E. H. MUMFORD.

METHOD OF MAKING CASTINGS.

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Fig. 2.

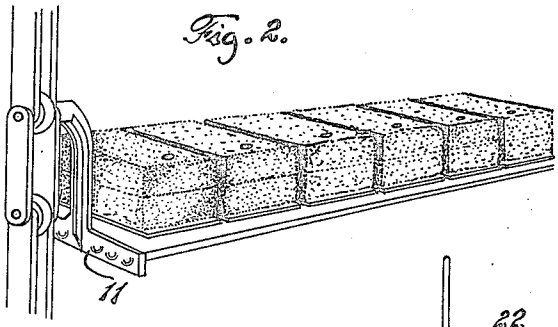


Fig. 1.

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METHOD OF MAKING CASTINGS.

1,123,914. Specification of Letters Patent. Patented Jan. 5, 1915.

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To all whom it may concern:

Be it known that I, EDGAR H. MUMFORD, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Methods of Making Castings, of which the following is a specification.

This invention relates to a method of making castings and it has for one of its primary objects the provision of an improved method whereby the molds are handled in a simple, expeditious, and economical manner and whereby the space required in carrying out the various steps is reduced to a minimum.

My invention further contemplates the provision of a novel method wherein the making of the molds, the pouring, and the handling of the poured molds are so correlated that the three operations can be carried out with great rapidity and continuity while at the same time provision is made for accommodating and temporarily storing a large number of poured molds in such manner as to utilize but little more space than would be required for a single mold of an approximately corresponding size.

The foregoing together with such other objects as may hereinafter appear, or are incident to my invention, I attain, by means of a method, the steps of which I have illustrated in the accompanying drawings wherein—

Fig. 1 is a section through a foundry having molding apparatus, conveyer and storage mechanism, and pouring apparatus arranged to carry out my improved method; and Fig. 2 is a perspective view of a detail of the storage mechanism.

In order to afford a clear understanding of my improved method and of the advantages incident thereto, I shall first describe the general form of apparatus I employ in carrying out my invention.

Referring now to Fig. 1, it will be seen that the foundry floor 7 supports a vertical frame or supporting structure 8, on which is mounted an endless substantially vertical conveyer A. The conveyer comprises two endless belts 9, which are preferably of link belt construction and from which are supported a plurality of mold shelves 10, such shelves being pivotally hung from the conveyer by brackets 11, and being of a size sufficient to support a number of molds (see Fig. 2). The belts are carried on pairs of wheels 12 and 12′, the lower pair of which, 12′, is mounted closely adjacent to the foundry floor and over a pit 13. The belt moves in the direction indicated by the arrows. Only one of the belts 9 and one each of the wheels 12 and 12′ are shown in the drawings inasmuch as Fig. 1 is a sectional view of the whole apparatus and the said parts are arranged in the same planes.

Just above the bottom wheels, 12′, the belts engage guide members 14, only one of which is shown, which carry the belts inwardly in such manner as to successively uncover or expose the molds on the upwardly moving side of the wheels 12′. A pouring ladle 15 is supported adjacent to the wheels 12′ on the upwardly moving side of the conveyer mechanism. Mounted on the floor on opposite or downwardly moving side and closely adjacent to the conveyer mechanism is a molding machine 16 which may be of any preferred type.

I provide a sand floor 17 above the molding machine and the sand is supplied to the machine by means of the hopper 18. The sand, after having been used, is brought back to the sand floor by means of the foraminous chute 19 which extends from a point adjacent to the downwardly moving side of the conveyer to the sand floor. As the shelves pass the wheels 12 and move downwardly, they are tilted by a manually controlled trip mechanism or trip guide 20 and the molds are discharged from off the shelves into the chute. At a point in the chute substantially above the sand bin, the movement of the bottom boards 21, bands, castings, etc., is arrested by manually releasable stop means 22 and the sand is discharged therefrom, sifting through the chute into the sand bin and the casting being removed by hand from before the stop 22. It will be clear that the entire conveyer constitutes in effect a huge vertical mold supporting table capable of storing a great number of molds while at the same time but a minimum amount of space is required therefor.

