

(No Model.)

W. N. BARROWS.
Apparatus for Molding Shells.

No. 230,916.

Patented Aug. 10, 1880.

Fig. 1.

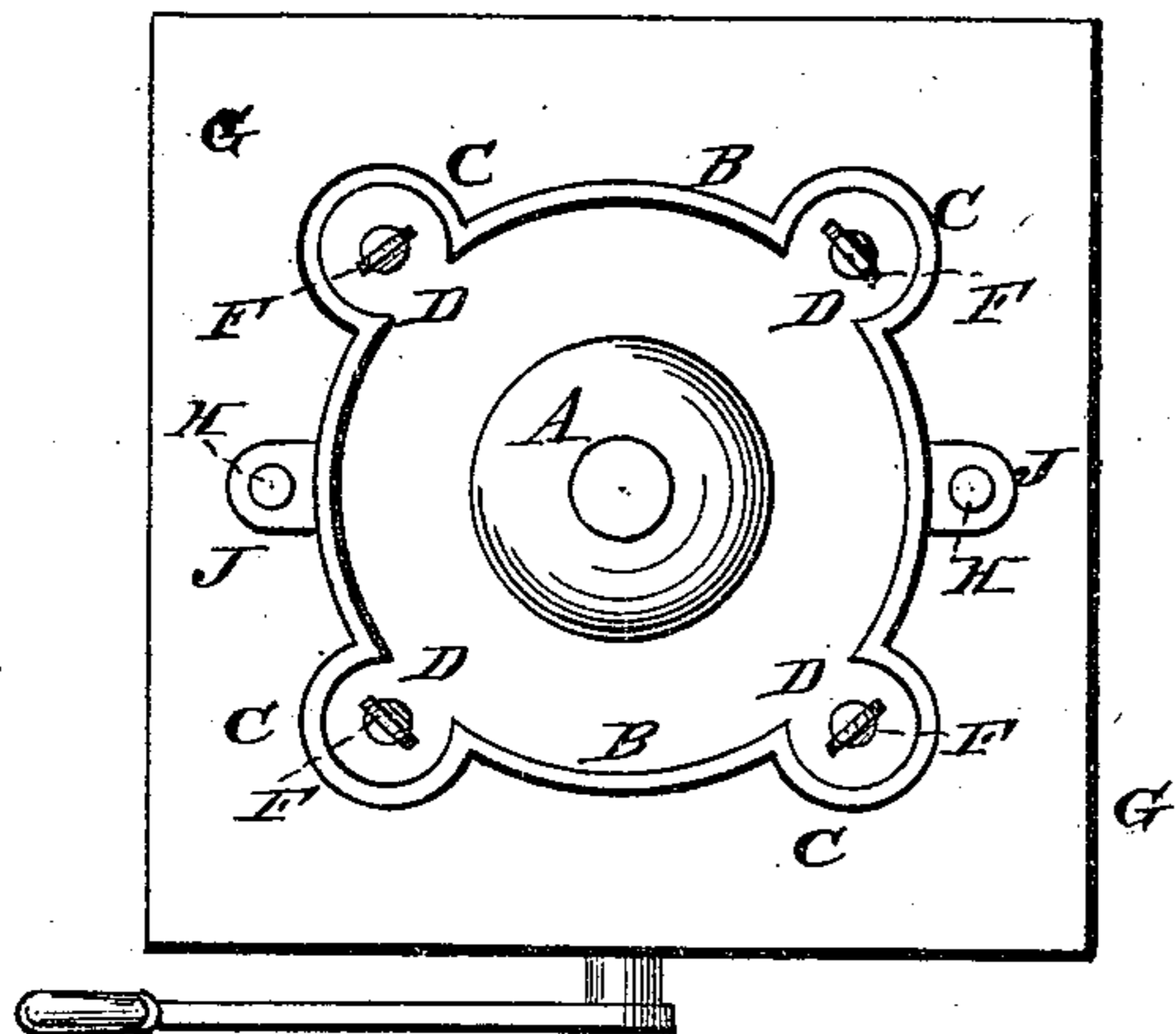


Fig. 2.

