(No Model.) 3 Sheets—Sheet 1.

D. CARLIN.

MOLDING APPARATUS.

No. 444,588. Patented Jan. 13. 1891.

Fig. 1.

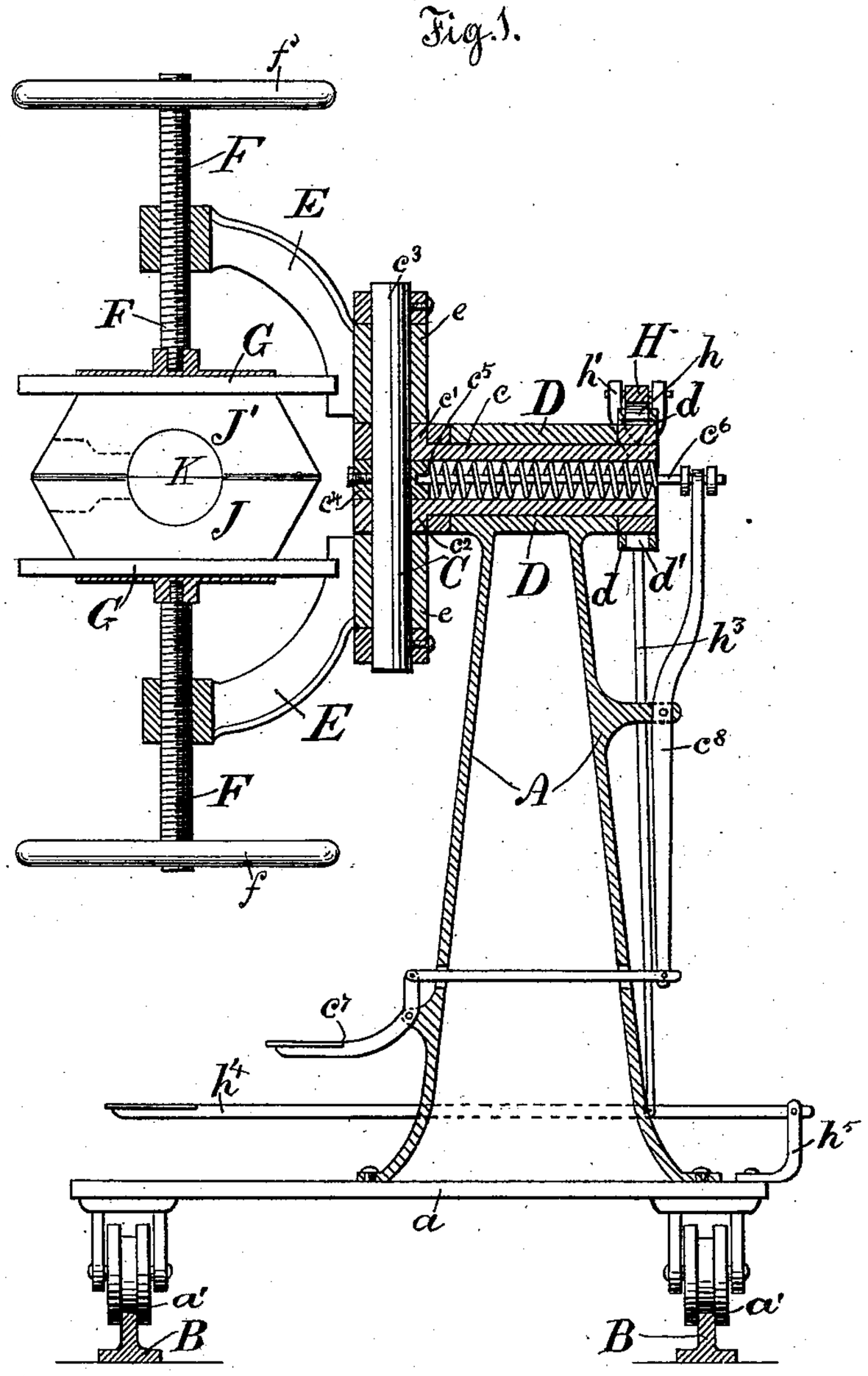


Fig. 3.

