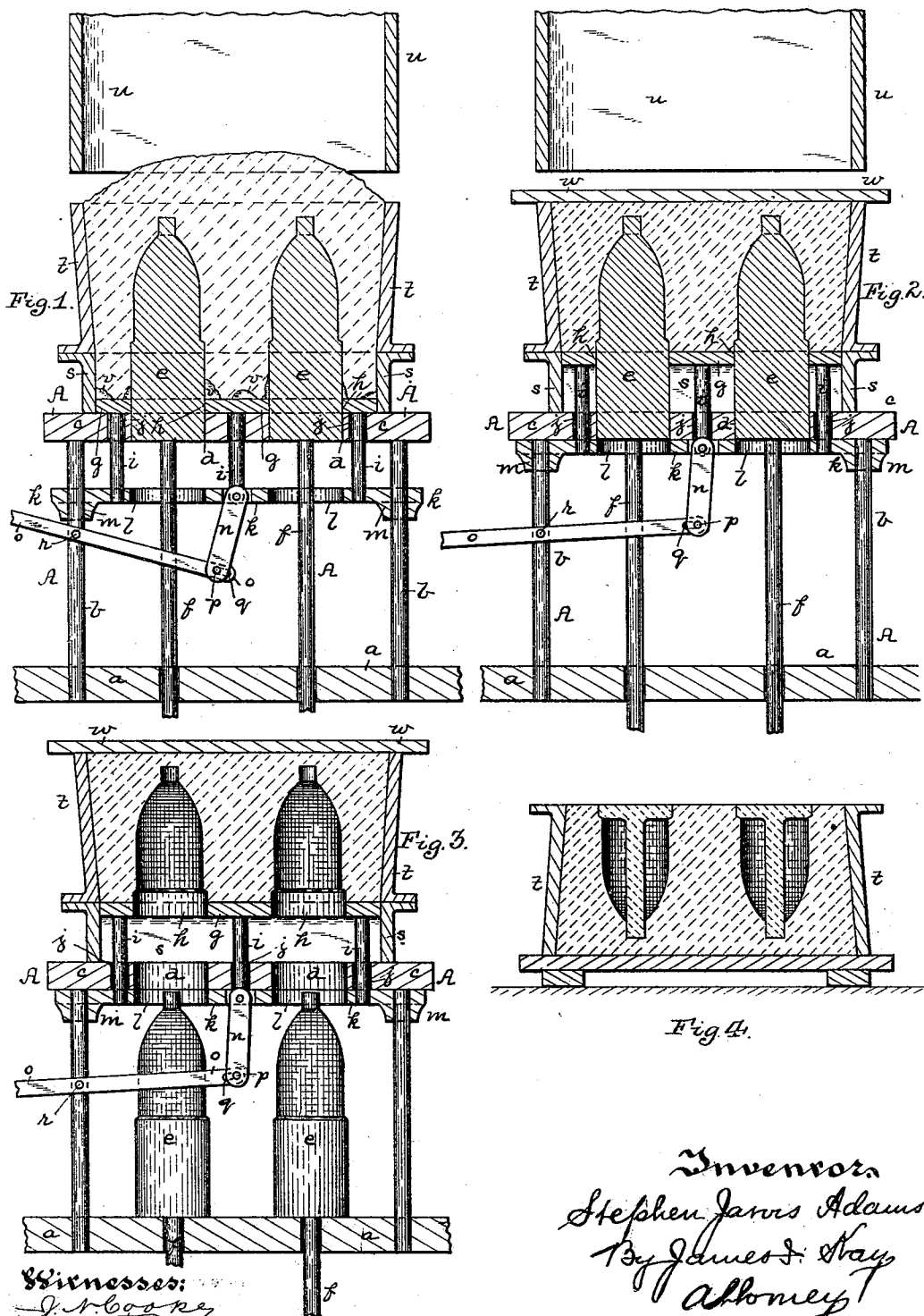


(No Model.)

S. J. ADAMS.
METHOD OF FORMING SAND MOLDS.

No. 544,423.

Patented Aug. 13, 1895.



Witnesses:
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UNITED STATES PATENT OFFICE.

STEPHEN JARVIS ADAMS, OF PITTSBURG, PENNSYLVANIA.

METHOD OF FORMING SAND MOLDS.

SPECIFICATION forming part of Letters Patent No. 544,423, dated August 13, 1895.

Application filed November 23, 1891. Serial No. 412,858. (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 Methods of Forming Sand Molds; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to sand-molding apparatus, its object being to provide a form of apparatus for compacting the sand closely around the base of the pattern in such a manner as to avoid spongy parts and all liability of pockets or air-cavities in the finished mold. Where sand molds are formed by allowing the sand to descend by the force of its own gravity from a point elevated above the flask which contains the patterns, or where the sand is forced into the flask by the employment of artificial means, in either case spongy parts, pockets, or air-cavities are liable to be formed around the bases of the patterns, due to the air confined within the flask.

It is the object of my invention to free the sand molds so formed from such pockets and air-cavities in the manner hereinafter set forth.

