

(No Model.)

S. J. ADAMS.

PATTERN FOR GATES AND RUNNERS IN SAND MOLDS.

No. 455,146.

Patented June 30, 1891.

Fig. 1.

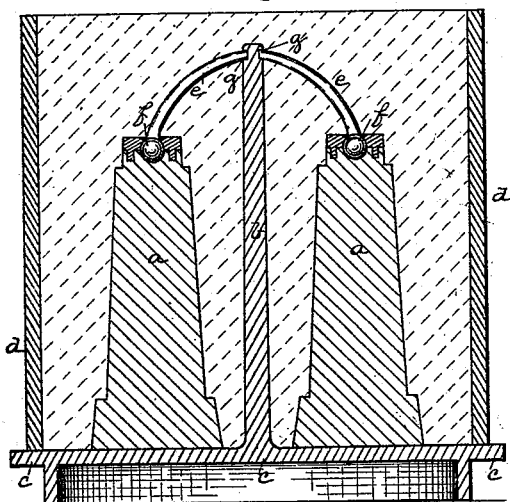


Fig. 2.

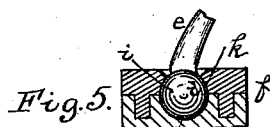
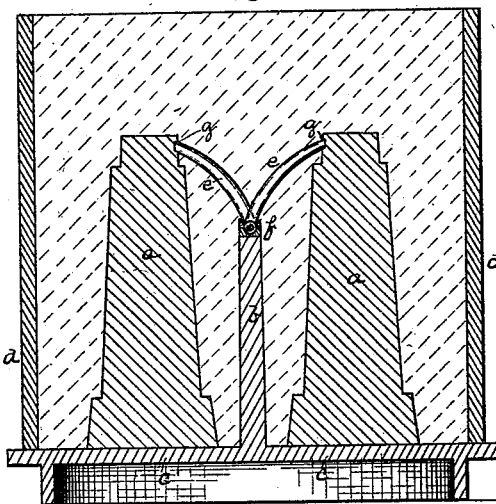


Fig. 3.

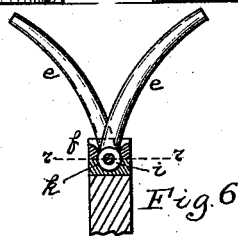
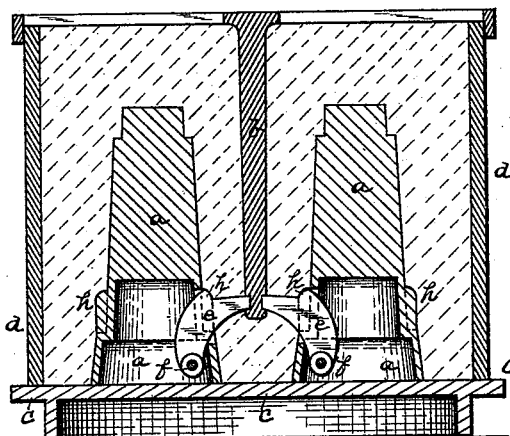
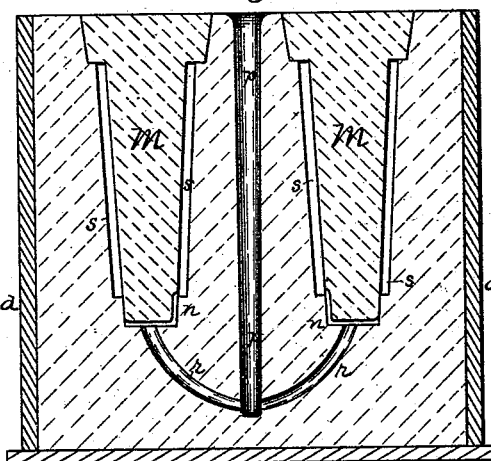


Fig. 4.



Witnesses:

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PATTERN FOR GATES AND RUNNERS IN SAND MOLDS.

SPECIFICATION forming part of Letters Patent No. 455,146, dated June 30, 1891.

Application filed March 2, 1891. Serial No. 383,371. (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 Formation of Gates and Runners in Sand Molds; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to patterns for forming tubular castings, its object being to provide such patterns or molding apparatus by which, while the runner is formed from the gate to the mold-cavity, such runner will be formed without requiring any attention from the molder after the mold is formed, the sand being packed around the runner-pattern in the ordinary molding operation and the runner-pattern being withdrawn with the gate-pattern or mold-pattern, so leaving the proper connection formed between the gate and mold.

To this end my invention consists, generally stated, in the combination, in patterns for forming castings, of two patterns, which are well illustrated in a main pattern and a gate-pattern, and a runner-pattern hinged to one pattern and extending to the other pattern, and adapted to swing on its hinge or bearing and be withdrawn with the pattern to which it is connected, it being only necessary in forming molds by such molding apparatus to arrange the runner-pattern between the two patterns when the patterns are inserted within the flask, the sand being then packed around the patterns, and when they are withdrawn from the finished mold the runner-pattern swinging away from the pattern to which it is not connected and drawing out of the mold with the pattern with which it is connected, leaving the finished runner connecting the gate and mold-cavity or two mold-cavities.

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 a sectional view illustrating one form in which my invention can be employed. Figs. 2 and 3 are like views illustrating other forms embodying my invention. Fig. 4 is a view of a mold ready for casting formed by the apparatus of Fig. 1; and Figs. 5, 6, and 7 are detail views of the preferred forms of

hinge or joint between the runner-pattern and the pattern to which it is connected.