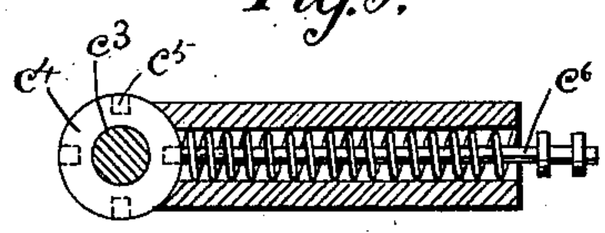
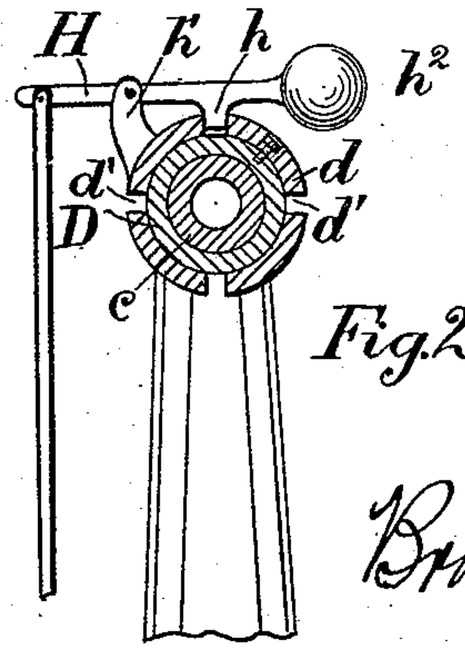


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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MOLDING APPARATUS.

No. 444,588. Patented Jan. 13, 1891.

Fig. 3.

