April 28, 1925. 1,535,186

J. T. STONEY

CORE FOR CASTING MOLDS

Filed Dec. 10, 1923

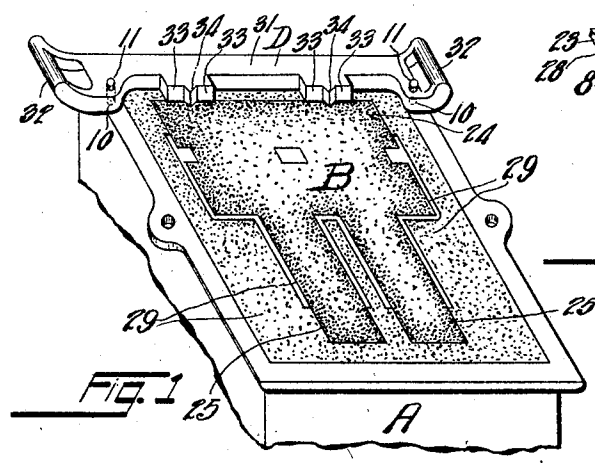


Fig. 1

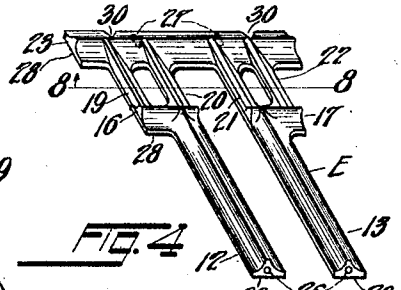


Fig. 4

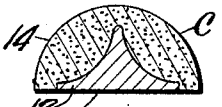


Fig. 5

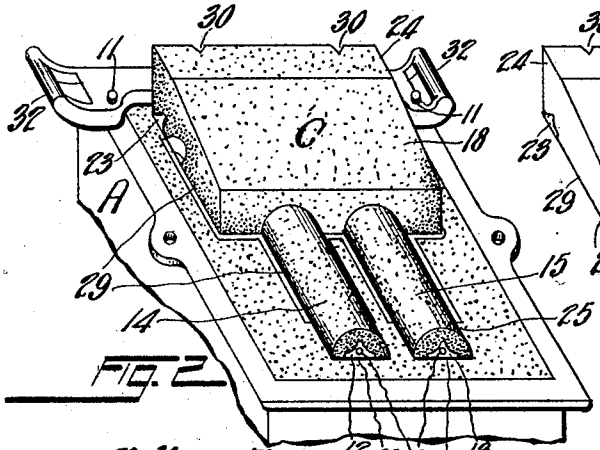


Fig. 2

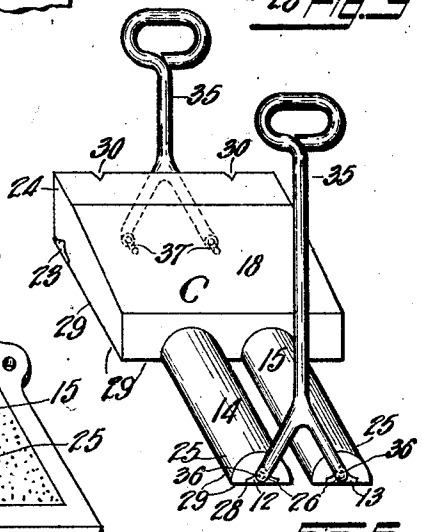


Fig. 6

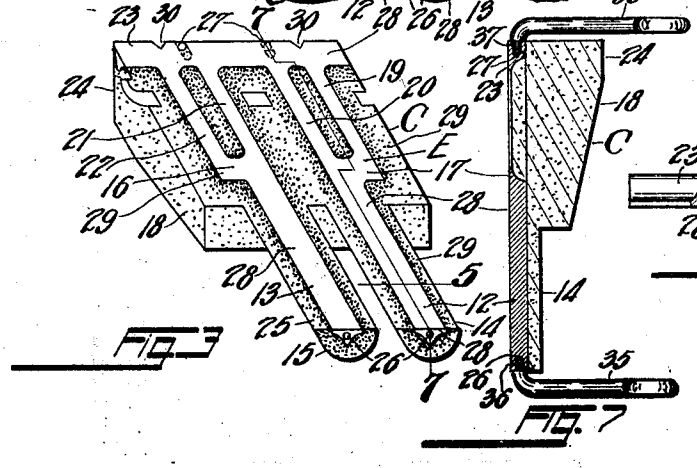


Fig. 3

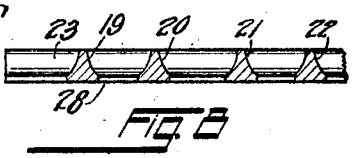


Fig. 8

Fig. 7

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UNITED STATES PATENT OFFICE.

