

(No Model.)

S. ALLEY & J. A. MACLELLAN.  
APPARATUS FOR MAKING MOLDS.

No. 397,683.

Patented Feb. 12, 1889.

FIG. 1.

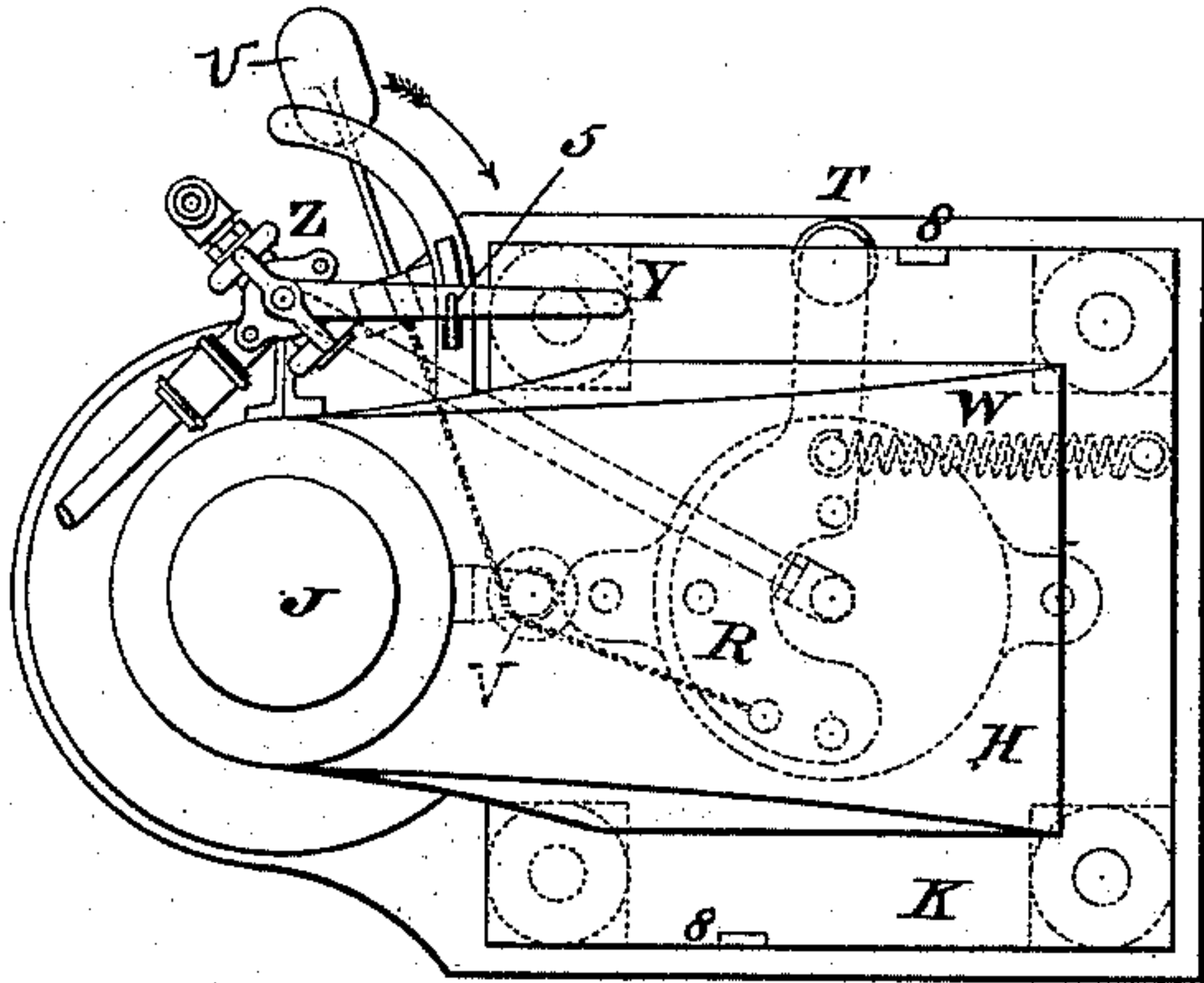


FIG. 4.