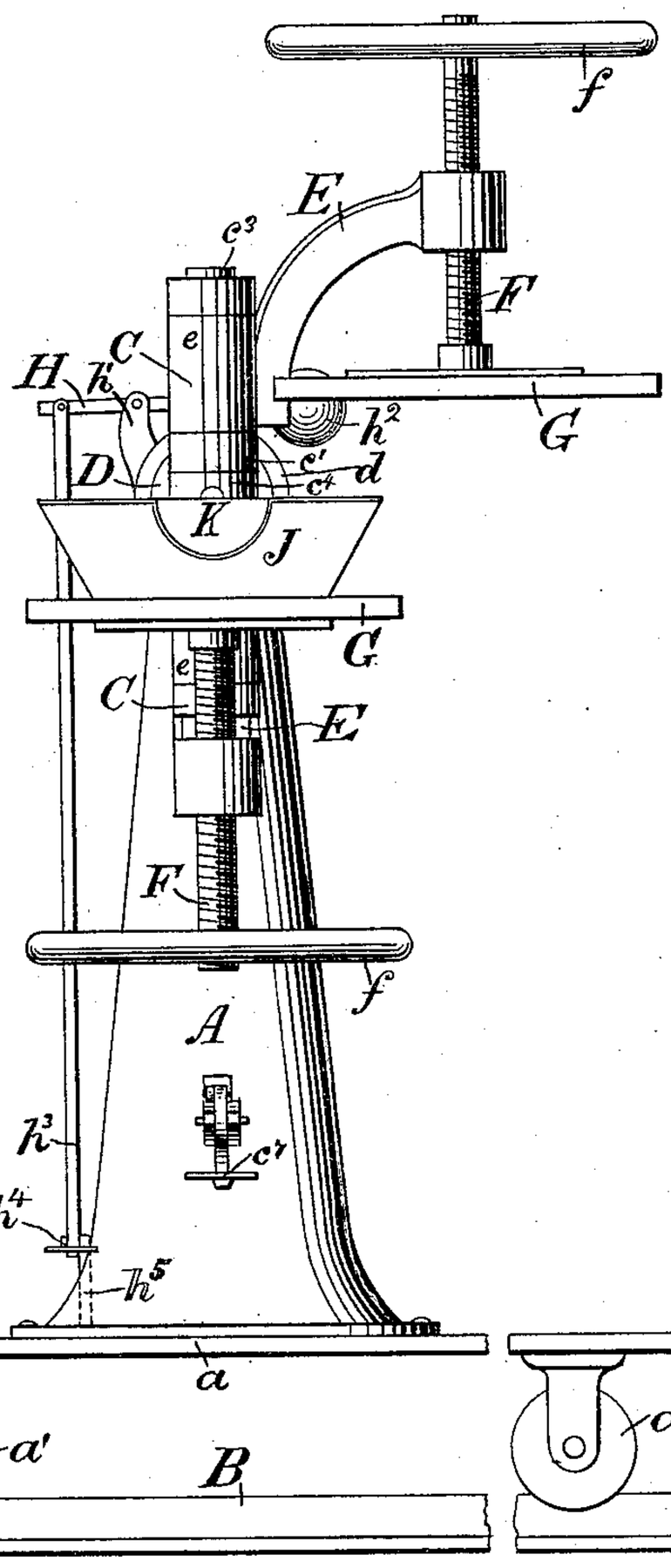