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CORE FOR CASTING MOLDS.

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To all whom it may concern:

Be it known that I, JOHN T. STONEY, a citizen of the United States, residing in Lakewood, county of Cuyahoga, and State of Ohio, have invented a new and useful Improvement in Cores for Casting Molds, of which the following is a specification.

My present invention relates to the construction of cores for castings generally and to the construction of combined dry sand and green sand cores particularly.

The object of my invention is an efficient core means to facilitate and speed up the production of castings.

Cores for castings are generally made as dry sand cores which means that these cores are made up of green core sand and are then baked so that they can be handled and placed into the mold without breaking or otherwise deforming or injuring them. Such procedure requires considerable time for baking as well as expense for heat, handling, etc. Furthermore, the sand used for such dry cores must be mixed with some binding agent so that the core will not break up after baking. After such a dry core has been used for casting purposes, the heat of the casting burns up this binding agent and leaves a residue as ash which renders this sand useless for further casting purposes. These baked cores are also much more difficult to remove from a casting than green sand cores. The present invention aims to eliminate these dry sand cores and substitute therefor green sand cores which are easily removable from the casting, require no baking, and the sand of which can be used again for casting purposes.

In the present invention I propose to use one portion of the core made of green sand and the other portion of dry sand. Both portions of the core may be made of green sand but I find that a new invention is involved in making both portions of green sand which requires a separate application for patent.

The present invention is illustrated in the accompanying drawing which shows a core structure made in two halves for the cylinder of an internal combustion engine which structure constitutes one embodiment of my invention but is susceptible to changes and modifications. In this drawing, Fig. 1 is a perspective view of the top portion of a casting mold with the dry sand half of the core in place and the jig on the mold all ready to receive the green sand half of the core; Fig. 2 is a perspective view similar to Fig. 1 with the green sand half of the core in place over the dry sand half of the core; Fig. 3 is a perspective view of the green sand half of the core showing the arbor impressed in the sand; Fig. 4 is a perspective view of the arbor; Fig. 5 is a section, taken on the line 5 indicated in Fig. 3, showing the transverse relation between the arbor and the green sand half of the core and the typical formation of the arbor members on a larger scale; Fig. 6 is a perspective view of the green sand half of the core with the handles in place ready for superimposing over the dry sand half of the core; Fig. 7 is a section, taken on line 7—7 indicated in Fig. 3, showing the longitudinal relation between the arbor and the green sand half of the core; Fig. 8 is a section, taken on the line 8—8 indicated in Fig. 4, showing the typical formation of the arbor members on a larger scale.

Similar reference characters refer to similar parts throughout the views.

The casting mold shown in the accompanying drawing comprises, principally, the flask A, the dry sand half of the core B, the green sand half of the core C, the jig D, and the arbor E.

The flask A may be of any suitable construction and is provided with the holes 10 for the index pin 11 which is secured to the jig D. As at present advised, I first make the mold in the flask in a determined relation to the holes 10 for the purpose appearing presently.

The dry sand half B is then made in the usual manner and is then placed into this mold in the usual manner as seen in Fig. 1.

The green sand half C, however, must be provided with some stiffening and handling means to permit such half to be placed into the mold without damage thereof. For such stiffening means I provide, in the present instance, the arbor E composed of the members 12 and 13 extending into the cylinder portions 14 and 15, respectively, the members 16 and 17 located in the upper portion of the crank case portion 18 of the core, the members 19, 20, 21, and 22 extending downward from the members 16 and 17 through the portion 18, and the member 23 connecting the members 19, 20, 21 and 22 and disposed along the outer end of the core print 24. The members 12 and 13

extend to the outer end of the core prints 25 and each is provided with an aperture 26 to engage a handle as will appear presently. The member 23 extends to the outer end of the core print 24 and is provided with two apertures 27 to engage a handle as will appear presently.

The arbor E is, preferably, made of cast iron, has the surfaces 28 of the several members in the same plane but the other surfaces thereof may be curved or otherwise formed or deformed to facilitate the adherence of the sand thereto.

As seen in Figs. 3, 6, and 7, this arbor is impressed into the green sand half C, either while the core is being made or afterward, so that the surfaces 28 thereof are disposed in the same plane as the surfaces 29 which here represents the parting of the mold and of the core.

