

(No Model.)

2 Sheets—Sheet 1.

S. J. ADAMS.
SAND MOLD.

No. 539,209.

Patented May 14, 1895.

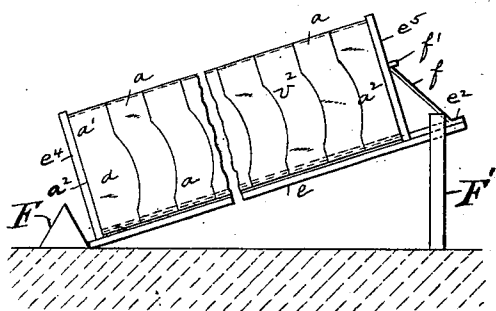
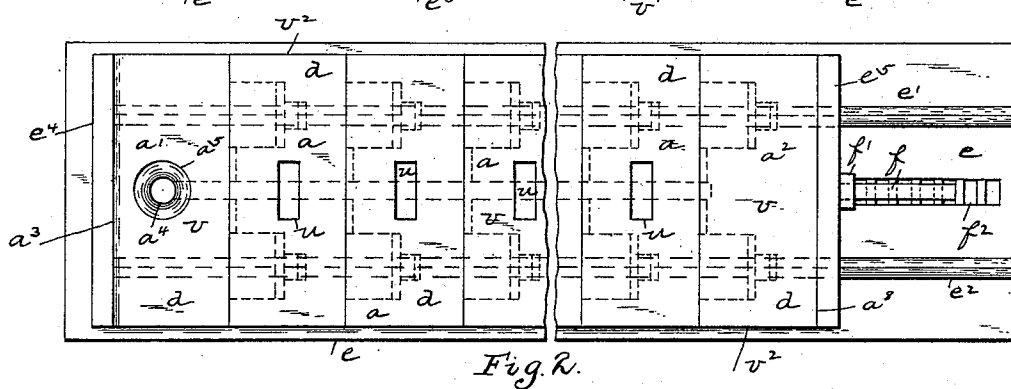
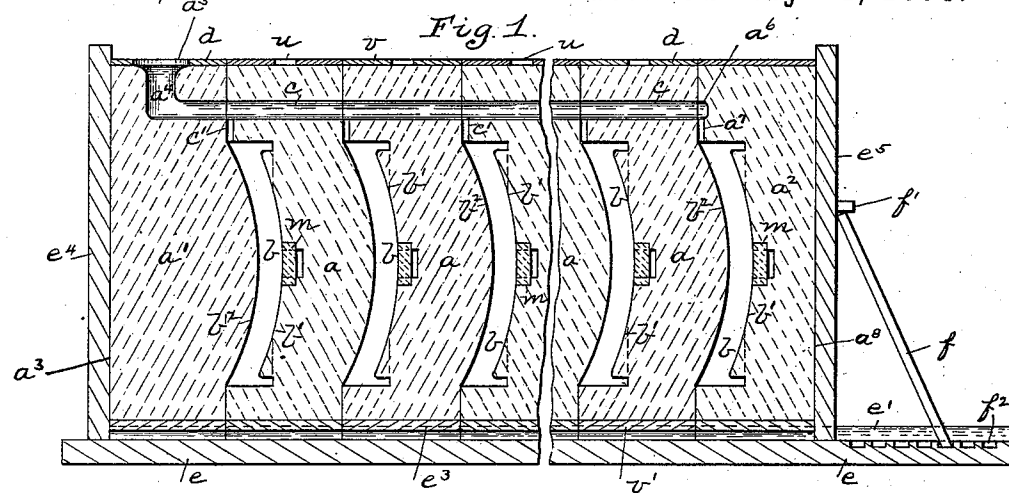


Fig. 3.

Sir:—
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 5.

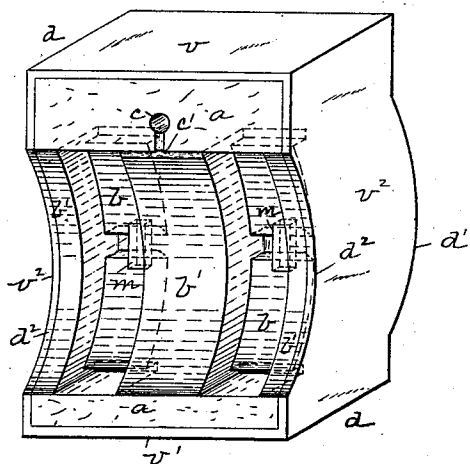


Fig. 6.