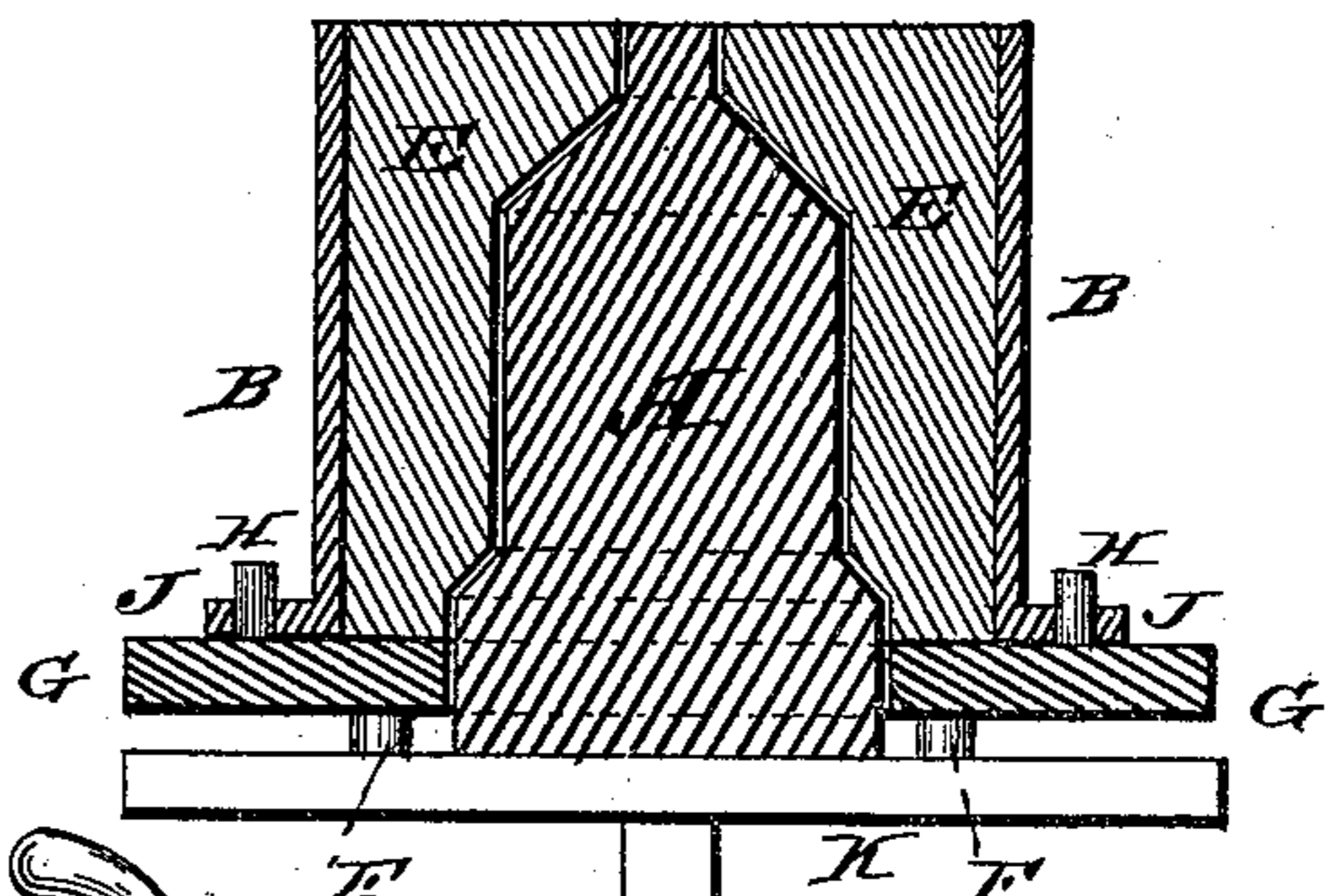


Fig. 3.

