

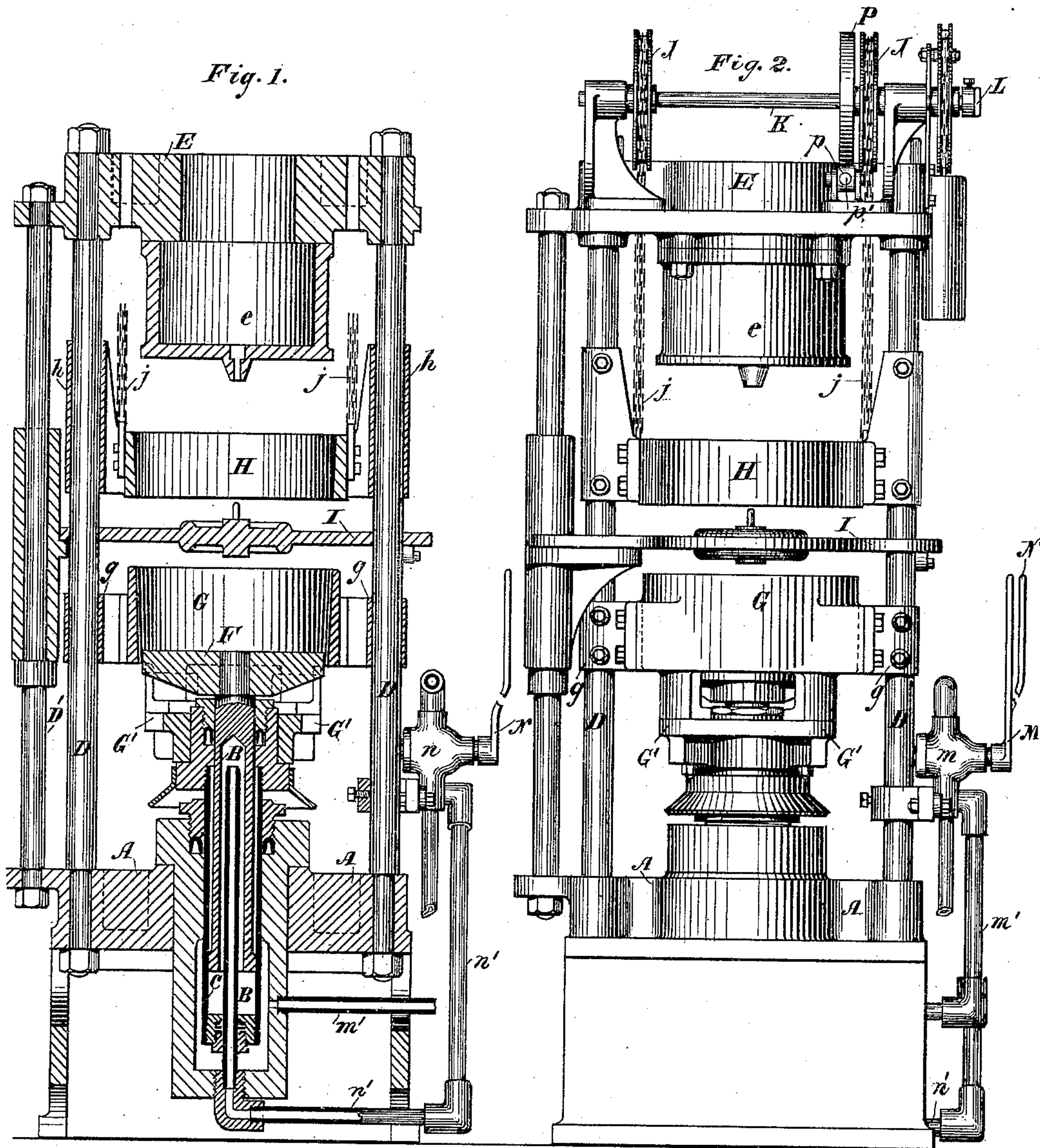
(No Model.)

2 Sheets—Sheet 1.

F. G. LEEDER.
SAND MOLDING MACHINE.

No. 409,471.

Patented Aug. 20, 1889.