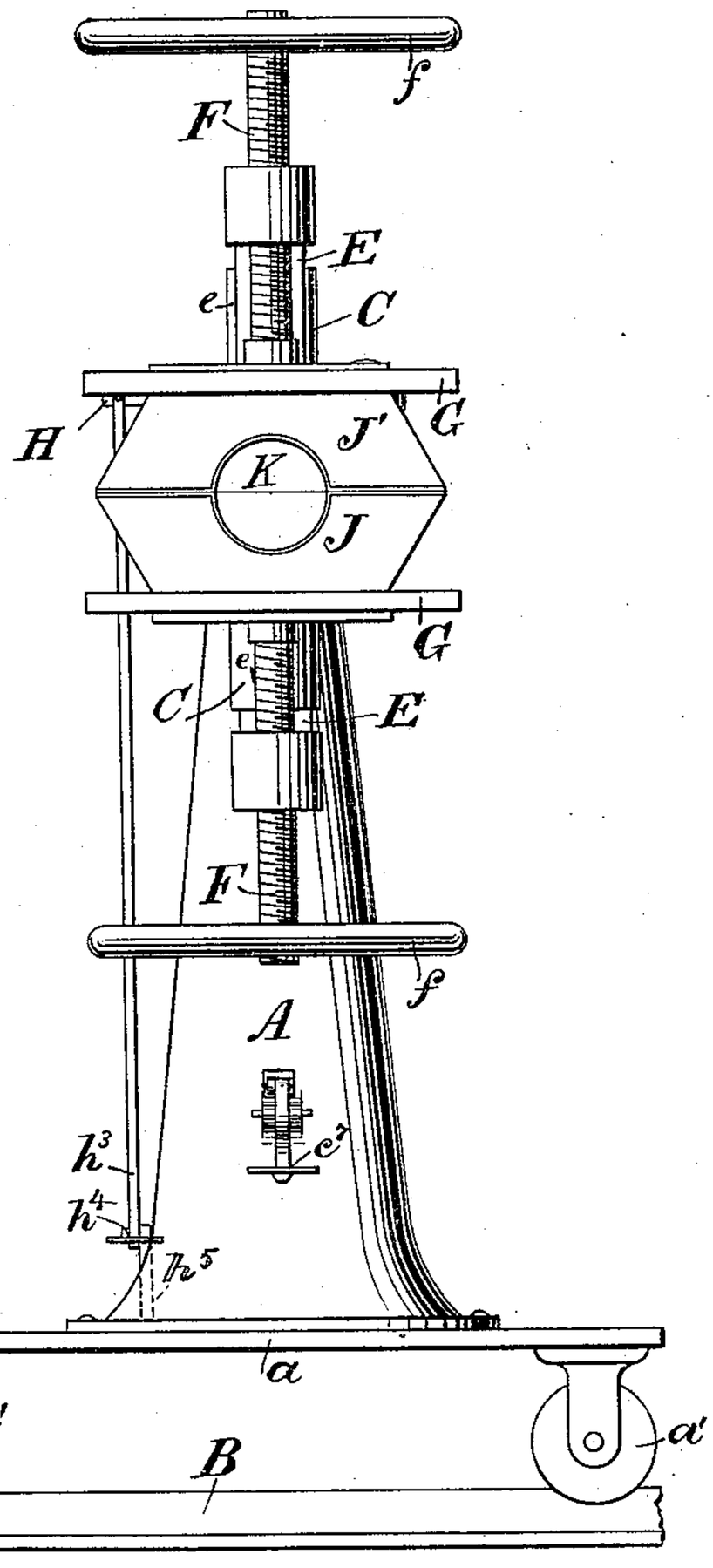