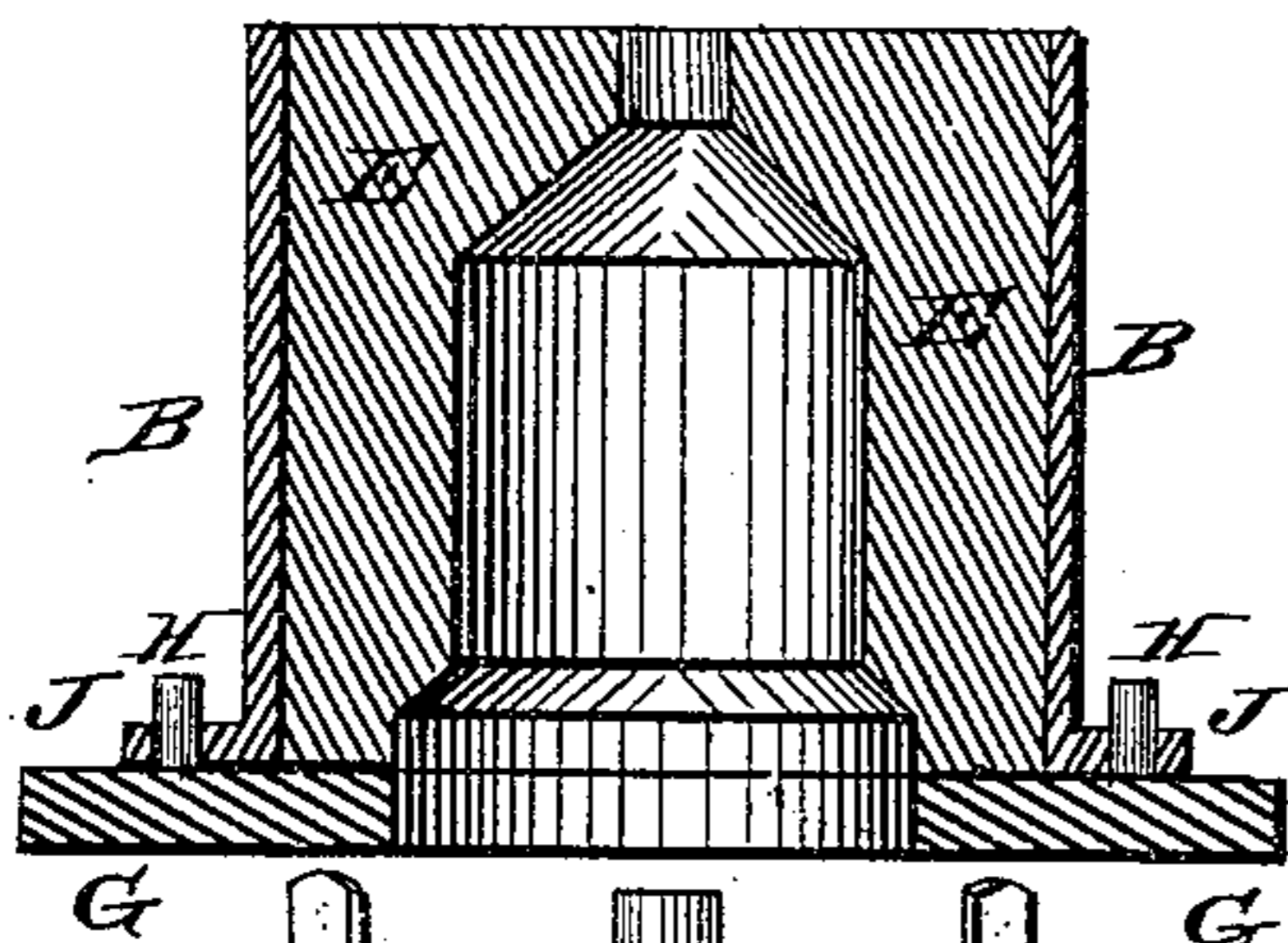


Fig. 5.

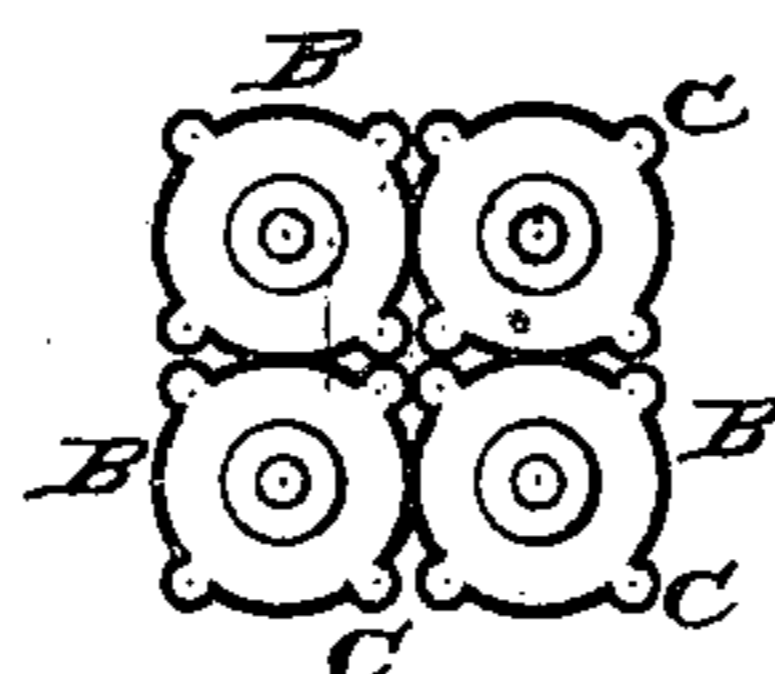


Fig. 6.

