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C. C. SMITH.
APPARATUS FOR DRYING MOLDS
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NO MODEL.

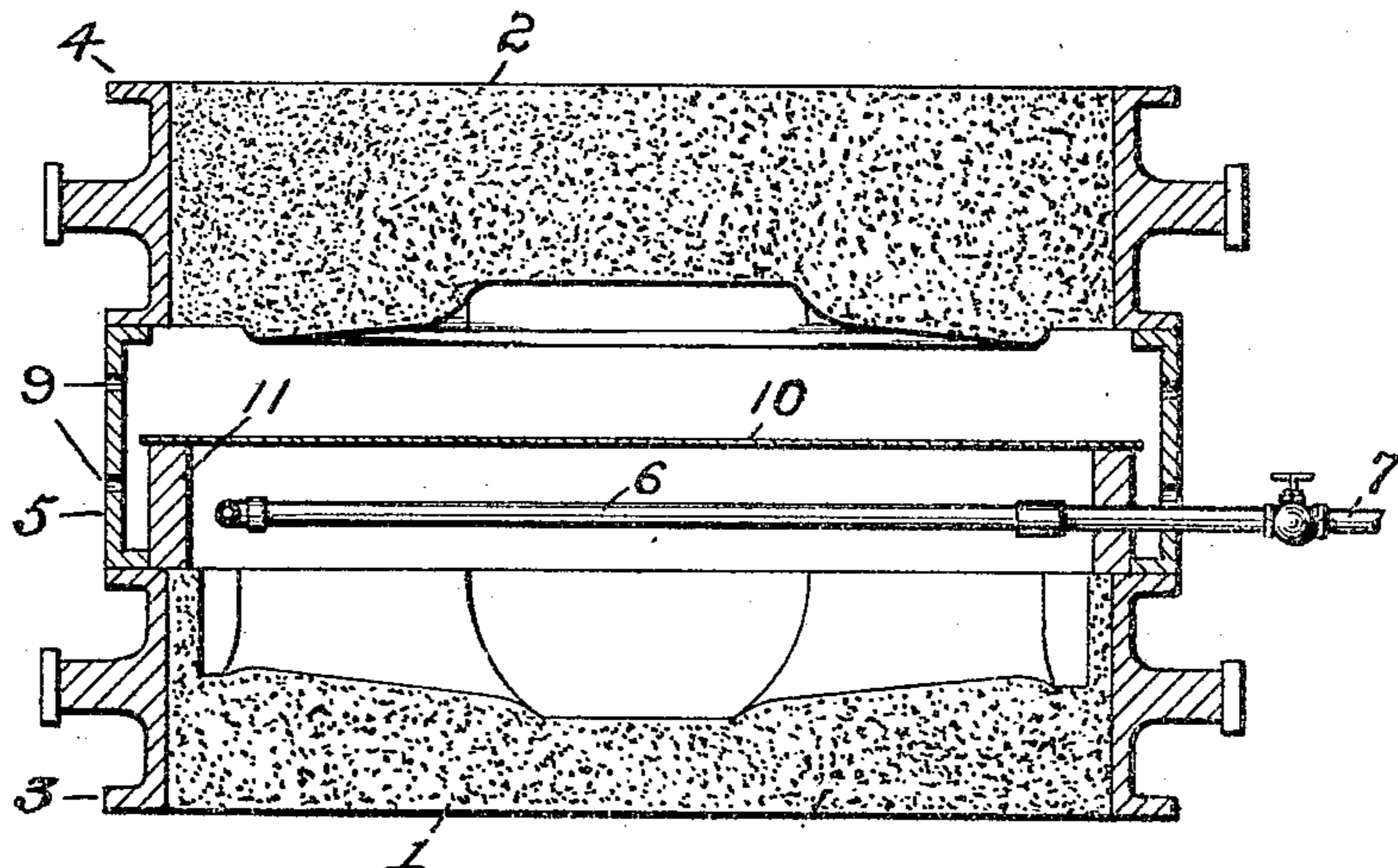


Fig. 1

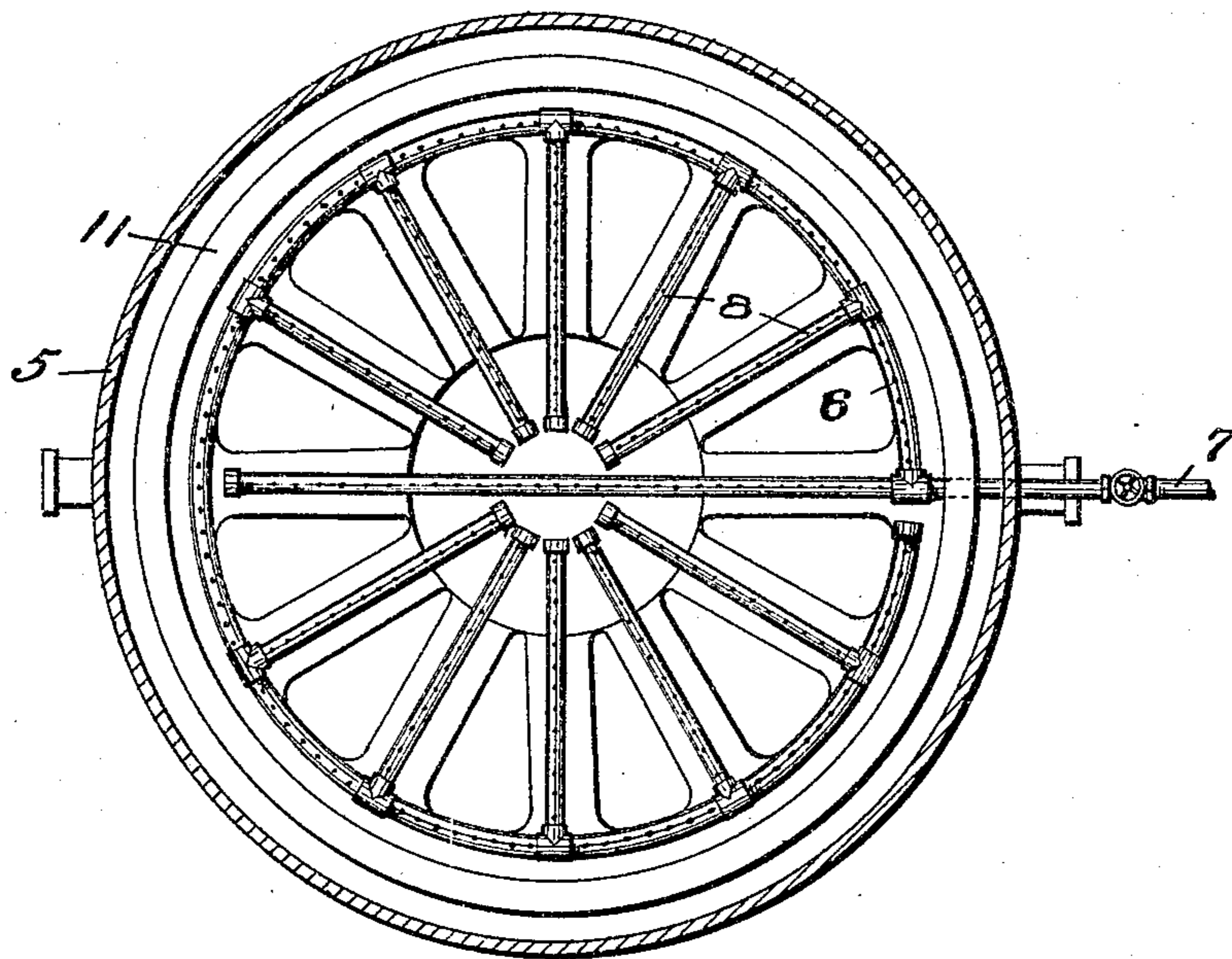


Fig. 2

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APPARATUS FOR DRYING MOLDS.