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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MOLDING APPARATUS.

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Fig. 5.

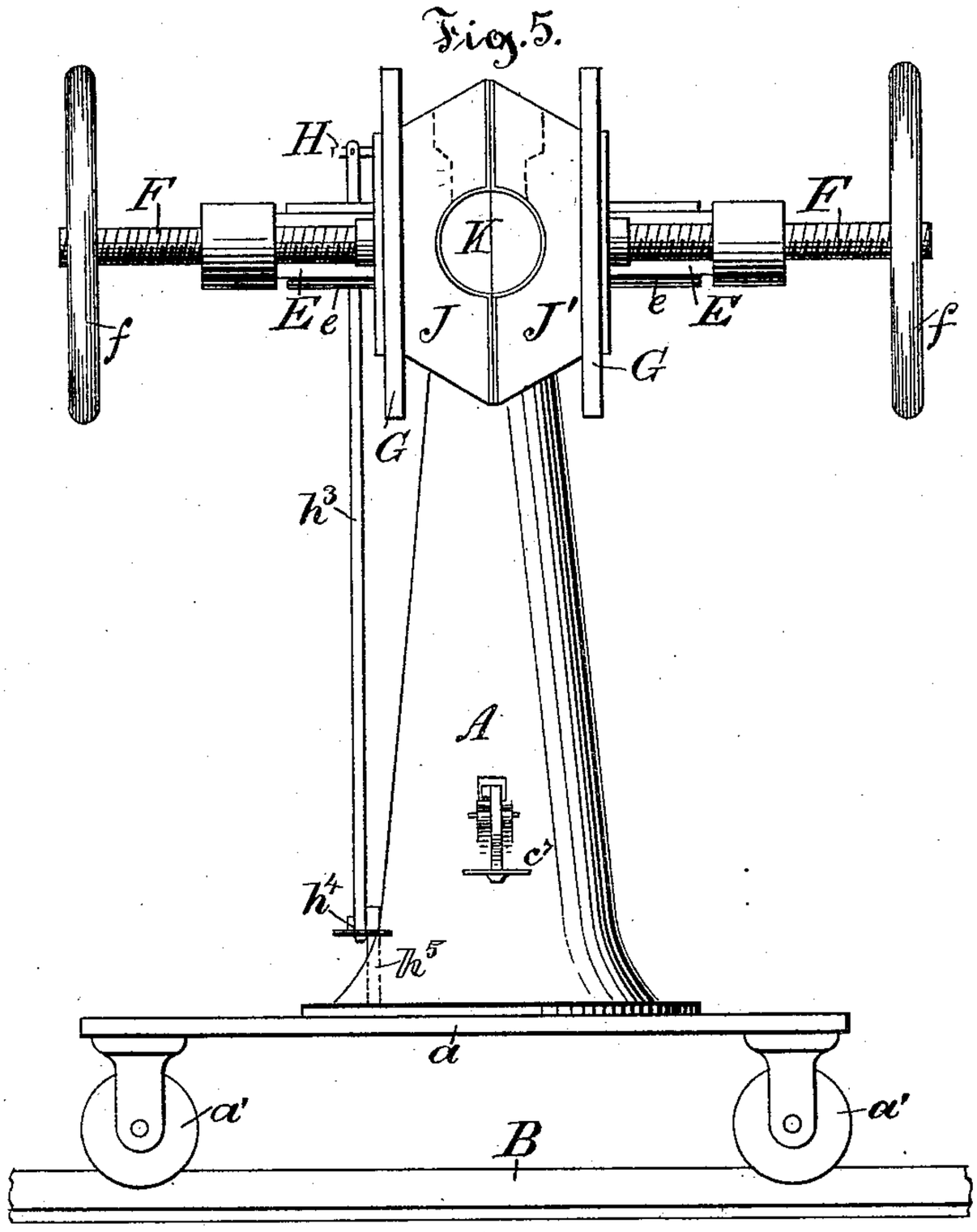


Fig. 6.

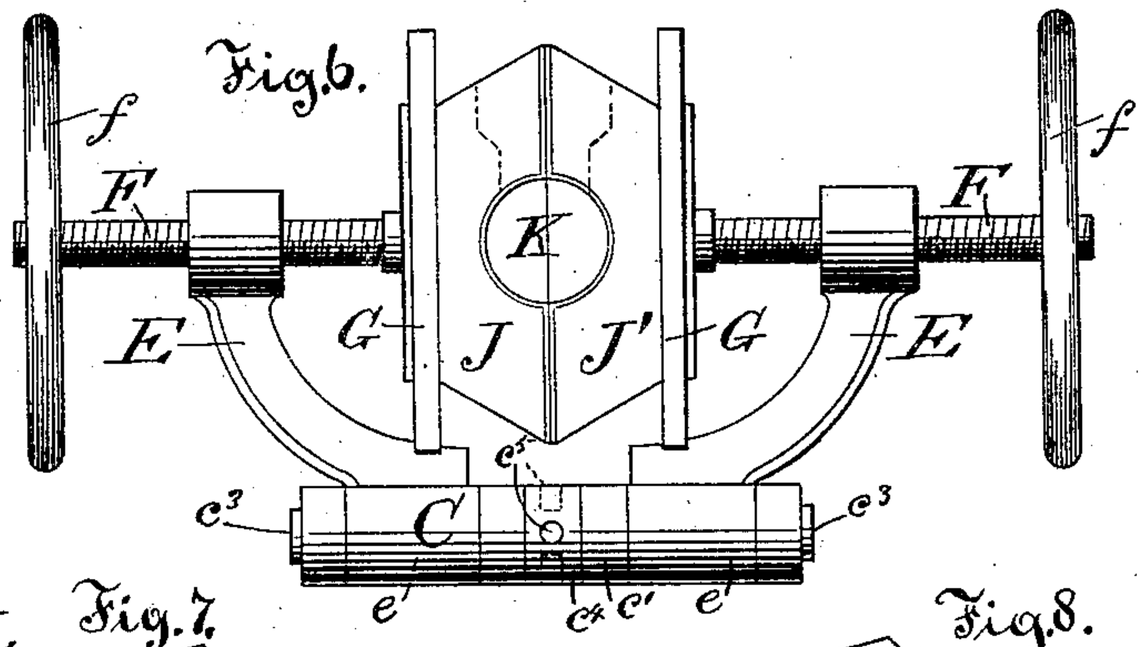


Fig. 7.

