Dec. 4, 1923. 1,476,069

W. J. GILMORE

METHOD OF AND MEANS FOR MAKING AND SETTING GREEN SAND CORES

Filed March 3, 1919

Fig. 1.

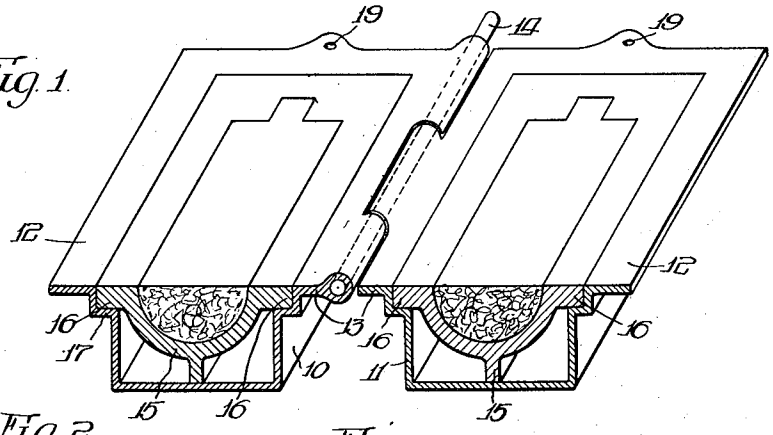


Fig. 2.

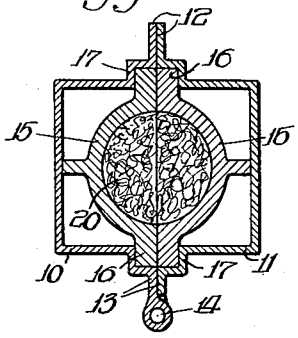


Fig. 3.

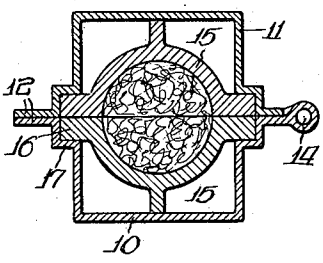


Fig. 4.

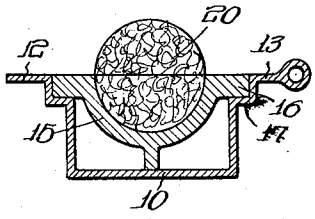


Fig. 5.

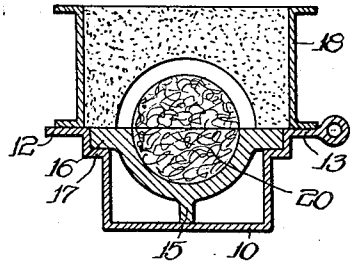


Fig. 6.

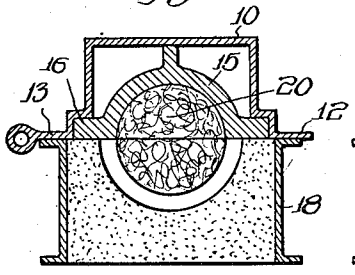


Fig. 7

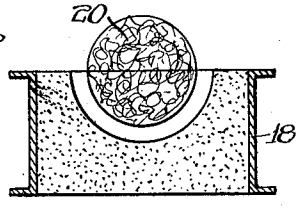
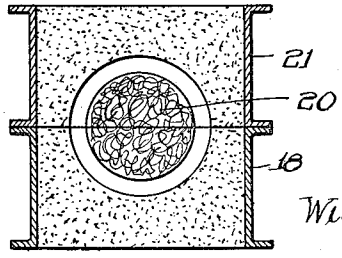


Fig. 8



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UNITED STATES PATENT OFFICE.

WILLIAM J. GILMORE, OF HAMMOND, INDIANA.

METHOD OF AND MEANS FOR MAKING AND SETTING GREEN-SAND CORES.

Application filed March 3, 1919. Serial No. 280,310.

To all whom it may concern:

Be it known that I, WILLIAM J. GILMORE, a citizen of the United States, residing at Hammond, in the county of Lake and State of Indiana, have invented certain new and useful Improvements in Methods of and Means for Making and Setting Green-Sand Cores, of which the following is a specification.

This invention relates to a method of and means for making and setting green sand cores.

As is well known in foundry practice, both dry sand and green sand cores are used, dry sand cores being molded to form and then laid on plates and dried or baked by artificial heat in an oven at a temperature of approximately 500° Fah., green sand cores being molded to the desired form and set into position in a sand mold without drying or baking. The baking process is quite expensive, as plates must be provided on which the cores are baked, the average foundry must have a large core oven capacity, the construction of ovens and their maintenance being a material item of expense, to which must be added the cost of fuel, attendance, etc. Space and racks must also be provided for cooling the cores after they have been taken from the oven in order that such cores may be handled by the workmen and set into their proper positions in sand molds. A dry sand core has a certain stiffness and surface hardness or firmness which makes it possible to handle the core rather roughly and set it into a mold with comparatively small loss from breakage. On the other hand, green sand cores must be handled very carefully and at best, in the practice thus far, the percentage of loss from disintegration and breaking off of small corners and projections is comparatively high. The green sand core could be used quite generally if it were not for the liability of breaking same in handling from the core box through the various stages of manufacture to its final position in the mold.

One of the objects of this invention is to make possible a more general use of green sand cores and at the same time substantially eliminate breakage thereof.

Another object is to provide a simple method of and means for making and setting green sand cores adapted to meet all of the requirements for good foundry practice.