SPECIFICATION forming part of Letters Patent No. 773,683, dated November 1, 1904.

Application filed August 15, 1904. Serial No. 220,829. (No model.)

To all whom it may concern:

Be it known that I, CAMERON C. SMITH, a resident of Oakmont, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Drying Molds; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to apparatus for drying sand molds in steel-foundries.

The object is to provide means whereby large flat molds can be dried on the pouring-floor, and in such a manner that both the cope and drag will be uniformly dried and the cope prevented from burning.

In the making of steel castings it is essential that the sand molds be dried or at least provided with dry faces. The most common practice has been to bake the molds in a suitable furnace or oven, thus thoroughly drying out the same. One objection to this practice is the difficult labor necessary for handling large-sized molds and the liability of injuring or cracking the same by such handling; but the most serious objection to this practice is that the molds are dried throughout and are baked quite hard, so much so that they do not crumble or break down readily. Large-sized castings, especially flat castings, such as locomotive main frames and the like, shrink very materially while cooling. The baked molds, however, do not break or disintegrate under the shrinkage of the castings, and as a result the latter become strained and frequently are full of shrinkage cracks, due entirely to the hardness of the baked mold. It is therefore highly desirable that the sand molds for steel castings, and especially for large flat castings, be dried only on their faces, leaving the main body thereof easily friable, so that the mold will readily break down under the strains due to the shrinkage of the castings, thus preventing any strains in said castings. It has heretofore been proposed to dry sand molds on their surfaces only, but without much success.

My invention has for its object to dry these sand molds on their surfaces only and by means of apparatus which is simple, which can

be applied on the casting-floor, so as to obviate the handling of the molds to any great extent and without handling the drag at all, and in which means is provided for so distributing the heat that the cope and drag are uniformly dried.

To this end the invention consists, generally stated, in superimposing the cope and drag one above the other and introducing between the same a horizontally-arranged perforated gas-pipe, by means of which gas can be burned in the mold-cavity between the cope and drag, thus furnishing the heat for drying the same. Means is also provided for distributing this heat, so that the cope will not become burned and the drag remain underdried, this means preferably being a baffle-plate or wall supported between the flame and the cope.

In the accompanying drawings, Figure 1 is a vertical section through a cope and drag, showing my drying means applied thereto; and Fig. 2 is a plan view of the same with the cope and baffle-plate removed.

In the drawings the invention has been shown as applied to the drying of a mold for casting spoked wheels; but this is for purposes of illustration only.

It will be understood that the invention can be applied to the drying of any molds whatsoever having a cope and a drag, and more especially to the drying of molds for making large flat castings.

1 represents the drag, and 2 the cope, which will be formed in the usual or any desired way in the flask-sections 3 and 4. My heating apparatus is such that it can be applied directly on the pouring-floor, and as a consequence the drag need not be moved at all after forming the same, and the cope will receive only the minimum amount of handling. In this way straining or injuring the molds is largely avoided. After the molds are formed the cope will be placed over the drag and preferably spaced some distance therefrom. This can be conveniently done by interposing a flask-section 5 between the drag and cope, thus holding them the desired distance apart. A perforated gas-pipe 6 will be introduced in the

space between the drag and cope and will be connected to a suitable supply-pipe 7, provided with a controlling-valve. The perforated pipe 6 will be provided with branches or arms 8 sufficient to reach all portions of the mold-cavity. As shown in the drawings, these branches are arranged radially and in the spoke-spaces of the wheel-mold. It will be understood, however, that the arrangement will vary widely, according to the character of article to be cast. Generally, however, a perforated gas-pipe will be located in or over the deeper parts of the mold-cavity, so that the heat will be uniformly distributed to all portions of the mold-faces. The pipe 6 and arms 8 form, in effect, a horizontally-arranged circular gas-burner.