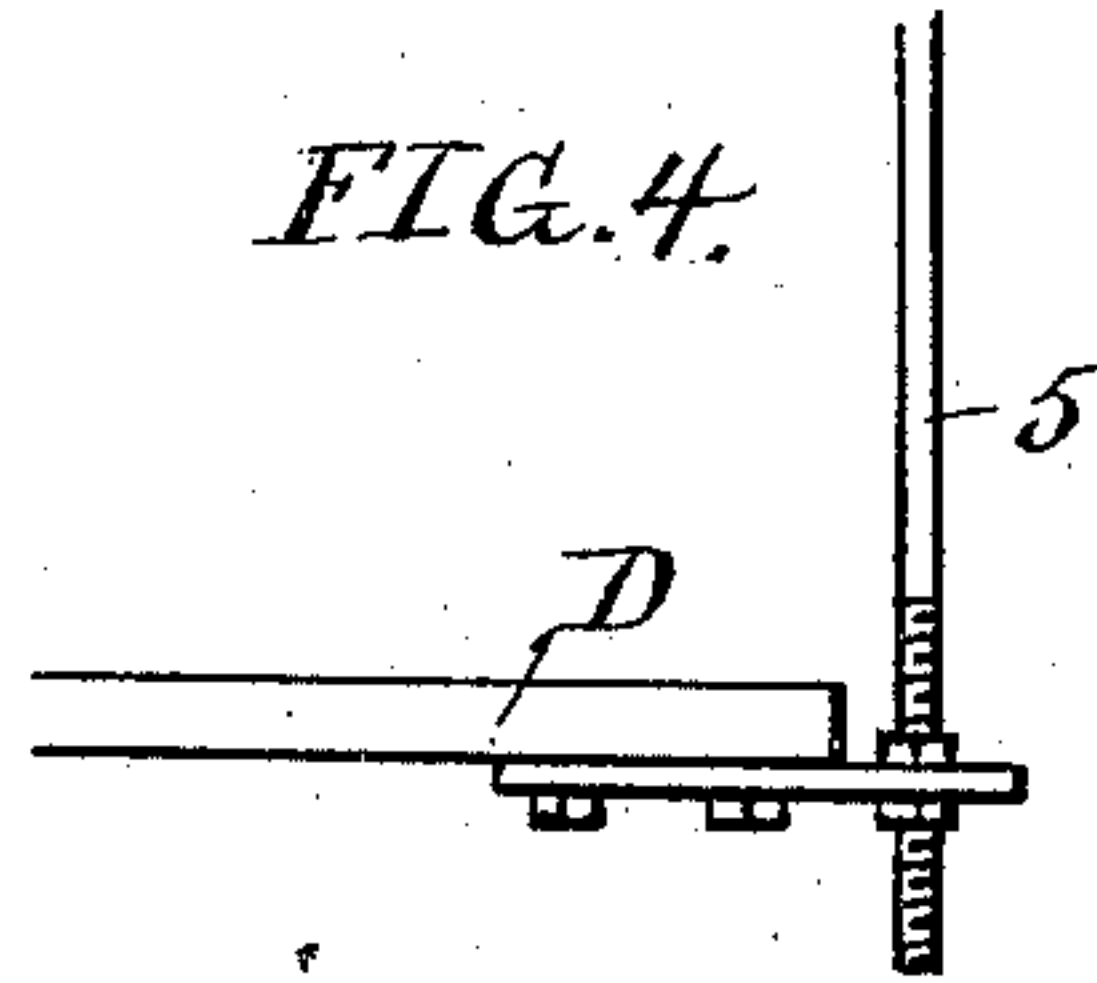