These and other objects are accomplished by means of the method and mechanism illustrated on the accompanying sheet of drawings, in which—

Figure 1 is a perspective view of my improved core box showing the core in the making;

Figure 2 is a transverse sectional view of the core box and core showing the two halves of the core box brought together and in a vertical position;

Figure 3 is a sectional view of the same, one half of the core box being on top of the other;

Figure 4 is a similar sectional view with one of the halves of the core box removed;

Figure 5 is a sectional view similar to that shown in Figure 4, with the drag half of a flask mounted over the core box;

Figure 6 is a sectional view showing the parts as arranged in Figure 5 inverted;

Figure 7 is a sectional view similar to the one shown in Figure 6, with the other half of the core box removed; and

Figure 8 is a sectional view showing the cope half of the flask mounted over the drag half with the core set in position ready for the pouring operation.

The various novel features of my invention will be apparent from the following description and drawings, and will be particularly pointed out in the appended claims.

In putting my method into practice, I use a novel core box having two external half portions 10 and 11 provided with operating flanges 12 and 13, the latter of which may be hinged together by a pin 14. In each of the halves 10 and 11 of the core box there are mounted inner removable core box sections 15 having flanges 16 which are supported by shoulders 17 in the external core box sections 10 and 11. The inner surfaces of the internal core box sections 15 correspond in contour to that of the desired core.

As shown in Figure 1, green sand has been packed into the core box sections 15 and leveled off in the first step of forming the core. In the next step the two halves of the core box are moved into a vertical position, as shown in Figure 2, whereupon the two halves of the green sand core are brought together, forming an integral

structure, it being appreciated that by swinging both halves of the core box into a vertical position, there is little or no tendency for parts of the core to break away. The core box is then moved through an angle of 90°, with one-half of the core box being on top of the other, as shown in Figure 3. With the core box in this position the hinge pin 14 may be removed, whereupon the upper half 11 of the core box with its inner core box section 15 may be removed from its mating half, as shown in Figure 4. The next step in the operation is to set a completed drag half 18 of the sand mold on top of the core box half 10, which contains the complete core, as illustrated in Figure 5, it being understood that the drag half 18 of the flask is provided with suitable projections which are received by the openings 19 formed in the end flanges of the core boxes 10 or 11, as the case may be, thereby properly aligning the parts in question. The drag half of the flask and core box half 10 are inverted in position from that shown in Figure 5 to that shown in Figure 6, whereupon the core 20 no longer is held in the core box, but is supported in the mold in the drag half of the flask. After slightly tapping the core box half 10, the same, with its inner section 15, may be removed, leaving the core within the mold, as shown in Figure 7, whereupon the completed cope half 21 of the sand mold may be placed over the drag half 18 thereof to complete the mold, whereupon the latter may receive molten metal.

It will be noted in this method of making and setting a green sand core that the core is not removed from the core box until it is set direct into the mold, thus avoiding all handling of the formed core separately as such and thereby avoiding the usual handling of the core. By means of this method there is little or no chance for the core to become damaged, broken, or disintegrated. This method makes it possible to use a green sand core where otherwise it could not be used, and it enables cores of more or less intricate shape to be made of green sand than otherwise could be made and handled.

The core box preferably is made of metal and in two halves, each half including a removable internal part. The external parts of halves 10 and 11 of the core box necessarily must be made with the flanges 12 and guide pin holes 19, etc., to match the flasks that are to be used for the sand mold, and the core box halves must be hinged together more or less accurately with a well fitting hinge pin. It will be appreciated that with a core box having the external halves of a given size to fit standard flasks any suitable size or shape of internal core box sections 15 may be used to form cores of various shapes and dimensions, it being necessary only that the flanges 16 of the internal core box sections be made to rest upon and properly fit the shoulders 17 of the external core box sections. In other words, to change the shape or size of the core, it would be necessary only to change the internal core box sections 15. These internal core box sections 15 may be of metal where a large number of cores are required to be made, or they may be made of wood, making the construction cheaper in those cases where only a small number of castings are to be made.

It is apparent that there may be various modifications of the invention herein particularly shown and described, and it is my intention to cover all such modifications falling within the spirit and scope of the following claims.

I claim:

1. The method of making and setting a green sand core consisting in forming said core in a core box consisting of separable parts, removing one of said separable parts and mounting a flask section upon the remaining core box part in cooperative relation with said core, inverting said flask section and said last mentioned core box part, removing said last mentioned core box part and applying the remaining flask section.

2. The method of making and setting a green sand core consisting of forming said core in a core box, which core box consists of separable parts, either of which may be removed from the other without disturbing said core, removing one of said core box parts, mounting a flask section above the remaining core box part in cooperative relation with said core, inverting said flask section and last mentioned core box part, removing said last mentioned core box part and applying the remaining flask section.

3. The method of making and setting a green sand core consisting in forming said core in a two-part core box, each of said parts being removable from the other without disturbing said core, removing one of said core box parts and substituting therefor one section of a flask, inverting said members, removing the other core box part and substituting therefor the complementary flask section.

4. The method of transferring a sand core from a core box to a mold consisting first in substituting one part of the mold for a part of the core box, and then substituting another part of the mold for another part of the core box.

5. The method of transferring a core from a core box to a mold consisting first in substituting the drag half of the mold for a part of the core box, and then substituting the cope part of the mold for another part of the core box.

6. The method which consists in providing

a green sand core between symmetrical separable mating halves of a core box, separating said mating halves, leaving one of said mating halves with the core therein with said core on the upper side thereof, setting a completed drag half of a flask down over said core box half containing said core to engage with said core, inverting said drag half and core box half, removing said core box half while leaving said core in said drag half, and applying a completed cope half to complete a mold.

Signed at Chicago, Illinois, this sixth day of February, 1919.

WILLIAM J. GILMORE.