Witnesses:
Advers:
C. L. Richards

Inventor:
Frederick George Leeder.
By *Richardson*
Attorneys.

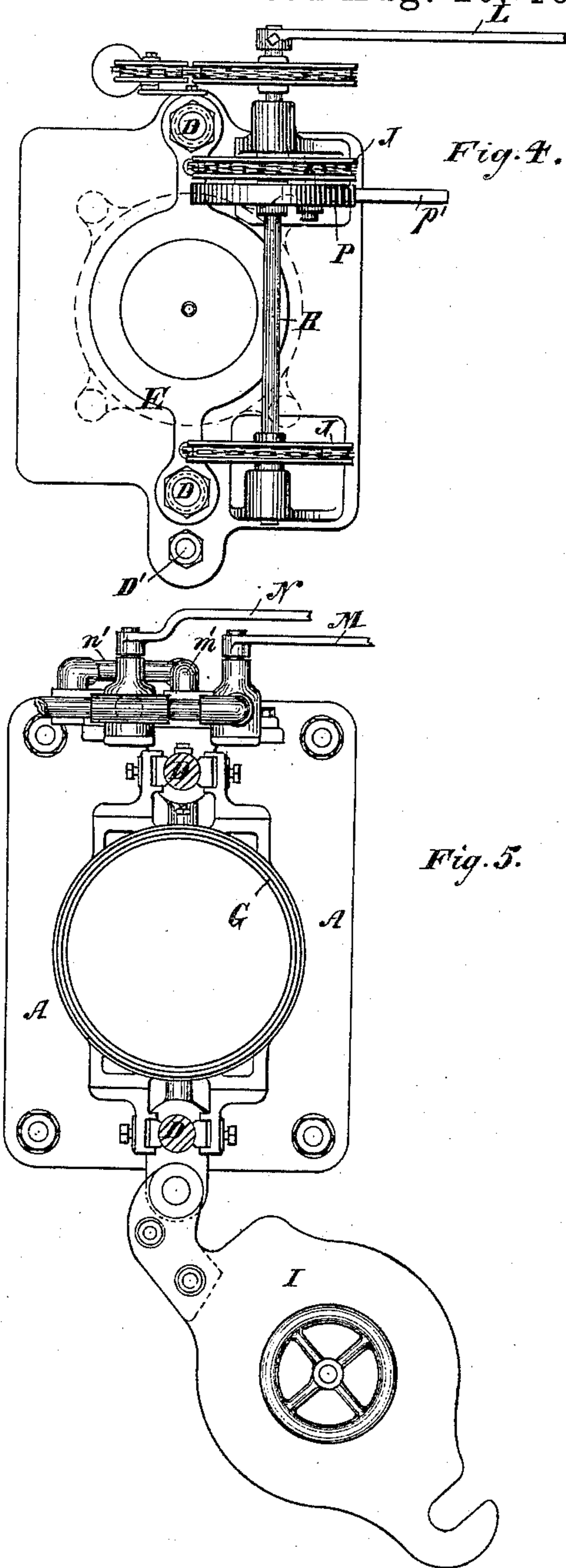
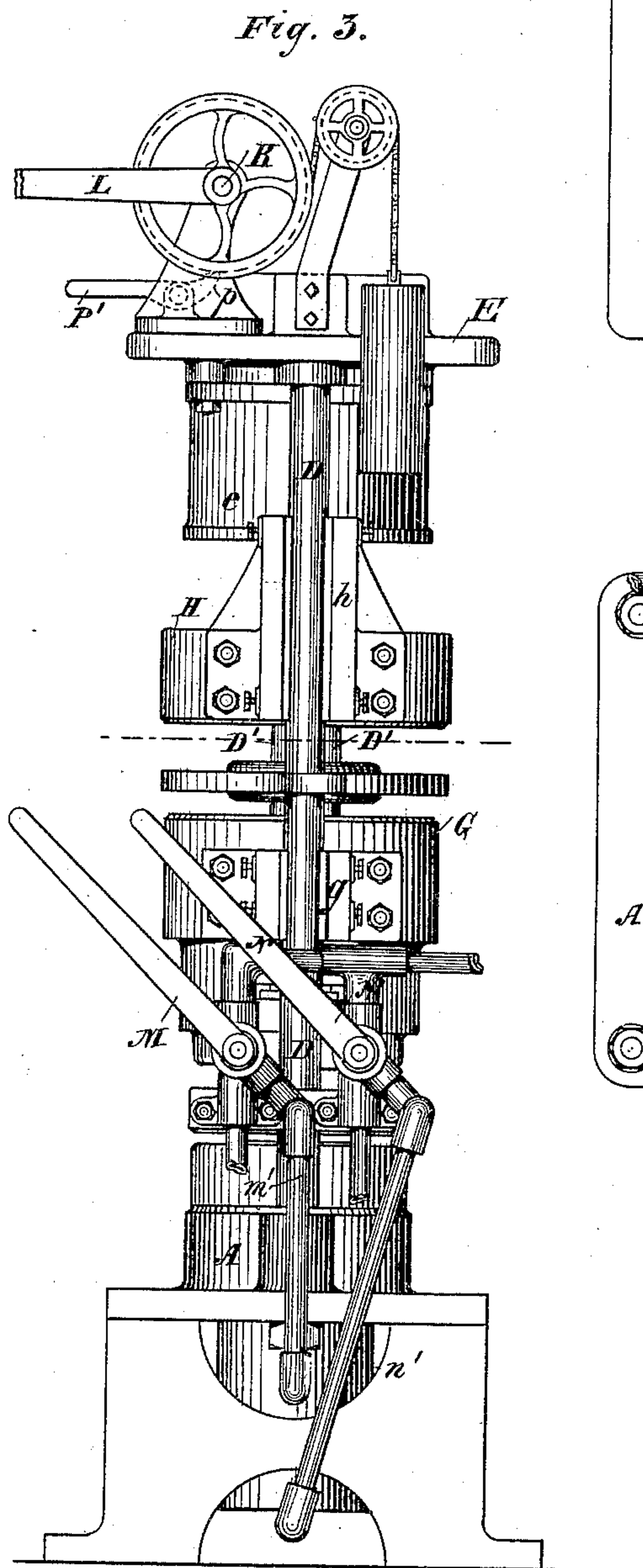
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UNITED STATES PATENT OFFICE.