In the drying of the mold the gas will be burned in the cavity between the drag and cope, thus supplying the requisite heat for drying the mold-faces. Air-openings 9 will be provided in the spacing member 5 or other part in order to supply the necessary oxygen to support combustion. The heat can of course be continued any length of time, so that any desired degree of drying the mold-faces can be secured. Heat naturally rises, and as a consequence the cope is inclined to be dried to a greater extent than the drag, and the flame from the gas-pipe also would have a tendency to burn the cope while the drag would probably remain underdried. To prevent this and secure uniform drying of the cope and drag, means are provided for arresting the up-flow of the heat and flame and deflecting a portion thereof downwardly against the drag. This can be conveniently done by interposing a baffle-wall between the flame and the cope, this baffle-wall being shown as a thin metal plate 10, supported in any convenient way—such as upon the ledge 11, above the gas-pipe 6, and between the same and the cope-face. This plate will prevent the flame from reaching the cope-face and will reflect the heat and throw the same down upon the face of the drag. The plate at the same time will conduct sufficient heat to efficiently dry the face of the cope.

The manner of using the apparatus described will be readily understood from the foregoing description. By means thereof the faces of the mold and drag will be thoroughly and uniformly dried, and all danger of burning the face of the cope avoided. The heat can be continued for any length of time so as to get thoroughly-dry mold-faces. At the same time only the faces of the molds will be dry and hard, the heat penetrating into the same to a depth depending upon the length of time that the heat is continued. The greater portion of the mold-body, however, will still be moist, and as a consequence will easily

disintegrate or break down. Hence when the casting shrinks the mold instead of offering a resistance to the shrinkage thereof and putting the same under strain will readily break down, thus permitting the natural and uniform shrinkage of the casting. In this manner shrinkage cracks are very largely overcome. This manner of drying the molds is of special value, as above stated, with molds for large flat castings, the principal advantage being in avoiding shrinkage cracks. Another advantage is in the fact that the drag need not be handled at all, and the cope need receive only the minimum amount of handling. It will be readily seen that with molds for large-sized castings the conveying of the molds to the baking-oven to dry the same and back again requires considerable handling and gives opportunity for straining or cracking the molds themselves. By my arrangement not only is the work of handling dispensed with, but liability of injuring the molds is almost entirely overcome.

What I claim is—

1. In apparatus for drying sand molds, the combination of the drag and cope, a spacing member for supporting the cope above the drag, and a horizontally-arranged perforated gas-pipe projecting into the space between the cope and drag.

2. In apparatus for drying sand molds, the combination with the cope and drag, means for supporting the cope above the drag, a horizontally-arranged gas-burner projecting into the space between the cope and drag, and means for deflecting a portion of the heat downwardly against the drag.

3. In apparatus for drying sand molds, the combination of the cope and drag, means for supporting the cope above the drag, a horizontally-arranged gas-burner projecting into the space between the cope and the drag, and a heat-and-flame arresting member placed above said pipe and between the same and the cope.

4. In apparatus for drying sand molds, the combination of the cope and drag, means for supporting the cope above the drag, a horizontally-arranged gas-burner projecting into the space between the cope and drag, and a metal plate supported above said pipe and between the same and the cope.

5. In apparatus for drying sand molds, the combination of the cope and drag, means for supporting the cope above the drag, a gas-pipe provided with arms or branches projecting into all portions of the mold-cavity and being perforated, and a heat-arresting member placed above said pipe and between the same and the cope.

6. In apparatus for drying sand molds, the combination of the cope and drag, a spacing

member for supporting the cope above the
drag, a horizontally-arranged perforated gas-
pipe projecting through said spacing member
and lying between the cope and drag, and a
5 heat-and-flame arresting member supported
above said pipe and between the same and the
cope.

In testimony whereof I, the said CAMERON
C. SMITH, have hereunto set my hand.

CAMERON C. SMITH.

Witnesses:

ROBERT C. TOTTEN,
G. KREMER.