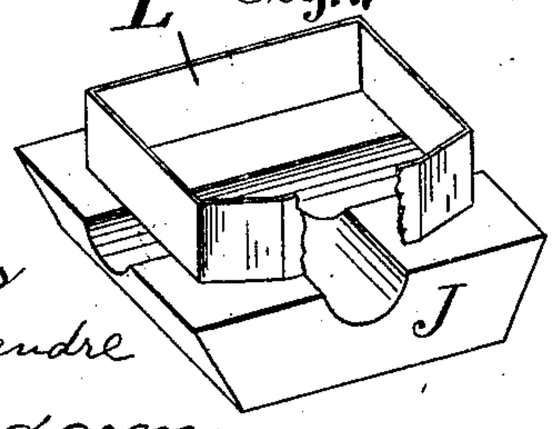
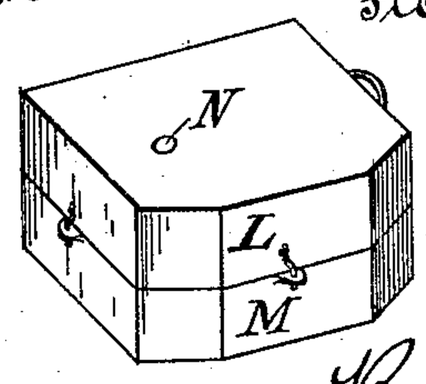


Fig. 8.



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UNITED STATES PATENT OFFICE.

DAVID CARLIN, OF PITTSBURG, PENNSYLVANIA.

MOLDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 444,588, dated January 13, 1891.

Application filed August 21, 1890. Serial No. 362,582. (No model.)

To all whom it may concern:

Be it known that I, DAVID CARLIN, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Molding Apparatus, of which the following is a specification.

My invention relates to an improvement in molding apparatus, the object being to provide means whereby bench-molding may be made feasible in cases where heretofore floor-molding has been commonly resorted to, thereby facilitating the operation of molding and rendering it practicable to employ unskilled labor, materially reducing the amount of labor required, and hence the cost.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the molding apparatus in side elevation, partly in section. Fig. 2 is a partial rear view. Fig. 3 is a front view showing one of the clamping-plates turned off to one side and one of the follow-boards removed. Fig. 4 is a front view showing the parts in assembled adjustment with follow-boards and clamping-plates in horizontal position. Fig. 5 is a front view showing the follow-boards and clamping-plates turned in the vertical position. Fig. 6 represents the same swung into upright position above the spindle. Fig. 7 represents in detail one of the follow-boards and one of the sections of the mold, the cope-section, for example, showing the position which the mold-section assumes relatively to the follow-board when placed in position after the core is formed. The core and pattern are omitted from this figure, and a portion of the front of the cope-section is broken away. Fig. 8 represents the exterior of the mold complete, and Fig. 9 is a view in detail taken transversely through the spindle.

A represents a suitable standard or support, shown in the present instance as resting upon a base-plate *a*, the latter being supported upon wheels *a'*, which travel upon tracks B for convenience in moving the molding apparatus into proximity to the pile of sand, and thereby saving carrying of the sand to the position where it is to be used.

Upon the support A a rotary or swinging supporting-head C is mounted, as follows: A horizontal arm *c* of the swinging head is mounted in a suitable bearing D, fixed to the support A, so that it may be freely rotated. Arms *c'* and c^2 of the head extend in diametrically-opposite directions from the portion *c* and form bearings for a spindle c^3, loosely mounted therein as a support for the bracket-arms E. The bracket-arms E are provided with sockets *e*, which are fixed upon the spindle in any well-known or approved manner—as, for example, by set-screws—thereby enabling the bracket-arms to be swung together with the spindle to the right or left in planes transverse to the plane of rotation of the head as a whole, in the bearing D. The spindle c^3 is provided centrally with a collar c^4, having notches c^5 formed at intervals therein. A spring-actuated dog c^6 is normally pressed in a direction to engage the notches c^5, and may be released at pleasure by the pressure of the foot upon a pedal c^7, connected with the dog c^6 by a lever c^8. In the front end of the bracket-arms E screw-threaded sockets are provided in which clamping-screws F are seated. The outer ends of the clamping-screws F are provided with hand-wheels *f* for operating them, and to their inner ends are secured clamping-plates G. The space between the outer ends of the bracket-arms E, when the two arms are swung into the same plane, is intended to be sufficient to receive the clamping-plates G and the follow-plates and cope and drag sections of the mold.