FREDERICK G. LEEDER, OF DALMUIR, COUNTY OF DUMBARTON, SCOTLAND.

SAND-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 409,471, dated August 20, 1889.

Application filed April 19, 1889. Serial No. 307,849. (No model.) Patented in England August 7, 1888, No. 11,368.

To all whom it may concern:

Be it known that I, FREDERICK GEORGE LEEDER, residing at Dalmuir, county of Dumbarton, Scotland, have invented a new and useful Improvement in Sand-Molding Machines, which has not been patented in any country, except Great Britain by Letters Patent dated August 7, 1888, No. 11,368; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the manufacture or art to which it relates to make and use the same.

This invention relates to machines for making sand molds for casting; and it has for its object to economize time and labor in making the molds, while enabling molds of simple kind to be produced in a complete form in a single machine, instead of, as heretofore, being composed of parts made in separate machines or at separate operations in the same machine.

In the improved machine the pattern is formed or fitted in part upon the upper side and in part upon the lower side of a pattern-plate which constitutes a parting-plate, and the mold is formed in sand contained in two "flasks" or mold-boxes placed one over and the other under the pattern-plate, the sand being pressed within the mold-boxes by the action of hydraulic rams, which also serve upon the removal of the pattern-plate to eject the sand molds from the mold-boxes.

In the accompanying drawings, Figure 1 is a vertical section of the machine. Fig. 2 is a front elevation; Fig. 3, an end elevation; Fig. 4, a plan, and Fig. 5 a horizontal section at the line *xx* in Fig. 3.