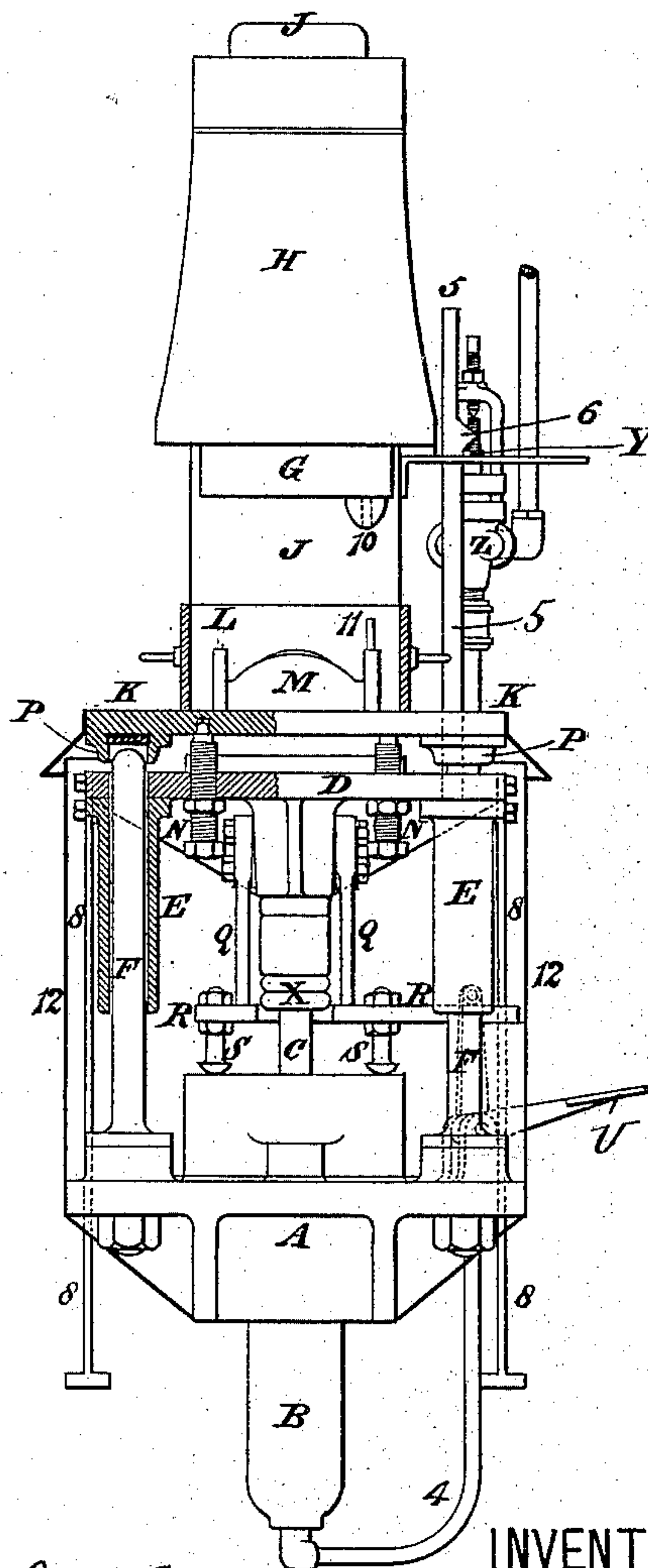