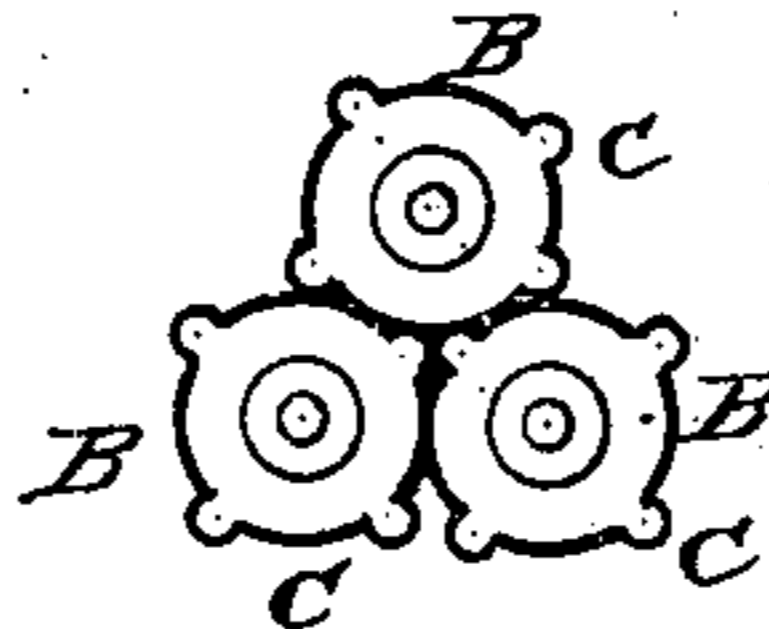


Fig. 4.

