

2 Sheets, Sheet 1.

N^o 55,294.

Patented June 5, 1866.



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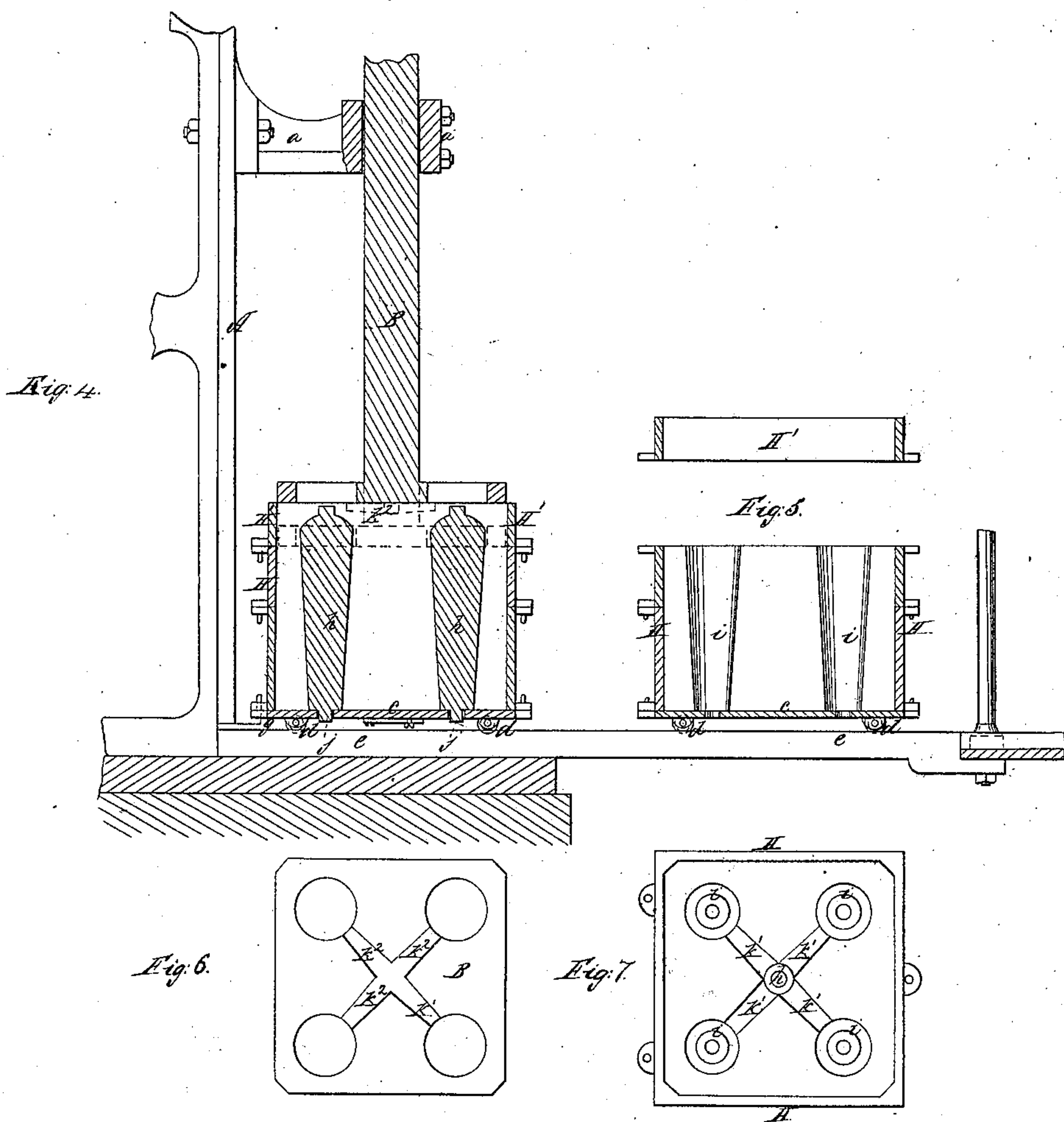
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2 Sheets, Sheet 2.