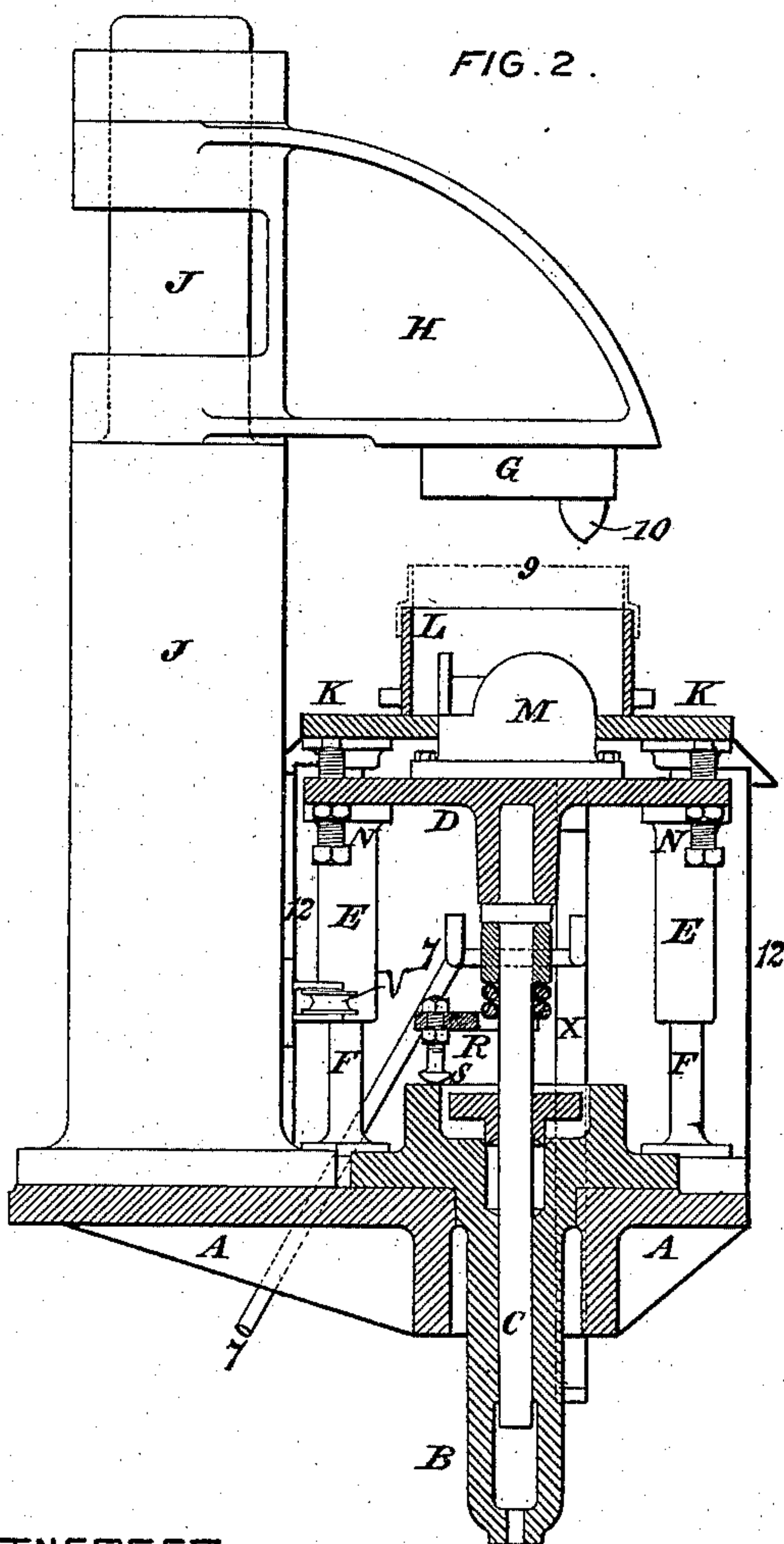