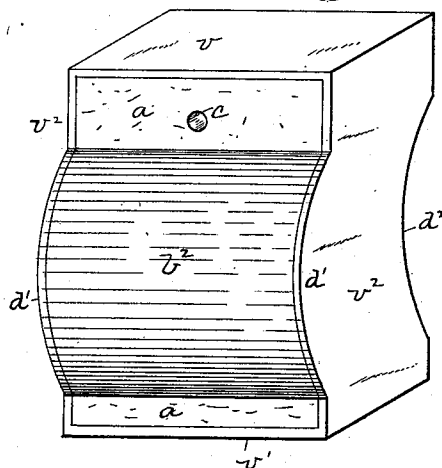


Fig. 4.

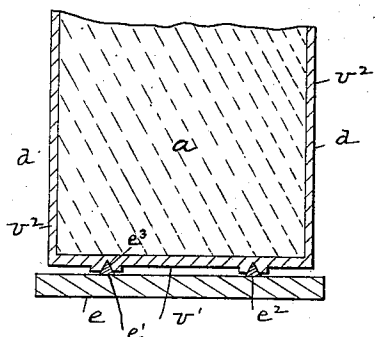


Fig. 7.

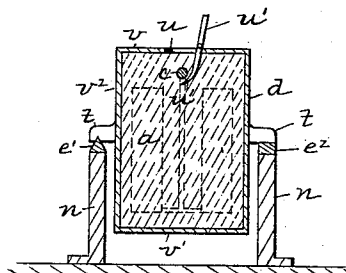
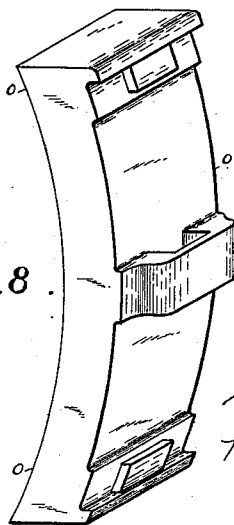


Fig. 8.



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UNITED STATES PATENT OFFICE.

STEPHEN JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

SAND MOLD.

SPECIFICATION forming part of Letters Patent No. 539,209, dated May 14, 1895.

Application filed October 24, 1892. Serial No. 449,904. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN JARVIS ADAMS, a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Sand Molds; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to sand molds and molding apparatus, having special reference to that class of molds which are arranged to be cast together by means of a continuous inclosed runner extending through a series of molds and communicating with the down take channels or runners leading to the mold cavity, the broad idea of which is described in the application filed by me of even date herewith, Serial No. 449,905.

The invention specially relates to the building up of such molds in a series so that they may be cast through the medium of the continuous runner and yet the flask bodies act to give support to the sand molds during the casting operation, so overcoming the necessity of the use of special means for confining the molds during the casting of the metal.

To these ends my invention consists, generally stated, in the combination of a series of molds set in line and in contact with each other, and confined within flasks set on end so that they serve to confine the sand on the top, bottom, and sides thereof, while the faces of the molds in contact with each other complete the means for support thereof during the pouring operation, and a continuous runner inclosed within the flasks and extending through the sand of the several molds above the mold cavities thereof, and runners leading to the mold cavities.

It also consists in certain other improvements, as will be hereinafter more particularly described and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is an enlarged longitudinal vertical section of a series of mold-sections embodying my invention. Fig. 2 is a top view of the same. Fig. 3 illustrates the method in which the several series of molds are brought into proper position. Fig. 4 is a cross-section

of one of the molds when placed upon the stacking-platform. Figs. 5 and 6 are perspective views of the different faces of said mold-sections. Fig. 7 is a view showing another manner of guiding the molds to place, and Fig. 8 is a perspective view of a brake-shoe formed by my invention.

Like letters of reference indicate like parts in each figure.

My invention is illustrated principally in connection with the casting of brake shoes, although it may be used in the manufacture of any other desired form of castings.