The swinging head C is here shown as held in its bearing D by means of a collar *d* secured to its rear end, and said collar *d* is provided at intervals with notches *d'* for the reception of a locking-tooth *h*. The locking-tooth *h* is located on a lever H, fulcrumed on a suitable bracket-arm *h'*, extending upwardly from the bearing D, and provided on one end with a weight h^2, which tends to hold the tooth *h* normally in engagement with one of the notches *d'*. The mechanism for lifting the lever H, so as to disengage the tooth *h* from the notch *d'* when it is desired to rotate the head C, consists of a connecting-rod h^3, leading from the end of the lever opposite the weight h^2 down to a foot-lever h^4, fulcrumed in a suitable bearing h^5 at the rear of the base and extending forwardly into convenient position to receive the foot of the operator.

A lower follow-board J is fitted to receive one-half of the pattern, and is adapted to rest upon the lower clamping-plate G when the latter is turned into a horizontal position, the said clamping-plate G serving as a bench upon which to form the mold. A corresponding upper follow-board J′ is fitted to receive the other half of the pattern and to rest beneath the upper clamping-plate G.

In using the terms "upper" and "lower" I have reference to the position of the parts as represented in Figs. 1 and 4. It is obvious, of course, that either of the follow-boards J or J′ and either of the clamping-plates G may be made the lower instead of the upper by swinging the head C into reversed position.

The grooves or recesses in the follow-boards for the reception of the pattern-sections extend beyond the points where the ends of the pattern would rest when in position therein. For example, in Fig. 7 the cope-section of the mold is represented with its sides a short distance back from the ends of the recess in the follow-board J, and it is intended that the pattern shall rest with its ends within the sides of the mold-sections, leaving a short space between the sides of the mold-section and the extreme ends of the pattern. Such space between the inner walls of the mold-section and the ends of the pattern have their function in providing a space for the reception of the sand for the support of the core, as will hereinafter appear.

The follow-boards J and J′ are so constructed that when the pattern-sections are placed therein and the follow-boards brought together face to face they will form a closure, save only at the points opposite the open ends of the pattern, and will hold the sections securely in position.

The pattern is represented herein by K, and consists of two half-sections of a T branch of a pipe. When the two half-sections of the pattern K are placed in position between the follow-boards J J′ and the latter are forced together by the clamping-plates, the corresponding recesses in the follow-boards (see, for example, the recess in the follow-board J, shown in Fig. 7) will form tubular projections outwardly beyond the points which the ends of the pattern occupy between the follow-boards, and into these tubular openings the sand or other suitable material is rammed, filling the pattern, while its sections are held firmly in position, and thereby forming the core. The pattern clamped between the follow-boards may be swung into any position desired in which the core can be most conveniently formed, as, for example, into the positions shown in Figs. 5 and 6. After the core has been thus formed the follow-boards and pattern may be swung into horizontal position, such as shown in Fig. 4, one of the follow-boards—J′, for example—removed, and the clamping-plate G swung off to one side out of the way, as shown in Fig. 5. At this point in the operation one half-section of the pattern will be exposed above the lower follow-board J, and the half-section of the core will also be exposed extended from the ends of the pattern out to the edges of the follow-board. One section of the mold being now placed in position with respect to the follow-board J, as shown in Fig. 7, its sides will cut down the half-section of the molded core at short distances away from the ends of the pattern until the lower edges of the half-section of the mold rest upon the face of the follow-board J. The sand, being now packed into the mold-section upon and around the ends of the pattern-section, will come in contact with the molded core in the spaces between the ends of the pattern and the inner walls of the mold-section, and will thereby form an impression corresponding to the half-section of the pattern. The clamping-plate being then swung back into position and the half-section of the mold and the follow-board being reversed so as to bring the follow-board uppermost, the same steps are taken with respect to the other section of the mold, and the mold is then completed.

