(No Model.) 2 Sheets—Sheet 1.

A. B. KILPATRICK.

SAND MOLDING MACHINE.

No. 564,891. Patented July 28, 1896.

Fig. I.

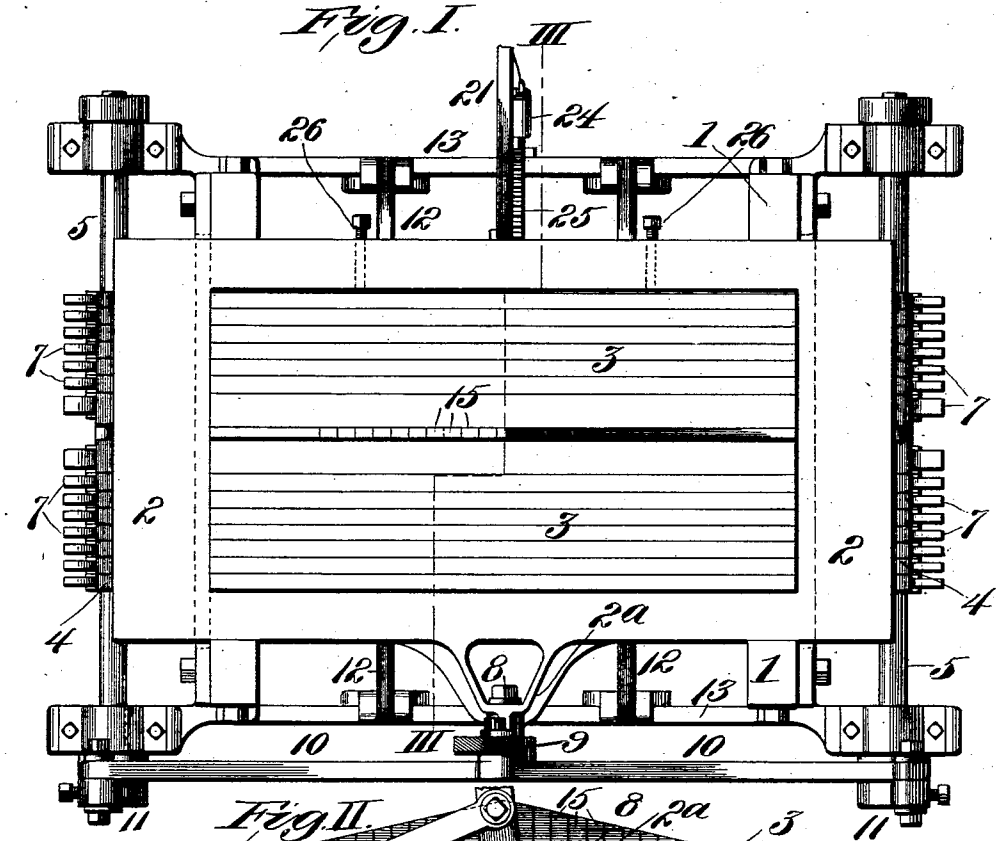
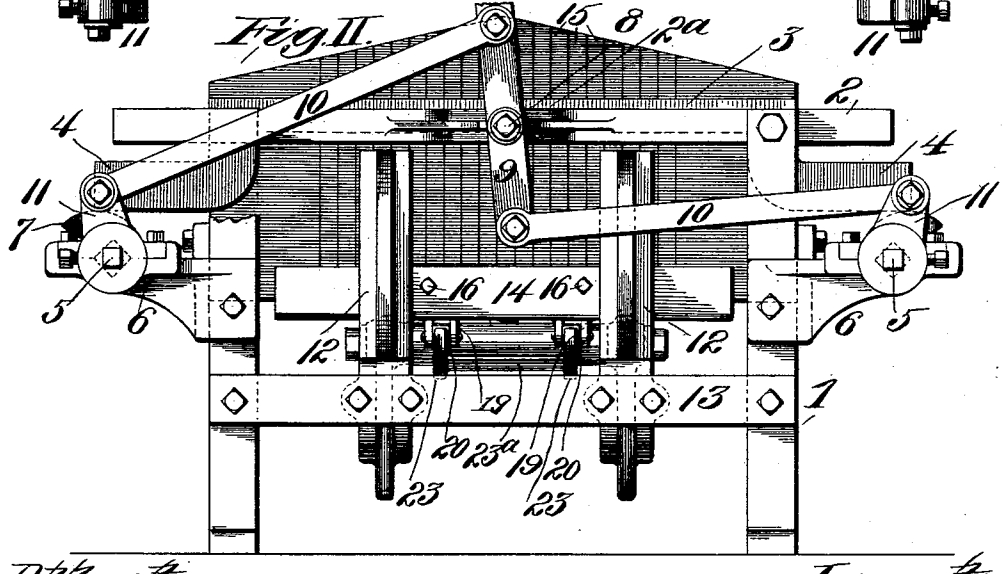