Molding Apparatus.

N^o 55,294.

Patented June 5, 1866.



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UNITED STATES PATENT OFFICE.

JAMES G. HOLT, OF CHICAGO, ILLINOIS.

IMPROVED METHOD OF MAKING MOLDS FOR CASTINGS.

Specification forming part of Letters Patent No. 55,294, dated June 5, 1866.

To all whom it may concern:

Be it known that I, JAMES G. HOLT, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Method of Making Sand Molds for Castings; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, Sheet 1, is a side elevation of a press which is employed in the operation of making molds. Fig. 2, Sheet 1, is a front elevation of the press. Fig. 3 is a horizontal section through the press, taken just above the follower. Fig. 4, Sheet 2, is a sectional view of the follower and the lower portion of the press-frame, showing the former about to press the sand about the patterns in a flask. Fig. 5, Sheet 2, shows, in section, the flask and molds after the patterns have been removed. Fig. 6, Sheet 2, is a bottom view of the press-follower. Fig. 7, Sheet 2, is a top view of Fig. 5.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to an improved method of making sand molds for castings of various kinds, but more particularly for casting axle-skeins and the boxes of wheel-hubs.

Under the method hitherto adopted of making sand molds for castings the sand is put into the flasks in small quantities at a time and rammed or tamped about the pattern or patterns in layers, each layer being well tamped before more sand is introduced into the flask. This method is necessarily slow and involves the expenditure of much manual labor, particularly when the patterns are long and the flasks very deep.

It is the object of my invention to facilitate the operation of making sand molds by applying steady pressure upon the sand instead of percussion or the repeated blows of a rammer, employing for this purpose a suitable press, which has a follower that is so constructed as to serve as an upper guide for keeping the patterns in place in the flask during the descent of this follower, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In order to give one practical mode of carrying out my invention, I will describe one form

of press which may be used for compacting the sand in the flasks.

This press consists of an upright frame, A, which is secured firmly down to a base, A', and provided with two brackets, *a a*, projecting from its front side. In these brackets *a a* a rod, B, is caused to slide up and down, which rod carries on its lower end a follower, B', which may be made rectangular or circular, according to the size and shape of the flasks into which this follower is caused to descend.

It may be found desirable to apply said follower to its rod B, so that it can be detached therefrom and another of a different size or shape substituted. This follower B' and its rod B are moved up and down vertically by means of a pitman-rod, C, which is connected at its lower end to the rod B by means of a clamp-screw, *a'*, which passes through an oblong slot, *a''*, that is made through the follower-rod, as shown in Fig. 2, Sheet 1. The upper end of the pitman-rod C is pivoted to a wrist-pin, *b*, which pin is formed on a dovetail slide, *b'*, that is held in place in a diametrical slot, *b''*, made in the face of a spur-wheel, D, (shown in Figs. 1 and 2.) The upper end of said pitman-rod is kept in place upon its wrist-pin *b* by means of a nut, *b'''*, which, when loosened, will allow the wrist-pin to be adjusted nearer to or farther from the axis of the wheel D. In this way the length of stroke of the follower and its rod may be increased or diminished. The follower and its rod may be caused to descend more or less without shortening or lengthening its strokes by loosening the clamp-screw *a'* and adjusting the follower-rod, after which said screw is tightened again.

The spur-wheel D engages with the teeth of a pinion-wheel, D', on a shaft, D², which carries on its opposite end a large spur-wheel, E. This wheel E engages with a pinion-wheel, E', on the driving-shaft F, which shaft may be driven by means of a belt passing over a fixed drum, G, and receiving motion from any convenient prime motor. Alongside of the drum G is a drum, G', (shown in Fig. 1,) which is loose upon its shaft F, and upon which the driving-belt can be shipped at pleasure when it is desired to stop the movements of the follower.

