will be apparent that castings of unequal thickness may be made with equal facility.

In carrying out the invention, I use the ordinary two-part flask represented in Fig. 3 and place within this flask a pattern represented at 2, with which is joined or assembled a sprue former 3 and runners 4 and 5 like that shown in the view of pattern plate *a* in Fig. 1. Sand is employed to fill the flasks. This flask is filled with sand according to the well known manner of making a sand mold, and provides the cope 1 and drag 1^a. The cope and drag of the mold are then separated, the cope being inverted upon a new follow board 1^b, and a new top frame 6 is placed thereon, as shown in Fig. 4, into which is poured the composition from which I form the pattern plate. This composition will then fill the cavities which have previously been formed in the sand, and when hardened the frame 6 and its contents will be removed and will form one of my complete pattern plates marked *a*. The drag 1^a of the mold is also placed upright upon a suitable follow board 1^c and provided with a new frame 7, (see Fig. 5) into which is put the composition of which I form my pattern plate, and the same is allowed to cool and come into contact with the depressions and elevations of the sand in the cope. When the composition is hard, the top frame is removed and in this manner I secure the second pattern plate *b*, as represented in Fig. 2.

The material of which the pattern plate, or plates, as the case may be, is formed, consists of hard Trinidad asphalt, and in some instances I add to the asphalt a certain quantity of plumbago. Some grades of Trinidad asphalt, when heated and cooled, produce a surface which is smooth and sufficiently so to give a good parting between the sand and the pattern plate. Other grades of Trinidad asphalt do not give such a good parting, and with such I find it necessary to use plumbago. When the mixture is used, I combine the asphalt and plumbago in the proportion of forty of

asphalt and one of plumbago, by weight, and by the use of the plumbago invariably secure a surface upon the pattern plate which gives a good parting between the sand and pattern plate.

The asphalt alone, or the mixture, is heated to its melting point and is poured into the top frame upon the sand having the impression of the original pattern, as previously explained. The top frame may be completely filled with asphalt, or preferably I pour sufficient asphalt, or the mixture, into the frame to secure a thickness of about two or three inches and allow the same to cool. The asphalt seems to have the quality of flowing into all the crevices and lines which are made in the sand by the original pattern, and thus give a faithful reproduction. The purpose of using a thin layer of the composition is that the same may be rapidly cooled and thus prevent waste of time in forming the pattern plates. The frame above the asphalt is then filled in with some supporting material, such as plaster of Paris, and sets quickly. The asphalt, or the mixture of the asphalt with the plumbago, when solidified, produces a hard surface, and one which may be repeatedly used in the formation of sand molds.

The composition here disclosed is non-shrinkable, so that the original pattern which is shown in Fig. 3 may be made of exact dimensions with the article it is desired to finally produce as a casting, without the necessity of allowing for any shrinkage. Furthermore, the material is of such composition that it readily takes all of the irregularities of the pattern and gives clear, sharp edges, so that all the lines which the sand will retain from the pattern will be reproduced in the composition of which the pattern plate is made.

In forming the single molds by the use of the pattern plates, the pattern plate *b* shown in Fig. 2 is surmounted by a frame, and sand is poured within the flask top, as represented in Fig. 6. The sand will be compacted in any well known manner, and then the sand mold removed from contact with the pattern plate *b*, thereby producing the drag of a sand mold, which is the exact duplicate of the original drag 1^a. The pattern plate *a*, as shown in Fig. 7, will likewise be sur-

mounted by a frame which will be filled with sand and compacted, after which the frame may be removed from the pattern plate, whereby there will be formed the cope of a sand mold, which is the exact duplicate of original cope 1. The cope 10 and drag 9, the formation of which have just been described, will then be assembled, as shown in Fig. 8, whereupon the metal may be poured through the sprue 8 in a manner well known in the art.

By the use of the pattern plates I have here described, a sand mold may be quickly made. Furthermore, the sand mold may be made without danger of spoiling the mold, which is always incident when a mold is made directly from the pattern, because considerable experience and deftness are required to successfully draw the pattern from the mold. Furthermore, the original master pattern may be preserved and not subjected to the frequent use and consequent wear which would be the case if it were the only pattern used.

Having thus described my invention, what I claim is:

1. A pattern plate formed principally of asphalt, with an admixture of plumbago.

2. A pattern plate formed of asphalt and plumbago in substantially the proportions described.

3. A pattern plate formed of hard asphalt and plumbago in the proportions of about forty to one, by weight.

4. A pattern plate having a hard facing formed principally of asphalt and a backing for said facing, and a frame surrounding the facing and backing.

5. A pattern plate having a facing formed principally of cast asphalt and a backing of plaster of Paris, with a frame surrounding the facing and backing.

6. A pattern plate having a hard facing formed principally of asphalt and a backing for said facing.

7. A pattern plate containing asphalt and plumbago.

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

JOHN BAYER.

Witnesses:

A. J. HUDSON,
BRENNAN B. WEST.