Fig. II.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. III.

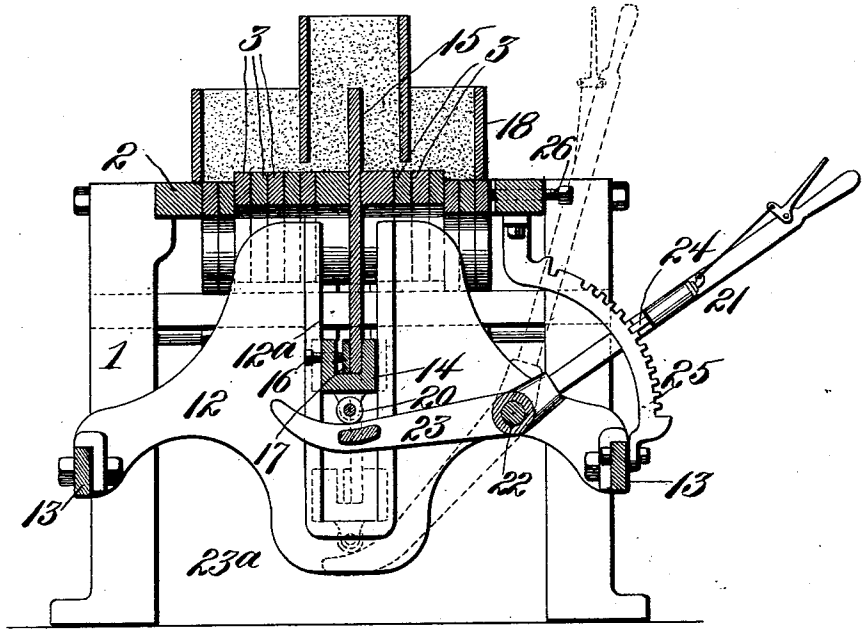
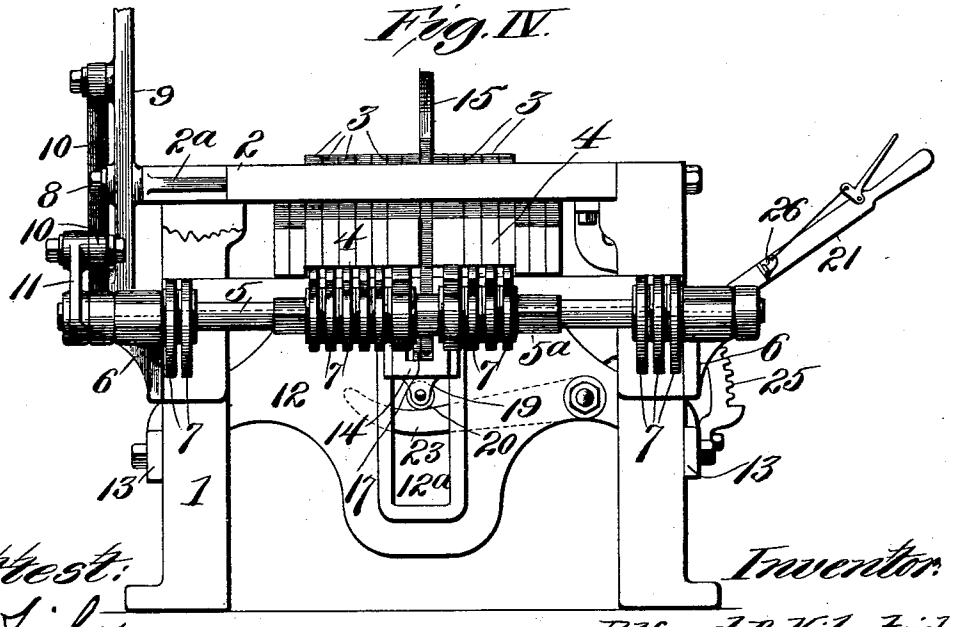