To remove the pattern from the completed mold, the uppermost section of the mold, after it has been packed, is lifted off and one half-section of the pattern removed. That section of the mold is then replaced and the other section of the mold swung into the uppermost position, removed, and the other half-section of the pattern removed, the mold-section is replaced, and the mold is then ready for pouring. It will be observed that the molded core is supported in its position within the mold by the sand which is packed between the end of the pattern and the interior wall of the mold, as this comes in contact with the molded core, which projects beyond the ends of the pattern, suitable provision, of course, being made for enabling this portion of the packed sand to cleave from the core when the mold-section is removed for drawing the half-section of the pattern. Such provision for cleaving may be made by the insertion of a thin membrane in case the newly-packed sand should not readily cleave from the previously-packed core without such insertion.

The sprue shown at N, Fig. 8, may be formed by the insertion of a pin, which may be withdrawn when the pattern-section, are removed, forming communication between the exterior of the mold and the space which the sections of the pattern previously occupied in any well-known or approved manner.

In the completed mold shown in Fig. 8 the drag-section of the mold is represented by M and the cope-section by L.

In Fig. 1 I have shown the swinging head with the parts carried thereby mounted upon a wheel-truck running on a track, and this structure has its advantages in moving the apparatus from place to place. It is not, however, necessary to the practical operation of the several parts herein shown and described.

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

1. In molding apparatus, the combination, with a suitable support, of a rotary or swinging head mounted thereon and mold-supporting plates secured to the head and having a swinging adjustment relative thereto, the said rotary or swinging head forming the sole support for the plates and leaving free access to them in front and on both sides, substantially as set forth.

2. In molding apparatus, the combination, with a suitable support, of a rotary or swinging head mounted on the support and a pair of swinging mold-supporting plates mounted opposite each other on the head and having a swinging movement relative thereto, leaving a free open space for access to the plates in front and on both sides, substantially as set forth.

3. In molding apparatus, the combination, with a suitable support and a rotary or swinging head mounted thereon, of a pair of mold-supporting plates mounted on the head and having swinging movements in the plane transverse to that in which the head rotates or swings, the said plates being mounted in the same axial line in front of the supporting-head, leaving a free space for access thereto in front and on both sides, and means for forcing the mold-supporting plates toward and away from each other, substantially as set forth.

4. In molding apparatus, the combination, with a suitable support and a rotary or swinging head mounted on the support, of a pair of diametrically-opposite bracket-arms mounted on the head and having a swinging movement in unison relative to the head, and a pair of mold-supporting plates supported in front of the swinging head by screws from the said arms, and means for operating the screws to force the plates toward and away from each other, substantially as set forth.

5. In molding apparatus, the combination, with a pair of mold-supporting clamping-plates and a support for the plates, the said support having a rotary or swinging movement to reverse the plates and the plates being located in an axial line in front of their common support, leaving free access between them from the front and both sides, of follow-boards arranged to receive the opposite half of the pattern and form together therewith a core-box, the said follow-boards having a removable adjustment between the said clamping-plates, substantially as set forth.

6. In a molding apparatus, the combination, with a suitable support, a rotary or swinging T-shaped head mounted on said support, and mold-supporting plates secured to the opposite branches of the swinging head, of stops arranged at intervals along the path of the bearing of the head, a latch located in position to engage the stops and lock the head in the desired adjustment, and means for operating the latch, substantially as set forth.

7. In molding apparatus, the combination, with a suitable support, a rotary or swinging head mounted thereon and provided with mold-supporting plates having a rotary adjustment in the swinging head, of a series of stops and a latch, the one secured in the rotary dog and the other upon the rotary plate-support, and a foot-lever connected with the dog for operating it, substantially as set forth.

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