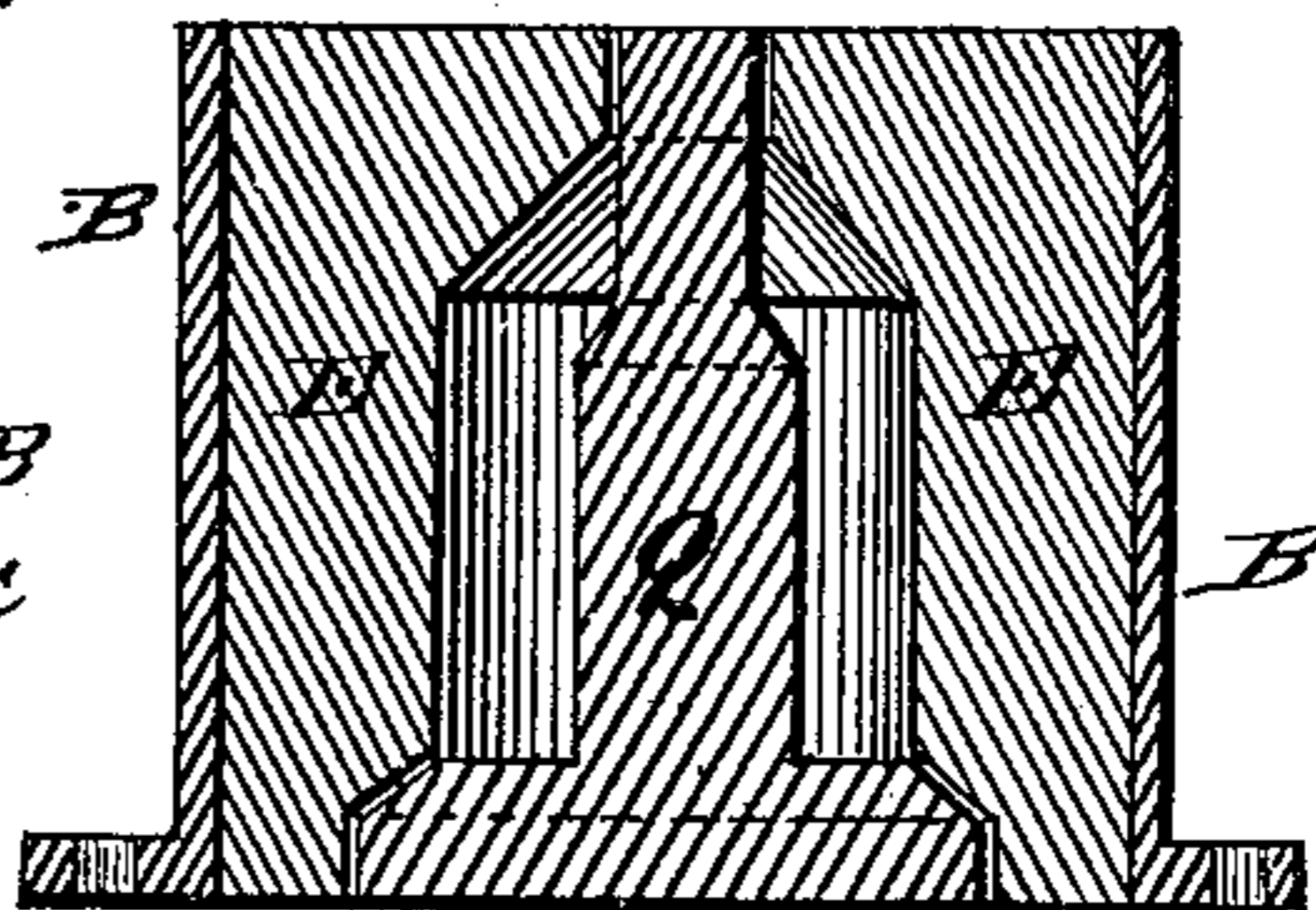
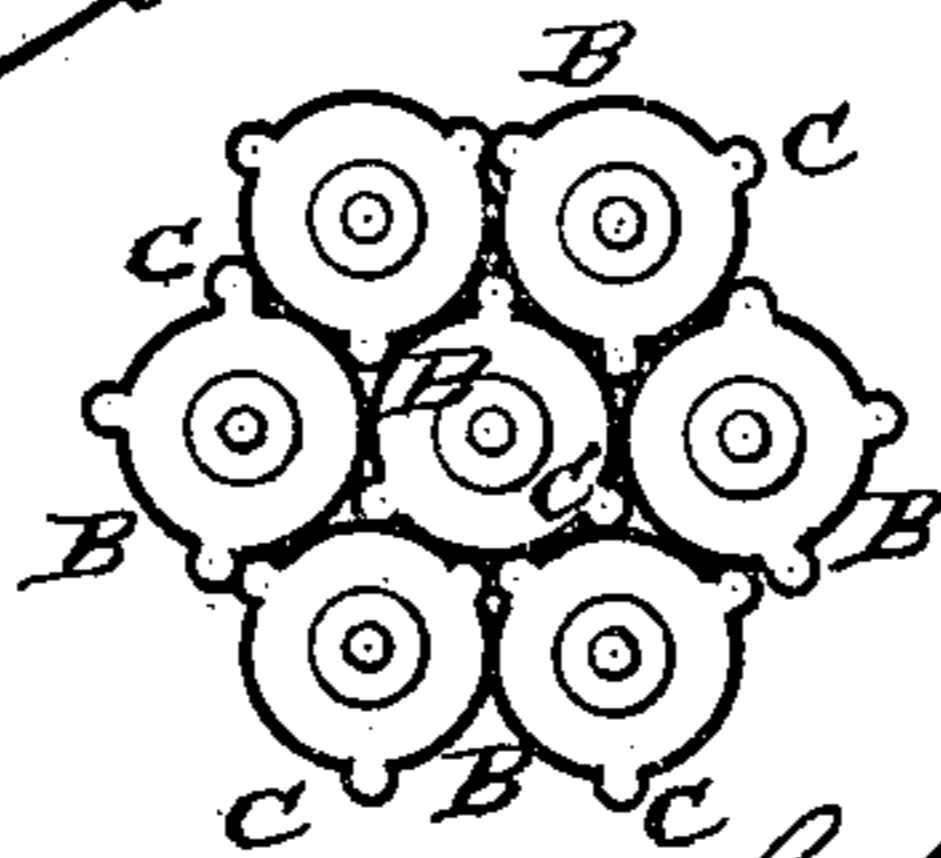


Fig. 7.



Witnesses.

P. C. Dietrich
J. B. Stockman.

Per

Inventor
Wm. N. Barrows.
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM N. BARROWS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
HENRY J. HAND, OF SAME PLACE.