Fig. IV.



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UNITED STATES PATENT OFFICE.

ALFRED B. KILPATRICK, OF ST. LOUIS, MISSOURI.

SAND-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 564,891, dated July 28, 1896.

Application filed December 2, 1895. Serial No. 570,749. (No model.)

To all whom it may concern:

Be it known that I, ALFRED B. KILPATRICK, of the city of St. Louis, State of Missouri, have invented a certain new and useful Improvement in Sand-Molding Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to a sand-molding machine having a bed composed of sections that may be projected upward into an ordinary molding-flask seated on the bed or the table surrounding the bed, and by means of which sectional bed arrangement I am enabled to produce varied forms of impressions in the sand contained in the flask without the employment of a separate pattern for each different form of impression of article to be cast, thus avoiding the expense of patterns and materially lessening the amount of labor and time involved in preparing the flask for the receipt of the metal.

My invention consists in features of novelty hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure I is a top view or plan of my machine. Fig. II is a side elevation. Fig. III illustrates a vertical section taken on line III III, Fig. I. Fig. IV is an end view.

In the drawings, 1 designates the frame of the machine on which the table 2 is supported. This table is rectangular in form and is provided with an open central portion in which the movable mold-forming sections are located and operate. The mold-forming sections are in form of plates 3, provided at each end with an extension 4.

5 designates shafts mounted in journal-boxes 6, supported on the frame 1 at each end of the machine. These shafts are of circular form adjacent to the boxes 6, and their central portions 5^a are of non-circular form, and each shaft carries separate cams 7 of a number corresponding to the number of plates 3 in the machine. Each of the cams has a non-circular opening of a size corresponding to the portion 5^a of the shaft 5, whereby when the cams are on the portion 5^a they will be caused to turn with the shaft and be thrown in contact with the extensions 4 of the plates 3 and impart movement to the plates, while they are capable of being removed to the circular portions of the shafts, where they will be idle, and the plates corresponding to them will not be operated. In Fig. IV a part of the cams is shown located on the portion 5^a of the shaft, and the remainder are shown removed to the circular parts of the shaft.

Formed on the table 2 is a bracket 2^a, and mounted in this bracket is a pin 8, to which a lever 9 is fulcrumed. Above and below the fulcrum of the lever 9 are pivoted the inner ends of links 10, whose outer ends are pivoted to cranks 11 on the ends of the shafts 5, and through means of the lever 9 motion is imparted to the links 10 to rock the shafts 5, in which motion of the shafts the cams 7 are moved and, bearing against the extensions 4 of the plates 3, operate the corresponding-positioned plates.

