2 Sheets--Sheet 1.

J. R. MOFFITT.

Apparatus for Molding Hollow Articles from Pulp.

No. 153,267. Patented July 21, 1874.

Fig. 1.

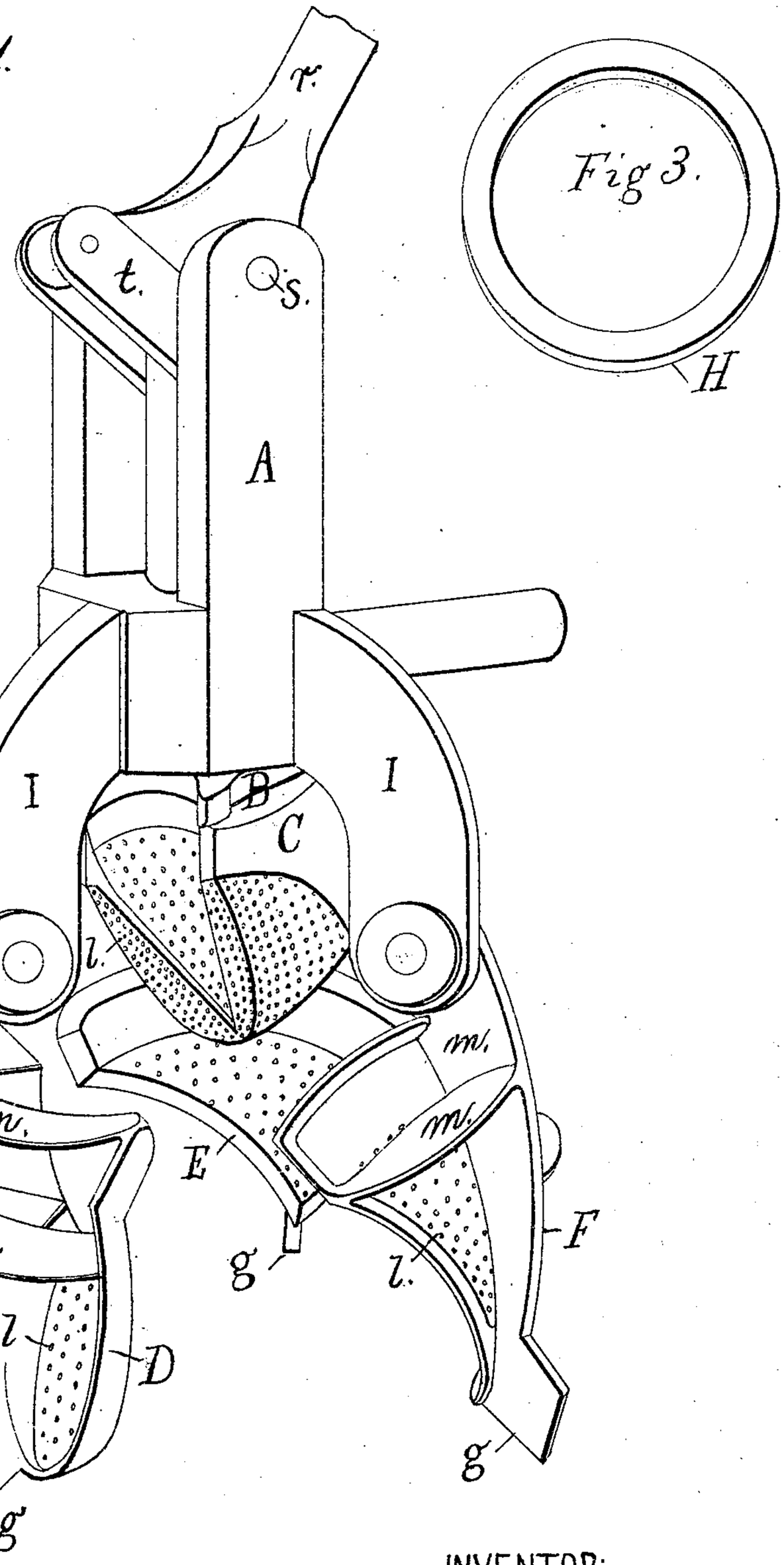

Fig 3.

WITNESSES:

Geo. T. Smallwood, Jr.

W. F. Hutchinson

INVENTOR:

John R. Moffitt

by John J. Halsted.

His Atty.