My invention consists, generally stated, in forming sand molds or cores by first feeding the sand in bulk by dropping, or similar means, to the flask, and then forcing the sand upwardly in the base of the flask to compact the mold and close any such pockets or air-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 side view, partly in section, of my improved apparatus. Fig. 2 is a like view showing the presser in its raised position. Fig. 3 is a view showing the patterns removed, and Fig. 4 shows the flask inverted with the completed molds therein.

Like letters indicate like parts in each figure.

The molding-table A is supported on the floor or platform a, and said molding-table is composed of the standards b and the top plate c, supported thereon. The top plate c of said table A is furnished with the openings d, through which the patterns e may be inserted

or withdrawn, as will more fully hereinafter appear. The patterns e are provided with rods f, which act as handles for convenience in the insertion and withdrawal of said patterns. Above the top plate c of the table A is the presser-plate g, adapted in its normal position to rest upon said top plate c. The presser-plate g is likewise furnished with openings h, which, when said plate is in position, coincide with the openings d in the top plate c. Vertical rods i are secured to the presser-plate g, and said rods pass down through openings j in the top plate c of the table A. The lower ends of the vertical rods i are secured to a guide-plate k, so that any upward movement imparted to the said guide-plate k will act to elevate the presser-plate g uniformly at all points of its pressing-face. The guide-plate k is provided with openings l, which are adapted to coincide with the openings d and h in the top plate c and presser-plate g, respectively. The guides m on the guide-plate k engage with the standards b of the table A and move up and down thereon. In order to raise and lower the guide-plate k and with it the presser-plate g, a link n is pivoted at or near the center of the guide-plate k, the lower end of said link being secured to the end of the lever o by means of a pin p, which engages with a slot q in said lever o. This form of connection between the link n and lever o provides for the requisite amount of play on the part of said link in the raising and lowering of the guide-plate. The lever o is fulcrumed at r to the standard b, and said lever may be operated by foot or hand power, as may be found most convenient. Any other suitable form of mechanism for raising and lowering said guide-plate may, however, be employed. A supplemental or auxiliary flask or reservoir s rests upon the top plate c of the table A, within which the presser-plate g is adapted to fit snugly. The main flask t is supported on the supplemental flask s, the walls of the former coinciding with and resting upon the walls of the latter. A chute u or any other suitable feeding device may be arranged above the main flask t, by which the sand may be fed in bulk to said flask, such device illustrating any mechanism in or by which a large bulk of sand sufficient to form the entire mold is delivered to the

flask at a velocity and with force sufficient to pack the sand therein.

I have illustrated and described my invention in connection with its use as applied to the formation of molds for pipe-balls, but its use may be extended to the formation of any molds or cores to which it may be found applicable.

The operation of my improved molding apparatus is as follows: When the several parts of the apparatus have been arranged, as shown in Fig. 1, with the patterns *e* properly supported within the flasks and the presser-plate *g* resting upon the top plate *c* of the table *A*, the apparatus is then ready for the molding operation. The sand is then fed in bulk to the flask *t*, the large body of sand entering the flask at a velocity and with force sufficient to pack, and as the body of sand extends entirely over the flask escape of any great portion of air through the mouth of the flask is prevented, so that some air is necessarily confined within the flask. The sand also descends into the supplemental flask *s*, where it finally rests upon the presser-plate *g*. Upon the descent of the sand in bulk, as above described, this confined air consequently acts as a cushion for the descending sand. The result of this action is that spongy air channels and pockets or air-cavities *v* are formed at or near the lower ends of the patterns *e*, as shown in Fig. 1. When the flask has been properly filled with sand, a cover-plate *w* is placed on the flask and confined thereon or it is of sufficient weight to resist the pressure brought to bear on the body of sand from below, as will more fully appear. The outer end of the lever *o* is then depressed by foot or hand power, which operation, through the connections described, will elevate the guide-plate *k*. Since the guide-plate *k* is connected to the presser-plate *g* by the vertical rods *i*, any vertical movement imparted to the said guide-plate *k* will

impart a like movement to the presser-plate *g*. The action of the presser-plate *g* as it ascends will be to compress the body of sand deposited around the lower ends of the patterns *e* and compact it in such manner as to close or destroy any pockets or cavities which may have been formed upon the descent of the sand. It will be noticed that the patterns *e* are made of a greater length than the molds to be formed, thereby to allow for this compacting of the sand up around the line which marks the commencement of the mold proper. To this end the presser-plate *g* reaches its highest point of elevation when it arrives at the line of juncture between the flask *t* and the supplemental flask *s*, as shown in Fig. 2. The sand is thus uniformly packed within the flask. The cover-plate *w* acting to resist the pressure from below insures the density of the sand.

Fig. 3 of the drawings illustrates the manner of withdrawing the patterns after the sand has been compacted, and Fig. 4 illustrates the flask *t*, inverted ready for the introduction of the cores preparatory to the casting operation.

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

The herein-described method of forming sand molds, consisting in feeding sand to the flask in bulk and at sufficient velocity to practically finish the packing of the upper part of the mold, and then compressing the sand in the flask by pressure operating in the opposite direction to that in which the sand enters the flask, to complete the mold, 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.