12 designates cross-plates, supported on bars 13, secured to the frame 1 of the machine, intermediate of the ends of the machine. These cross-plates are provided with vertical slots 12^a at their central portions, in which slots a U-shaped bar 14 is adapted to travel. The U-shaped bar 14 is designed to receive a number of sections 15, that produce a rib-impression plate which is located in the central portion of the sectional bed of the machine, and the sections 15 being clamped in the bar 14 by means of set-screws 16, that bear against a bar 17. On the loosening of the set-screws the sections 15, or any portion of them, may be removed to suit the character of the casting for which the mold is to be prepared. This machine is more especially adapted for use in preparing molds for lintel and sill plates, and in such plates it is frequently desired to change the length and position of a rib formed on the lintel-plate, and hence the object in making the rib-forming plate in sections, as just described.

18 designates a flask, which may be of any ordinary form.

On the under side of the U-shaped bar 14 are brackets 19, in which rollers 20 are mounted.

21 designates a lever mounted on a shaft 22 and carrying a fork 23, the arms of which are connected by a cross-bar 23^a and which bear against the rollers 20, and through means of

which the rollers are supported. The lever 21 is held in any desired position by means of a trip-dog 24 carried by it, and which engages with a rack-bar 25, secured to the body of the machine.

26 are set-screws in the table, by which the plates 3 may be clamped together.

In preparing a flask for molding the operation is as follows: The flask is placed upon the table or the sectional bed of the machine, and, according to the size of the casting to be made, the desired number of plates 3 are predetermined and the corresponding number of cams 7 are moved under the extensions 4 of the plates to be elevated, and the lever 9 is then moved to rock the shaft 5 a sufficient distance that the cams 7 may elevate the plates 3 the required amount into the sand in the flask, and the lever 21 is moved a sufficient distance to project the sections 15 of the rib-forming plate into the sand the desired distance. The set-screws 26 are then turned to clamp the plates 3 together and prevent their downward movement during the process of ramming the sand in the flask. The parts at this time will be in the position in which they are illustrated in Figs. III and IV, and the sand is rammed down in the flask and the mold thus formed. As soon as the sand has been rammed a sufficient amount the plates 3 and sections 15 are all returned to their normal positions through the reverse operation of their actuating mechanism, and the flask may then be removed.

If the opposing half of the flask is to receive an impression, the parts may be actuated in the like manner and the sand rammed down as before; but if the opposing half of the flask is not to receive an impression, the entire bed of the machine is brought on a level and the flask is placed thereon and the sand rammed down, thereby forming a smooth surface on the side of the flask that opposes the half in which the impression has been made.

I claim as my invention—

1. In a sand-molding machine, the combination of a frame, a sectional bed supported on said frame, said bed being composed of straight plates arranged in parallel line, and mechanism arranged to move said plates in series, substantially as and for the purpose set forth.

2. In a sand-molding machine, the combination of a frame, a sectional bed supported on said frame, said bed being composed of straight plates arranged in parallel line, mechanism arranged to elevate said plates in series, and a means for clamping said plates in position, substantially as and for the purpose set forth.

3. In a sand-molding machine, the combination of a frame, a sectional bed supported on said frame, said bed being composed of straight plates arranged in parallel line, mechanism arranged to elevate said plates in series, and a rib-forming plate located in the sectional bed and operated by a separate means from the mechanism by which the aforesaid plates are operated, said rib-forming plate being composed of sections, substantially as and for the purpose set forth.

4. In a sand-molding machine, the combination of a frame, a sectional bed supported on said frame, said bed being composed of plates arranged in parallel line, mechanism for elevating said plates, said mechanism consisting of shafts having central non-circular portions, and outer circular portions, means for operating said shafts, and cams loosely mounted on the non-circular portions of said shafts, said cams being provided with non-circular bores, substantially as and for the purpose set forth.

5. In a sand-molding machine, the combination of a frame, a sectional bed supported on said frame, said bed being composed of straight plates arranged in parallel line, mechanism arranged to elevate said plates in series, a rib-impression plate located in the sectional bed, a bar in which said last-mentioned plate is carried, and a lever arranged to operate said bar, substantially as and for the purpose set forth.

ALFRED B. KILPATRICK.

In presence of—
E. S. KNIGHT,
W. FINLEY.