As represented in the drawings, the improved machine comprises a framing composed of a base-piece A, carrying two hydraulic rams B and C, two or more vertical guide rods or pillars D D, and an entablature or top plate E, connected to the pillars D and serving to resist the pressure of the rams when pressing the sand. The hydraulic rams (of which there may be one, two, or more pairs, according to the size of the machine) are placed the one B within the other C, the plunger *c* of the outer one C serving as a cylinder for the inner one B. The inner ram

terminates at its upper end in a platen F, and on the outer ram is fitted a head or platen G', on which is fixed the lower flask or mold-box G, to which the platen F serves as a movable bottom plate.

The mold-boxes G and H are provided with guide-brackets *g* and *h*, fitted to slide on the guide rods or pillars D D, and the pattern-plate I, which is situated between the upper and lower box, is centered or pivoted on one of the pillars D, or, as shown, on a separate pillar D', so that it may be swung horizontally out of the way or into position between the mold-boxes for forming the mold. The lower mold-box is filled with sand while the rams B C are down, a loose carrying board or plate being laid on the top of the platen F, and the pattern-plate swung out to the position indicated at Fig. 5, the upper box being lifted out of the way by means of chains *j*, attached to it and passing over pulleys J on a rock-shaft K, provided with a lever-handle L. The pattern-plate is then swung into the position indicated at Fig. 3, between the boxes, and the upper box lowered onto it and filled with sand. The rams are thereafter raised by operating-lever handles M N, which are fitted to cocks *m n* on pipes *m' n'*, which admit water to the ram-cylinders B C. The mold-boxes G H and pattern-plate I, which is between them, are by this means pressed up against the entablature E, while the platen F underneath, and a central boss *e* in the entablature above, serve to press the sand against the pattern or patterns on both sides of the pattern-plate I. The rams are then dropped by reversing the cocks *m n* by means of the levers M N, the lower mold-box G dropping with the head G' and platen F, while the upper box H is retained by a pawl *p*, engaging a ratchet-wheel P on the rock-shaft K, and the pattern-plate I slips down to a mid-position, as shown in the drawings, in which it is clear of both boxes G and H and may be swung out of the way. The upper box H is then lowered by releasing the pawl *p* by means of a lever *p'*, or the lower box G raised to bring the parts of the mold together, and water admitted by opening the cock N to lift the inner ram B, whereby the platen F presses up and ejects

the sand mold from the boxes G H, which are slightly tapered to facilitate this operation, leaving the complete mold free on the loose board or plate, ready for removal and casting.

5 The rams B C, in lieu of being actuated by water-pressure, may obviously be worked by means of steam, compressed air, or other fluid under pressure.

Having now described the invention, what
10 I desire to secure by Letters Patent is—

1. A sand-molding machine composed of the following elements arranged and operating in combination, as follows: the framing A, carrying hydraulic rams B C, one placed
15 within the other, a head on the ram C, to which is attached a lower mold-box G, and a platen on the ram B, adapted to enter said mold-box, a pattern-plate I, fitted to swing horizontally out or into position between the
20 mold-box G and an upper mold-box H and to slide vertically in guides with said boxes, and a resisting plate or entablature E, adapted to resist the pressure of the rams upon sand compressed within the mold-boxes on both
25 sides of the pattern-plate, substantially as described.

2. In a sand-molding machine, the framing A, carrying hydraulic rams B C, and a pressure-resisting plate E, in conjunction with the
30 flasks or mold-boxes G H, fitted to slide on

guides D D, the box G being carried by the ram C, a pattern-plate I, adapted to be placed between said boxes, and a platen carried by the ram B, substantially as described.

3. In a sand-molding machine, the combination of a pressure-resisting plate, the vertically-guided mold-boxes G H, a pattern-plate free to be swung horizontally out or into position between said boxes and to slide vertically with the mold-boxes, and rams carrying
40 one of said mold-boxes and a compressing-platen, substantially as described.

4. In a sand-molding machine, the arrangement, in combination, of a pressure-resisting plate, the hydraulic rams B C, fitted one
45 within the other, one ram being provided with a platen fitted within a mold-box carried by the other ram and being adapted to eject from the box the sand-mold produced in the machine by the exertion of pressure of both
50 rams, substantially as described.

In witness whereof I have hereunto set my hand and seal this 27th day of February, 1889.

FREDERICK G. LEEDER. [L. s.]

Witnesses:

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