APPARATUS FOR MOLDING SHELLS.

SPECIFICATION forming part of Letters Patent No. 230,916, dated August 10, 1880.

Application filed April 16, 1880. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM NELSON BARROWS, of the city and county of Philadelphia, and State of Pennsylvania, have invented a
5 certain new and useful improvement in apparatus for molding castings, specially useful for molding shells for ordnance, and shot and balls used for the welding of lapwelded tubes, and any kind of casting in which correct and
10 accurate circular form is specially desirable; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof to enable others skilled in the art to make and use the said invention.

15 My invention relates to that class of molds formed of sand rammed around a pattern, which pattern is afterward drawn or retracted by a guiding or guided mechanism; and has for its object a greater facility of evenly and
20 uniformly ramming the mold, of effectively venting the mold, and more uniform strength or resistance of the mold to straining from the pressure of the molten metal, so that the castings produced are of more nearly accurate
25 geometric form.

The nature of my invention consists in flask containing one or more chambers whose walls are equidistant from the pattern and provided with grooves or recesses in which sand is
30 placed not so highly rammed as in the body of the mold, and in which grooves blades or tapering needles work in forming vent-channels; also, in combining the venting needles or blades with the mechanism for drawing or re-
35 tracting the pattern; and, lastly, in the employment, in conjunction with a flask-pattern and needles, as above stated, of a mixture of sand and agglutinating-fluid, which, when dried after the withdrawal of the pattern, presents a
40 smooth accurately-shaped hard surface to the molten metal.

I will now proceed more particularly to describe my invention, referring in so doing to the drawings annexed and the letters of refer-
45 ence marked thereon.

Figure 1 shows a plan of the flask-pattern and molding-machine when empty. Fig. 2 shows a vertical section of the machine and flask with the pattern and sand contained
50 therein. Fig. 3 shows a vertical section of the

machine with the flask after the latter has been rammed up and the pattern and venting-blades withdrawn; and Fig. 4 shows a vertical section of a completed mold containing the core ready to be poured off or filled with molten
55 metal. Figs. 5, 6, and 7 show plans of multiple-molds or molds containing clusters of patterns which may be used in casting small articles.

The same letters of reference apply to the 60 same parts in the several figures.

A represents the pattern; B, the metallic frame or flask which surrounds it, having its side equidistant at all points from the pattern A, and having grooves or channels C, formed
65 with their open side D toward the pattern A.

E is the sand mixed with an agglutinating-fluid. F are tapering venting blades or needles, the smaller ends of which are upward.

G is a horizontal plate upon which the bot- 70 tom of the flask B rests, and on which it is held in position by dowel-pins H and lugs J. Through the plate G are apertures in which accurately fit the pattern A and needles F when up, and through which they can be
75 dropped or withdrawn.

The pattern A and needles F are fastened at their lower ends to a frame, K, working smoothly and accurately in a vertical direction in guides L and M, by a lever, N, and link O; 80 or it may be raised by a rack and pinion or toothed sector or segment or a cam.

The apparatus is operated in the following manner: The flask B is placed in position with the lugs J upon the dowel-pins H, and the pat- 85 tern A and needles F are raised and held up in the position shown in Fig. 2. Sand is then filled into the flask and rammed evenly therein by a rammer whose sides are shaped to conform to the curve of the internal surface of the 90 flask B, the pattern and needles then withdrawn by lowering the frame K, leaving sand in the mold compactly and evenly pressed in the shape of the pattern, while the sand in the grooves or channels C is looser and more open 95 and has channels or vent-passages extending from the under side of the mold up through it. The mold and flask containing it are then removed and dried, after which a core, O, is placed in it, as shown in Fig. 4. 100

The multiple or cluster molds are of similar construction, and merely a means of avoiding the large amount of handling incident to making small castings singly, the patterns and
5 venting-needles being withdrawn simultaneously from all of the molds.

Having described my invention and the mode of operating the same, what I claim therein as new and useful is—

10 1. The method of forming molds which consists in ramming the sand contiguous to the pattern and venting through the exterior unrammed sand, substantially as set forth.

2. The flask B, provided with channels C for retaining sand without the reach of the rammer in molding, as and for the purpose set forth. 15

3. The combination of tapering vent-needles F, with the guided pattern, drawing-frame K, and flask B, having channels C, as and for the purpose set forth.

WM. N. BARROWS.

Witnesses:

ALEX. H. SIEGEL,
J. DANIEL EBY.