FIG. 3.



WITNESSES:

E. J. Griswold.  
John Revell.

INVENTORS:

Stephen Alley & John A. MacLellan,  
By their Attorneys,  
Horson and Horson



# UNITED STATES PATENT OFFICE.

STEPHEN ALLEY AND JOHN A. MACLELLAN, OF GLASGOW, COUNTY OF  
LANARK, SCOTLAND.

## APPARATUS FOR MAKING MOLDS.

SPECIFICATION forming part of Letters Patent No. 397,683, dated February 12, 1889.

Application filed August 29, 1888. Serial No. 284,041. (No model.)

### *To all whom it may concern:*

Be it known that we, STEPHEN ALLEY and JOHN ALEXANDER MACLELLAN, subjects of the Queen of Great Britain and Ireland, and residents of Glasgow, in the county of Lanark, Scotland, have invented certain Improvements in Apparatus for Making Molds for Casting, of which the following is a specification.

10 Our invention has for its object to construct and arrange apparatus for making molds for casting in an improved manner, and so as to save labor and time, especially in cases in which large quantities of castings  
15 are required off the same pattern, our present invention being in part the same as that for which we obtained British Letters Patent, dated March 4, 1887, No. 3,294, and in part an improvement thereon.

20 In apparatus of the kind referred to a hydraulic cylinder forces a platen carrying the mold-box with the pattern in it and with the sand or mold material heaped upon the pattern with considerable speed up against a  
25 fixed block, so as by the concussive action and following pressure to effect the ramming operation in a satisfactory and rapid manner.

In the accompanying drawings, Figure 1 is a plan, and Figs. 2 and 3 are side and front  
30 sectional elevations. Fig. 4 is a detached view.

The apparatus is carried upon a massive bed-plate, A, in an opening in which there is fixed a hydraulic cylinder, B. The ram C of  
35 the hydraulic cylinder carries a platen, D, which is guided in its vertical movements by tubes E, fixed to its four corners and working on rods F, fixed down to the bed-plate. These short rods F are used instead of the long  
40 rods which in ordinary hydraulic presses connect the bed-plate to an overhead entablature; and instead of using an entablature connected by rods to the bed-plate we employ for resisting the action of the press a  
45 block, G, of wood, fixed to a strong bracket, H, which is fitted on the upper end of a massive pillar, J, standing at the back of the machine and fixed down to the bed-plate A.

With this arrangement there is, except where  
50 the pillar J is, clear space all round the ma-

chine for putting on and taking off mold-boxes and for filling in the sand or mold material.

Above the platen D there is a parting-plate, K, on which the mold-box L is placed, while the pattern M is fixed to the platen D, 55 and, when a mold is being filled and pressed, projects up through an opening in the parting-plate K, such opening being shaped exactly to the contour of the pattern at the parting plane. The parting-plate K is accurately adjusted by means of screws N, screwed  
60 up through the platen D and fixed by jam-nuts.

The sand or mold material is shoveled into the mold-box L when the parts are in the positions in which they are shown in Figs. 2 and 3, and is filled in so as to be heaped up to  
65 some extent above the middle of the pattern M. In some cases the quantity of sand or mold material may be measured by means of a light frame (indicated by dotted lines 9 in Fig. 2) temporarily placed on the top edges  
70 of the mold-box L, enough sand or mold material being supplied to fill up to the top of this frame. The water under pressure is then admitted into the hydraulic cylinder B, 75 and the ram C, with the parts carried by it, is run rapidly up. The block G above is shaped to enter easily within the mold-box L, and the result of the operation, when adequate  
80 speed and pressure are employed, is to form a mold with the sand or mold material pressed on all parts of the pattern with sufficiently-uniform density. The block G has fixed to its under side a projection, 10, to form a gate  
85 in the mold, this projection being made with a hole, into which a pin, 11, on the pattern M enters when raised. As soon as the compression of the sand or mold material has been effected, the hydraulic ram C is lowered, and  
90 the parts carried by it descend, but to different positions. The parting-plate K descends until stopped by the tops of the fixed rods F, which extend up through holes in the platen D, as shown in Fig. 4, and are en- 95 countered by rubber buffer-pieces fixed in cups P, formed on the under side of the parting-plate K at the corners. The descent of the platen D is for a moment arrested when the parting-plate K is stopped; but imme-