In Figs. 1, 2, and 3 I have shown the several mold sections *a a* in their completed form and ready for the pouring of the metal. These several mold sections *a a* have formed in them a number of mold cavities *b*, the concave portions *b'* of these mold sections *b* being on one side of the mold sections *a a*, and the convex portions *b²* for closing the mold cavities *b* being on the opposite side of the mold sections *a a*. A continuous gate *c* is formed at one side of the mold cavities *b* and inclosed within the mold sections *a a* which has the runners *c'* leading therefrom into the mold cavities *b*, these mold sections *a a* having been previously formed in the flasks *d* in the manner hereinafter described, and after their formation placed upon the stacking platform *e*, this stacking platform *e* being preferably placed on an incline, its lower end resting against a stop *F* on the floor and its upper end resting on a post or stand *F'*. The stacking platform has also the rails *e' e²* thereon for supporting the flasks *d* and guiding the several mold sections *a a* to place, the rails being preferably triangular or V-shaped in cross section and fitting into the seats *e³* in or on the bottom of the flasks *d*, so that the several mold sections *a a* may be more accurately guided into position on the stacking platform, as shown in Fig. 3, and upon which the mold sections *a a* are placed as soon as they are formed. As the molds are thus placed in line and in contact with each other, it will be seen that as the flasks *d* entirely surround the different molds in the series forming the tops *v*, bottoms *v'*, and sides *v²*, they give a support entirely around the bodies of the molds so that as soon as the molds are placed in line and clamped together, they are ready for pouring, requiring only the

connection of the pouring reservoir to feed the metal thereto. For certain classes of molds it is desirable to employ these flasks with the molds and to support the molds in this way during the pouring operation.

The stacking platform *e* has the clamping plate *e*⁴ at its lower end, which acts as an abutment or stop for the several mold sections *a* as they are directed to position thereon, and after all the mold sections are in position on the stacking platform *e*, another clamping plate *e*⁵, or like device, is placed against the several mold sections *a* and clamps them together by suitable means, such as a brace rod *f*, the upper end of which fits under a lug *f*¹ on the clamping plate *e*⁵, while its lower end fits into one of the seats *f*² formed in the stacking platform *e* and so acts to clamp the several mold sections *a* firmly together that the series of molds on the platform can be moved from place to place. When the stacking platform is on an incline and before the mold sections *a* are placed thereon, I slide the end mold section *a*¹ into place on the stacking platform *e*, this end mold section *a*¹ having on one side a flat face *a*³ for abutting against the clamping plate *e*⁴ at the lower end of the stacking platform *e* and having on the opposite side one of the convex portions *b*² which closes and forms part of the configuration of one of the mold cavities *b* being opposite to the concave portion *b*¹ in the mold section *a*. This end mold section *a*¹ has the gate *a*⁴, communicating with the pouring hole *a*⁵ in the flask *d*, and which forms part of the continuous gate *c* in the mold sections *a*.

In order to properly brace and support the convex portions *b*² and to better guide the different mold sections to place, I form on one side of the flasks *d* the projections *d*¹ corresponding in shape and size to the convex portions *b*², while the opposite side of each flask is recessed at *d*² in such manner as to permit the entrance of the projections *d*¹ and the convex portions *b*² therein, so forming a tongue and groove joint as is shown more particularly in Figs. 5 and 6. After the mold sections *a* *a*¹ are placed on the stacking platform *e* and in position, the other end mold section *a*² is placed against the mold sections *a*, its concave portion *b*¹ forming the configuration necessary to complete one of the mold cavities *b*, being opposite to the convex portion *b*² of the mold section *a*, while inclosed with the mold section *a*² is the gate *a*⁶ having the runners *a*⁷ leading therefrom into the mold cavity *b*. The mold section *a*² has also the flat face *a*⁸ against which the clamping plate *e*⁵ abuts to complete the mold.

The several molds shown can be formed by any suitable molding apparatus, molding apparatus suitable for the purpose being shown in application for patent filed by me May 11, 1894, Serial No. 510,846.

In Fig. 7 is shown another manner of sliding the different mold sections into position, the rails *e*¹ *e*² being supported by the stand-

ards *n* raised above the floor line, and the flasks *d* having flanges *t* extending out therefrom and sliding on the rails *e*¹ *e*² into position. As it is evident that if the metal were permitted to set in the continuous runner all the castings formed in the series of molds would be secured together within such series of flasks and it would be difficult to remove them, I employ with the set or series of molds the means of severing the castings from each other. The flasks themselves having the transverse slots *u* through which the cutter *u*¹ can be introduced to cut through the metal in the continuous runner after it is somewhat set and while it is still sufficiently plastic so that each mold may be separated from the one adjoining it and the separate casting in that mold be removed.