Owing to inherent operating conditions it is practically necessary to carry on mold-

ing operations in a single storied foundry, and it is customary for the molder first to complete quite a number of sand molds, which are deposited on the foundry floor and occupy considerable space, and then to pour the molds. It will be obvious that this practice is not economical for it entails the use of extensive floor space and increases the number and extent of the movements necessary in handling and pouring the molds.

In carrying out my improved method, I propose to make the molds, on the molding machine 16 or otherwise, on the foundry floor adjacent to the storage conveyer mechanism and on the downwardly moving side thereof. The conveyer belts preferably have a continuous drive and as the molds are completed, they are stored on the shelves 10, this operation being continued until all the shelves of the vertical storage mechanism are filled, or until the molder has completed the desired number of molds. The molder then pours the molds from any preferred means such as the ladle 15 or from a hand ladle, the conveyer being now preferably driven step-by-step to bring successive shelves to accessible pouring position. After all the molds have been poured, or at any stage of the pouring operation, the trip guide 20 is shifted so as to automatically discharge the poured molds successively into the chute 19 in the manner hereinbefore set forth.

It will be apparent from the foregoing that the amount of floor space required is reduced to a minimum and that a large number of molds can be taken care of without interfering with the other operations. It will also be seen that the number and extent of the movements involved in the handling of the molds is reduced, and that the process is expeditious and tends to secure general economy. The use of the vertical mold storage mechanism has an added advantage in that it is not necessary to shift the molds on the shelves previous and subsequent to the pouring and they remain undisturbed while the metal cools. Moreover, in the operations of the apparatus as described, the sand is supplied, hopper fed, to the molds without the expensive sand conveyers commonly used.

If desired the molding and pouring operations can be carried on simultaneously, and it will be clear that this can be conveniently done in such manner that the workmen will not interfere with one another.

My improved method will be found to be of great value in the making of small castings for standard products, such for example as hardware, though it will be apparent that it is adapted for other kinds of work.

It will also be evident that, as contrasted with the horizontal mold table shops, in which the entire plant must run to operate a part of it, with this vertical system, single machines work with all the facilities afforded by the elaborate horizontal mold table and horizontal sand conveyer shops.

In connection with this fact, it should also be considered that, in the horizontal system, the round-the-shop complicated mechanism, like a chain, ceases to be of use, and lays out the entire foundry if an accident happens to any part of it, whereas in the vertical system, each molding floor is an independent unit, unaffected by the possible disabling of other units.

What I claim is:

1. The herein described process of providing for the handling and pouring of mold products which consists in forming the molds, in storing them on an endless substantially vertically movable storage conveyer, in transferring them by means of said conveyer to a pouring station on the upwardly moving side of said conveyer, in pouring the molds, and then in removing the poured molds from the conveyer.

2. The herein described process of providing for the handling and pouring of mold products which consists in forming the molds adjacent to the downwardly moving side of an endless substantially vertically movable conveyer, in storing them on said downwardly moving side, in transferring the molds by means of said conveyer to a pouring station on the upwardly moving side thereof, in pouring the molds, in removing the poured molds from the conveyer, in separating the sand and castings, and returning the sand to position on the downwardly moving side for reuse.

3. The herein described process of providing for the handling and pouring of the product of a molding machine located on the downwardly moving side of an endless substantially vertically movable storage conveyer, which consists in forming the molds, in storing the molds on the downwardly moving portion of the conveyer, in transferring them by means of said conveyer to a pouring station on the upwardly moving side thereof, in pouring the molds, in removing the poured molds from the conveyer on the downwardly moving side, and in separating the sand and castings on said side and thereby returning the sand to position for reuse on the machine.

4. The herein described process of providing for the handling and pouring of mold products which consists in forming the molds adjacent to the downwardly moving side of an endless substantially vertically movable conveyer from sand located on said side, in storing them on the conveyer on the downwardly moving side, in transferring the molds thereby to a pouring station on

the upwardly moving side of the conveyer, in pouring the molds, in transferring the poured molds by means of the conveyer to a point of removal on the downwardly moving side, and then in separating the sand and the castings and returning the sand to position on said downwardly moving side for reuse.

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

EDGAR H. MUMFORD.

Witnesses:
REGINA BRADY,
LAURA E. SMITH.