It is understood, however, that the arbor may be completely embedded in the sand; the manner of impressing the arbor in the sand as shown in the drawing is most convenient for either machine or for hand production of cores and the flat surfaces 28 afford a substantial support for the green sand cores on the dry sand cores.

Since the arbor is made of one piece, it forms a rigid core unit of its own and supports and connects and stiffens all portions of this green sand core so that the same can be handled readily and without injury thereto. This arbor structure has the further advantage of presenting metal surfaces on the outside of the core where a substantial handling means can take hold of it without contacting the green sand.

It is observed that the members of the present arbor are so arranged that the arbor as a whole can readily be withdrawn from the core after the casting is poured so that such arbors can be used again for core purposes.

The V grooves 30 are provided in the member 23 in certain relation to the core C.

The jig D has the body 31 with the handles 32 on each end thereof. The pins 11 locate this jig on the mold in certain position as previously mentioned and consequently also locates it in certain relation to the core which is located by the core prints of the mold. The inner edge of the body 31 is provided with the flat gauge surfaces 33 so located that the end of the core print 24 abuts thereon when the core C is in proper position in relation to the mold and the core B.

From these flat surfaces 33 extend the V projections 34 spaced in the same relation to the core C as the V grooves 30 so that these grooves 30 abut the respective V projections 34 when the core is in proper place. The core C is located in one direction by the surfaces 33 and in the other direction by the V projections 34 and is thereby definitely and correctly located in relation to the mold and to the core B.

In the present instance, the handling means for the core C comprises a pair of handles 35; one of the handles is provided with the pegs 36 to engage the apertures 26 and the other handle is provided with the pegs 37 to engage the apertures 27.

It will be seen that, when the core C is made up as shown, the handles 35 may be applied as indicated in Figs. 6 and 7 whereupon the core C can be handled without contacting the sand thereof.

It is observed that, with the present invention, no part of the arbor projects beyond the boundaries of the core, that the arbor can readily be taken hold of for the purpose of handling the core, that the core can be made in the usual core-box without any special provisions for accommodating the arbor, and that no special provisions are required on the flank to accommodate the arbor.

The present invention is illustrated in a mold for a simple cylinder casting but is applicable to other castings.

Without limiting myself to the precise construction and arrangements shown and described,

I claim:—

1. A core for a casting mold having an arbor within the boundaries of said core, portions of said arbor extending to the end of said core and provided with apertures to permit of taking hold of said arbor for handling said core without contacting the sand thereof.

2. A core for a casting mold provided with oppositely disposed core prints, an arbor in said core and portions thereof projecting through said core prints and the ends of these projecting portions within the boundaries of the ends of said core prints and these portions provided with apertures to permit of taking hold of said arbor for handling said core without contacting the sand thereof.

3. In combination, a casting mold, a divided core comprising one portion composed of dry sand and placed in said mold in the usual manner, and the other portion composed of green sand and provided with means for superimposing the same over the first said portion without contacting said green sand; said means comprising, an arbor impressed in said green sand and the ends thereof flush with the ends of said other portion and provided with apertures to permit of taking hold of said arbor for handling said other portion without contacting the sand thereof.

4. In combination, a casting mold, a divided core comprising one portion composed of dry sand and placed in said mold in the

usual manner, the other portion composed of green sand and provided with means for superimposing the same over the first said portion without contacting said green sand, and means for locating said other portion in relation to said first portion; said locating means comprising, a jig for said mold and provided with means for locating the same in certain relation to the first said portion of the core and provided with means for guiding said other portion, and means on said other portion for contacting said guiding means on said jig.

5. In combination, a casting mold, a divided core comprising one portion composed of dry sand and placed in said mold in the usual manner, the other portion composed of green sand, an arbor impressed in said green sand and provided with means for taking hold thereof, a jig provided with means for locating the same on said mold in certain relation to the first said portion of the core and provided with means of guiding said other portion, and means on said other portion for contacting said guiding means on said jig.

6. In combination, a casting mold, a divided core comprising one portion composed of dry sand and placed in said mold in the usual manner, an other portion composed of green sand, an arbor impressed in said green sand and portions thereof extending to the ends of said one portion and being flush therewith, each extending portion provided with apertures to engage a handling means, a jig provided with means for locating the same on said mold in certain relation to the first said portion of the core and provided with means for guiding said other portion of the core, and means on said other portion for contacting said guiding means on said jig.

JOHN T. STONEY.