Like letters of reference indicate like parts in each figure.

It is of course preferred to employ my invention in forming molds in which there are several mold-cavities connected by separate runners to the gate, and I have illustrated my invention in connection with that form of molding apparatus, though it is evident that it can employed to advantage in forming runners between any two mold-cavities.

In Fig. 1 the main patterns *a* and the gate-pattern *b* are connected to the pattern-plate *c* and extend up within the flask *d*, while the runner-patterns *e* extend from the main patterns to the gate-patterns, the runner-patterns being connected to the top of each main pattern by a hinge-joint, as at *f*. Each runner-pattern is preferably curved, as illustrated in Figs. 1 and 2, as it will be withdrawn more easily; but it should not be of greater curvature than will permit it to pass through the cavity made by the main pattern without bearing against the walls thereof, and the free end of the runner-pattern is preferably seated in a seat *g*, formed at the upper end of the gate-pattern *b*, as shown. The runner-patterns may in some cases be straight. In Fig. 2 practically the same construction is shown, except that the runner-patterns *e* are hinged to the gate-pattern *b* and extend over to the main patterns *a*, such construction, of course, practically requiring that there shall be but two molds formed within the flask. The free ends of the runner-patterns are seated in the main patterns, as at *g*.

In Fig. 3 is shown another form embodying my invention, in which the gate-pattern *b* extends down from the top of the flask, while the main patterns extend up within the flask and the runner-patterns *e* are hinged at the lower end of the main patterns and swing in toward the lower end of the gate-pattern, bearing against the same or entering seats therein, as shown. This last-described molding apparatus is preferably for the formation of wagon-boxes, and the runner-patterns shown are adapted at the same time to form the feathers at the edge of the wagon-box, as shown at *h*.

It will be understood that in whichever form my invention is employed the several runner-

patterns are hinged so as to swing freely away from the pattern against which their free ends bear, and be withdrawn with the pattern, to which they are hinged or connected. I also
 5 prefer to employ as the hinging device what might be termed a "ball-and-socket joint," as more clearly shown in Fig. 5, the lower end of the runner-pattern having formed thereon a ball *i*, which is seated in a socket *k*, of like
 10 form in the pattern to which it is hinged, so that the runner-pattern may have free opportunity to swing, while the entrance of the sand into the socket or seat of the hinge is prevented. When such construction is employed
 15 with the runner-patterns or connected to the gate-pattern, the two patterns may each have a semi-spherical base, so that when placed together the two will form a sphere or ball *i* to be seated in the ball-like socket *k*, and when
 20 the runner-patterns are withdrawn the two arms will swing past each other and into line with the gate-pattern and be withdrawn therewith. Where the runner-patterns are formed as parts of the wings of the pattern, as shown
 25 in Fig. 3, in order to prevent the entrance of sand into the pattern it is only necessary that when said patterns are projected through the patterns, as shown in the drawings, the bodies thereof shall fill the slots or openings in the
 30 pattern through which they pass.

In the use of my invention the operator places the flask over the patterns, so that it rests upon the pattern-plate, and then draws over the free ends of the runner-patterns, so
 35 that they form the connection between the main patterns and the gate-pattern. He then proceeds to form his mold in the ordinary way, it being preferred, of course, to form the same by jarring and the bodies of the runner-patterns being oval in shape, so as to permit
 40 the packing of the sand below them. As soon as the mold is properly compacted, he proceeds to lower the patterns therefrom, either dropping them from the mold or withdrawing them
 45 in any suitable way, and as the patterns are withdrawn from the mold the runner-patterns will of course be drawn out with the patterns to which they are connected, and will by the body of the sand compacted within the mold
 50 be drawn in line with such patterns, so that they will pass into the cavity formed by the main pattern or by the gate-pattern and pass out of the mold therewith, it not being necessary for the operator to pay any attention to

them. I am thus enabled to form the connecting-runner between the two patterns, such as the gate and main pattern, in a simple and automatic way, and when the cores *M* are placed within the molds they will close the lower or smaller ends of the mold-cavities, suitable runners being formed either in the
 55 cores or in the mold-cavities to permit the metal to flow from below the cores *M* along the sides thereof, as at *n*, or through the cores into the mold-cavities, which will be filled by
 60 pouring the metal down through the gate *p*, thence through the runners *r*, formed by the hinge-runner patterns, and thence along the cores into the mold-cavities *s*.

The operation is practically the same in the mold shown in Fig. 3, the only difference being that as the pattern is withdrawn from said
 70 mold the runner-patterns will swing back into the main patterns, so leaving the feather-cavities formed thereby and the runners connecting the gate and mold, and after the main
 75 patterns are withdrawn the gate-pattern can be withdrawn from the other end of the mold.

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

1. In patterns for forming castings, the combination of two patterns and a runner hinged to one pattern and extending to the other pattern and adapted to swing on its hinge and
 80 be withdrawn from the mold with the pattern to which it is connected, substantially as and for the purposes set forth.

2. In patterns for forming castings, the combination of a series of main patterns, a gate-pattern, and a series of runner-patterns hinged
 85 to the main patterns and extending over to the gate-pattern and seated against it, said runner-patterns being adapted to swing on their hinges and be withdrawn from the mold-cavities with the main patterns, substantially
 90 as and for the purposes set forth.

3. In patterns for forming tubular castings, the combination of two patterns and a runner-pattern hinged to one pattern by a ball-and-socket joint and extending to the other
 95 pattern, substantially as and for the purposes 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.