The mold boxes or flasks should be made very strong to resist the pressure to which they are subjected. These flasks may be made

of metal, as represented in the drawings, Figs. 4, 5, and 7. The flask H (shown in these figures) is of a rectangular form, and is provided with a movable bottom plate, *c*, having rollers or wheels *d d* on its bottom surface, which rollers facilitate the movement of the flasks from one place to another.

The flasks are moved up to and from the press upon rails *e e*, the wheels or rollers *d d* on the bottoms of the flasks being grooved or flanged so as to fit said rails. The stops *g*, near the press-frame, are intended for checking the flasks in the proper position beneath the press for receiving the follower B' within them. These stops may be made adjustable for adapting them to flasks of different sizes or shapes.

The flask H which I have represented in the drawings is adapted for receiving four tapering patterns, *h h*, for making four molds, *i i i i*, (shown in Figs. 5 and 7.) These molds may be made in the following manner: The four patterns *h* are placed in the flask H, and steadied at bottom by pins *j j*, projecting from them and entering correspondingly-sized holes which are made through the bottom plate, *c*, of the flask, as shown in Fig. 4, Sheet 2. The patterns being thus adjusted in place, a sprue-rod is then inserted in a hole in the center of the plate *c*, which rod extends nearly to the top of the flask.

The upper ends of the patterns and sprue-rod may be held in place temporarily by cross-bars, which I have not shown in the drawings. The coping or shallow flask-section H' is then placed on top of the flask and properly secured in place by clamps or dowel-pins, and the flask and coping are filled with sand and moved beneath the follower B', as represented in Fig. 4. The capacity of the coping H' or the quantity of sand which is put into this coping will depend upon the power of the press to force this overplus of sand down to a level with the top edge of the flask H, as shown in Fig. 5. The larger the quantity of sand put in the coping H' the greater will be the pressure required to make the molds, and the more compact will the sand be made in the flask.

Before commencing the operation of pressing the sand about the patterns the follower-rod B should be so adjusted with reference to the flasks used that the bottom of the follower B' will be in a plane or on a level with the top edge of the flask H when this follower completes its descending stroke. This will leave the top surface of the sand on a level with the top of the flask, as shown in Fig. 5.

The follower B' is perforated, as shown in Figs. 3, 4, and 6, for the purpose of allowing the upper ends of the patterns *h h* to enter said holes as the follower descends into the coping H'. Thus the follower serves as a guide for the patterns, and prevents the displacement of their upper ends during the compressing of the sand about them.

There being four molds in the same flask for making four castings at the same time, I connect these molds with the central sprue-hole, K, (shown in Fig. 7,) by branch sprue-holes K', which are produced by the projections K² on the bottom of the follower B', as shown in Fig. 6.

When one set of molds has been made the coping H', the patterns, and the sprue-rod are removed, and the molds moved off upon the rail-track to be further treated, as will be described in another application for a patent which will be made contemporaneously with this. For some purposes the molds made as above described will be ready for use without further treatment; but for some kinds of castings it may be found desirable to employ rotating or moving tools for sleeking the surfaces of the sand molds.

I do not confine my invention to the use of the press herein described, as presses of different kinds may be employed for packing the sand about the pattern or patterns in the flask.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The devices, arranged and combined substantially as herein described, for regulating the descent of the plunger B with respect to height of the flasks in which the molds are made, for the purpose set forth.
2. The combination of the projections K² with the follower of the press for forming the branch sprue-holes K', substantially as described.
3. The combination of the press and its follower with the coping H' and flask H, all constructed as described, in the manner shown, so that molds for axle skeins and boxes may be pressed, substantially as set forth.
4. The perforated follower B', in combination with the sectional flask H H' and patterns *h h*, for the purpose substantially as described.

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Witnesses:

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