The operation of building up the sand molds and employing the invention above described is as follows: The end mold section *a*¹ can first be formed in any suitable way so as to form the convex portion *b*² thereon. It is then placed upon the stacking platform *e*, and through its inclination slides to place against the clamping plate *e*⁴ along the rails *e*¹ *e*². The other mold sections *a* are then formed in any suitable way with the mold cavities *b*, the concave portions *b*¹ and the continuous gates *c*; and they are then placed upon the stacking platform *e* in such manner that the concave portion *b*¹ will be opposite to the convex portion *b*² of the end mold section *a*¹ so completing one of the mold cavities *b*. When the required number of the mold sections are formed and placed upon the stacking platform *e* in such manner that their faces will form the mold cavities *b* and the continuous gate *c* in line with each other, the end mold section *a*² is formed in like manner, having a flat face *a*⁸ to receive the pressure of the clamping plate. The clamping plate *e*⁵ is then secured in position on the stacking platform against the flat face *a*⁸ of the end mold section *a*², and the platform is then lowered so as to bring the molds on substantially the same horizontal plane, when the mold is then ready for casting, and it may be carried to any suitable point, such as out on the foundry floor or directly to the cupola, and the molten metal then poured through the continuous runner.

In forming the molds, the metal flows from the pouring gate or reservoir into the continuous runner and thence flows into the mold cavity or cavities fed by the first down take channel or runner leading therefrom, and when these are filled flows on into the next, and so on through the series until all the mold cavities are filled with metal. During this operation as the molds are braced against each other and the walls between the castings are of sufficient thickness to sustain the body of metal, and as the flasks surround the bodies of the molds, it is evident that the molds are fully supported to sustain the weight of the metal and all the advantages of

casting the metal from one main point into the mold cavities in the series of molds, as described in said other applications, are obtained. At the same time as the different molds have on one side the portion of one mold cavity and on the other side the portion of the other mold cavity, a large number of such molds can be placed within a comparatively small space which is of very great importance, especially in small foundries. When the metal is set sufficiently, but while it is still plastic, the metal in the continuous runner may be cut as above described, and when it is desired to open the mold the clamping plate *c*^b is released and dropped out of the way and each flask can easily be withdrawn from the adjoining one, the sand and casting therein be removed, and the flasks are then ready for use again.

The employment of the flasks in a vertical position enables me to employ both faces thereof in forming the mold cavities, and at the same time gives a strong and simple support for the molds to retain the sand during the casting operation.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In sand molds, the combination of a series of molds set on end or edge, each section being surrounded by a flask which confines the top, bottom, and sides thereof, said molds having their exposed faces in contact so as to form a continuous line of molds, and a continuous runner formed within the flasks and extending through the sand of the molds above the mold cavities and communicating with down-take passages leading to the mold cavities of the series of molds, substantially as set forth.

2. In sand molds, the combination of a series of molds set on end or edge, each section being surrounded by a flask which confines the top, bottom, and sides thereof, said molds having their exposed faces in contact so as to form a continuous line of molds, a continuous runner extending through the sand of the several molds within the flasks above the mold cavities, and down-take passages leading from the runner to the mold cavities, the flasks having openings therein in line with such continuous runner, and a cutter adapted to pass through such openings and sever the metal in such continuous runner, substantially as set forth.

3. In sand molds, the combination of a series of molds set on edge and in contact with

each other and contained within separate flasks which surround the same so as to inclose the top, bottom and sides thereof, each said mold having an irregular shape and the flasks being provided with projections corresponding to such irregular shape so as to give support to the projections in the irregular portions of the mold bodies, substantially as set forth.

4. In sand molds, the combination of a series of molds set on edge and in contact with each other, each having in or on one face a recess and in or on the other face a projection adapted to fit into said recess, the recess and projection extending to the edge of the mold, and flasks inclosing said molds and having corresponding recesses and projections so as to give support to the body of the mold, such recesses and projections of the flasks fitting one with the other, substantially as set forth.

5. In sand molds, the combination of a series of molds set in line and in contact with each other, of a portable stacking platform set on an incline to receive the molds as they are formed, substantially as set forth.

6. In sand molds, the combination with a series of flasks, of a stacking platform having guides thereon for directing said flasks into position on said stacking platform, substantially as set forth.

7. In sand molds, the combination with a series of flasks, of a stacking platform having a longitudinally extending rail thereon engaging with guides on said flasks for directing the same into position on the stacking platform, substantially as set forth.

8. In sand molds, the combination with a series of molds, of a stacking platform having a clamping plate at the end thereof, and a brace rod fitting against said clamping plate and engaging with the stacking platform, substantially as set forth.

9. In sand molds, the combination with a series of molds having mold supports, of a stacking platform having guides thereon for engaging with the mold supports and thereby directing said molds into position on said stacking platform, substantially as set forth.

In testimony whereof I, the said STEPHEN JARVIS ADAMS, have hereunto set my hand.

STEPHEN JARVIS ADAMS.

Witnesses:

JAMES I. KAY,
J. N. COOKE.