diately afterward the platen D descends as much farther as to lower the pattern M down through the parting-plate K. The mold-box L, with the molded sand in it, can then be removed, and an empty mold-box be put into its place for the next molding operation. For the purpose of temporarily arresting the descent of the platen D, as described, there are fixed to its under part two legs, Q, which temporarily rest upon a chock-plate, R. (Indicated by dotted lines in Fig. 1.) This chock-plate R itself rests by means of adjustable screw-pins S upon an annular projection formed on the hydraulic cylinder B, and it is arranged like a lever to turn on a center, T, at one side. A treadle, U, in the form of a bell-crank is provided for withdrawing the chock-plate R, being connected to it by a chain passing round a guide-pulley, V, while a spring, W, draws the chock-plate R into position for arresting the descent of the platen D as soon as, in rising, the legs Q get above the chock-plate. When the platen D descends to its lowest position on the withdrawal of the chock-plate R, violent concussion is avoided by rubber rings X, placed on the ram C, so as to encounter the stuffing-box gland of the hydraulic cylinder B.

The movements of the apparatus are controlled by a hand-lever, Y, fixed on the spindle of a valve in a valve-box, Z, through which the water passes on its way to and from the hydraulic cylinder B, the valve-box being connected to the cylinder by a pipe, 4, and having supply and exhaust pipes connected to it. The speeds at various parts of the descent are controlled automatically by a rod or bar, 5, which is adjustably fixed to the platen D, so as to move therewith. The bar 5 is formed with a cam-surface, 6, which, when the hand-lever Y is pressed round in the direction of the arrow in Fig. 1 to put the cylinder in communication with the exhaust, partially closes the exhaust at the time when the pattern M is beginning to be withdrawn from the parting-plate K.

Owing to the rapidity with which, when our improved apparatus is used, molds can be formed, the castings made, and the sand or mold material be ready for use over again, it happens that the sand or mold material is in a warm condition when put into the mold-box, and condensation of moisture is apt to take place upon the pattern, which is itself a casting, and cause imperfect work and inconvenience. To avoid this trouble, we keep the platen D, and through it the pattern M, in a warm state by means of two or more Bunsen jets of gas and air burning beneath the platen and supplied by a pipe, 7. In order to limit the upward movement of the platen D and

parts on it when from inadvertence it is raised without there being sand in the mold-box L, a pair of bars, 8, are fixed to the platen, being entered up through slots in the bed-plate A and having heads on their bottom ends, which, not being able to pass through the slots, act as stops. The space beneath the platen D is inclosed by thin iron sheets 12 to keep out the sand.

What we claim is—

1. Molding apparatus comprising, in combination, a hydraulic cylinder with its ram extending upward and having a platen, a pattern fixed on the platen, a parting-plate with a contour opening through which the pattern can project, adjusting-pins screwed in the platen to determine the position of the parting-plate when lifted by the platen, a mold-box, a resisting-block above the platen, a movable chock-plate for temporarily supporting the platen at a point in its descent, and a valve for controlling the action of the water in the hydraulic cylinder, the several parts being arranged and operating substantially as herein set forth.

2. Molding apparatus comprising, in combination, a hydraulic cylinder with its ram extending upward and having a platen, a pattern fixed on the platen, a parting-plate with a contour opening through which the pattern can project, adjusting-pins screwed in the platen to determine the position of the parting-plate when lifted by the platen, a mold-box, a resisting-block above the platen and fixed upon a bracket upon a pillar at the back of the machine, a movable chock-plate for temporarily supporting the platen at a point in its descent, and a valve for controlling the action of the water in the hydraulic cylinder, the several parts being arranged and operating substantially as herein set forth.

3. In molding apparatus having a rising platen with a pattern fixed on it, a parting-plate adjustable in relation to the platen, combined with a device for guiding the platen and stopping the parting-plate when the platen has partly descended, such device consisting of rods fixed to the bed-plate and extending up through guide-tubes fixed to the platen, with their upper ends acting as stops for the parting-plate, substantially as herein set forth.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

STEPHEN ALLEY.  
J. A. MACLELLAN.

Witnesses:

EDMUND HUNT,  
DAVID FERGUSON.