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C. MORGAN.

METHOD OF MAKING SAND MOLDS.

APPLICATION FILED JULY 17, 1905.

Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES MORGAN, OF FREEPORT, ILLINOIS, ASSIGNOR TO ARCADE MANUFACTURING COMPANY, OF FREEPORT, ILLINOIS, A CORPORATION OF ILLINOIS.

METHOD OF MAKING SAND MOLDS.

No. 887,415. Specification of Letters Patent. Patented May 12, 1908.

Application filed July 17, 1905. Serial No. 269,909.

To all whom it may concern:

Be it known that I, CHARLES MORGAN, a citizen of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Methods of Making Sand Molds, of which the following is a specification.

My invention relates to an improved method of molding.

The apparatus with which I prefer to practice my method is illustrated in a general way in the drawing hereto attached which is a front view of said apparatus showing certain portions in section and the said apparatus is described in detail and specifically claimed as such in an application for Letters Patent filed on even date herewith and allotted Serial Number 269,910.

Referring to the drawing, A, represents diagrammatically, a molding machine, the form here illustrated being that shown, described and claimed in patent of July 4th, 1905, Number 793,860 to Henry Tscherning. This machine has at its upper end a head which supports a pattern, A^1. This pattern here is shown as a match plate, but obviously any other form of pattern can be used. The pattern lies at the bottom of a flask-section, A^2, as illustrated.

Directly above the molding machine, A, is a hopper, B, for holding sand. This hopper is supplied by means of a conveyer, B^1, which drops the sand on to a movable sieve, B^2, which sifts the same and removes any scrap iron before it enters the hopper. At the lower end of the hopper is a grate, C, composed of rocking grate bars, *c*, which can be rocked rapidly and continuously by any mechanical means under control of a handle, C^1. When this handle is moved in the proper direction the grate bars are rocked and the sand is dropped vertically from the hopper, falling first through a coarse screen, D, and then with a straight vertical drop into the flask and upon the pattern.

It has heretofore been customary to sift a small quantity of sand into a flask by hand, the sand in such cases falling from a distance of perhaps a foot on to the pattern. When the sand falls in a finely divided condition from such a height, it comes to rest in a loose condition, and if the pattern having any considerable vertical irregularity is in use, it is necessary to tuck this loose sifted sand into the lower portions of the pattern by hand. Thereupon it is customary to shovel in sand on top of this sifted sand to the level of the flask and squeeze the same with a molding machine. In shoveling in sand, unless great care is used, the body of sand falling from the shovel will strike the comparatively thin layer of sifted sand in a diagonal direction and break it or push it away from the pattern, thus producing a poor mold and a poor casting.

I have discovered that if the sand is dropped vertically in a finely divided condition from a height varying from two or three feet to eight or ten feet above the pattern and falls vertically thereon, it will embed itself perfectly about the same, so that no tucking by hand into the lower portions thereof is necessary, for each grain of sand as it falls acts to tamp the grains which precede it. The result of such an operation is that the flask can be filled to the top with uniformly packed sand which fills every line of the pattern without any manual manipulation whatever and without any side movement of the sand as from a shovel, which is likely to break the surface of the mold and form a poor casting.

My method does more than merely fill the flasks with sand by mechanical means; it actually fills the flask and partly tamps the sand at the same time. It is not practicable to fill a flask entirely full with a sieve from a low height and then squeeze it, for the sand will be loose and when squeezed a hard compact mass of sand will be formed at the top which will prevent the transmission of force to the loose sand in the depressions in the castings. With my method, there is no loose sand anywhere in the flask and the sand is almost hard enough to pour into without any pressure of the molding machine whatever. The greater compactness of the molds produced by my method is evidenced by the fact that a much larger quantity of sand is required to fill a given number of molds with my method than is required to fill the same molds with the ordinary hand method now in use with molding machines.

It will be evident from the above description that this method can be practiced in a

number of different ways and that the particular apparatus used is of little consequence, although I prefer the one here shown.

I claim as new and desire to secure by Letters Patent:—

1. The herein described method of forming molds which consists in dropping the sand in an even, free, unobstructed stream into the flask in a substantially vertical direction from a height sufficient to embed it solidly about the pattern and subsequently squeezing the mold.

2. The herein described method of forming molds which consists in dropping the sand in a divided condition and in an even, free, unobstructed stream into the flask in a substantially vertical direction and from a height sufficient to embed it solidly about the pattern, and subsequently squeezing the mold.

In witness whereof I have signed the above application for Letters Patent at Freeport, in the county of Stephenson, and State of Illinois, this 12th day of July, A. D. 1905.

CHARLES MORGAN.

Witnesses:
FRED E. BOEDEKER,
CHARLES MILLER.