2 Sheets--Sheet 2.

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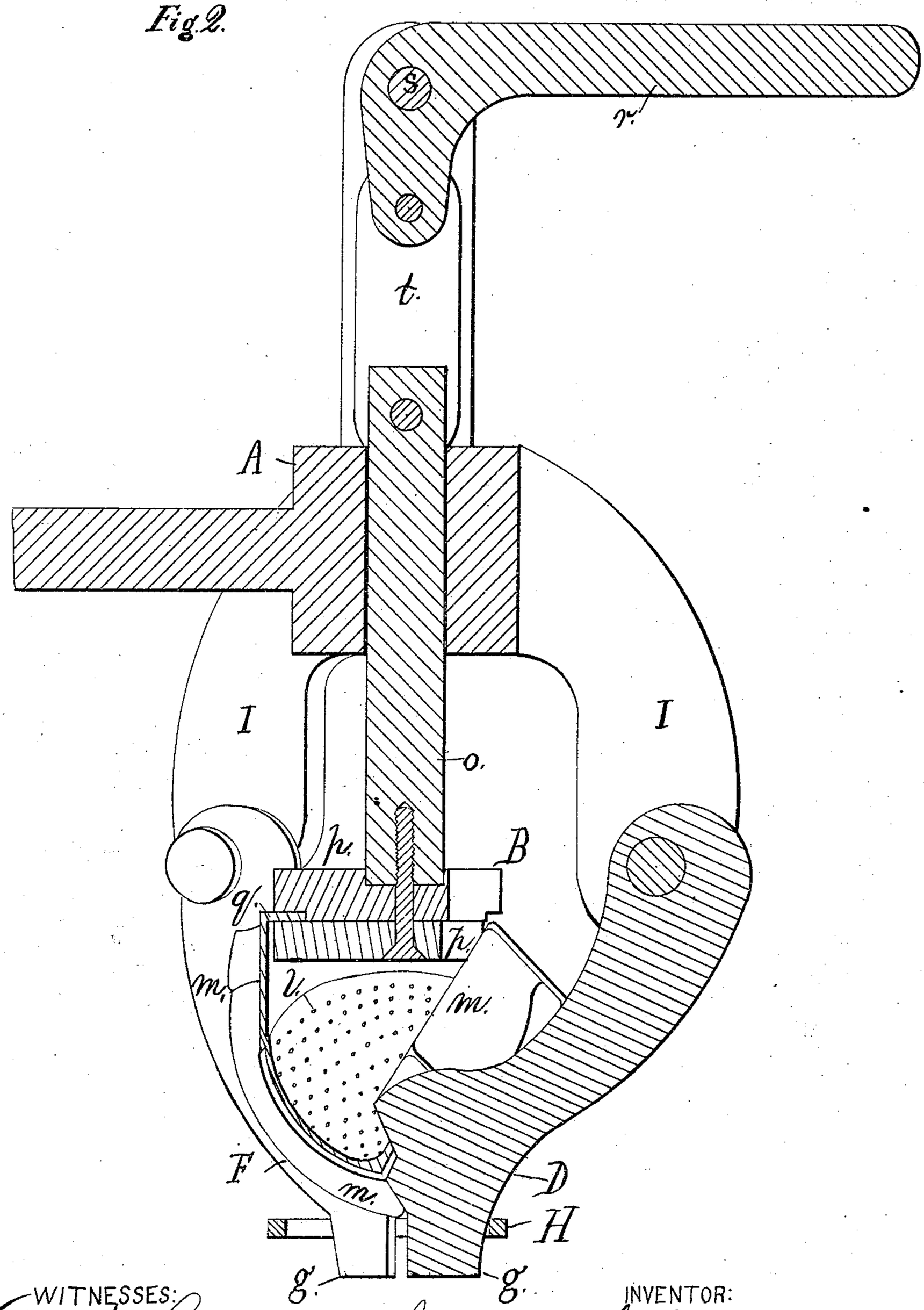
Fig. 2.



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THE GRAPHIC CO. PHOTO-LITH. 39 & 41 PARK PLACE, N.Y.

UNITED STATES PATENT OFFICE.

JOHN R. MOFFITT, OF CHELSEA, MASSACHUSETTS.

IMPROVEMENT IN APPARATUS FOR MOLDING HOLLOW ARTICLES FROM PULP.

Specification forming part of Letters Patent No. **153,267**, dated July 21, 1874; application filed January 30, 1874.

To all whom it may concern:

Be it known that I, JOHN R. MOFFITT, of Chelsea, Massachusetts, have invented an Apparatus for Molding Hollow Articles from Pulp, of which the following is a specification:

My invention relates to a special construction of apparatus expressly adapted for molding heel-counters. Heretofore it has been found difficult, if not impossible, to mold heel-counters directly from pulpy material on account of the obstructions offered by the surplus water, and also because of the tendency of the material to adhere to the walls of the mold, and the difficulty of removing the formed counter from the mold without injury.

My invention consists in the details of construction hereinafter set forth, embracing, primarily, a female mold perforated at bottom and sides, and of a configuration corresponding in the main to the exterior of a shaped counter, and provided with strengthening-ribs made integral therewith; a male die or plunger entirely open at top and perforated at bottom and sides, and also conforming to the shaped counter, and provided with strengthening-ribs, the plunger having an exterior enlargement extending around its upper part or rim for the purpose of closely filling up the mouth of the female die at a given stage, as hereinafter set forth; a sectional construction of the lowermost or female die, so that its parts may be freed to swing entirely off from the molded article to permit its ready removal; a means for locking these sections together, and a lever-connection for operating the plunger.

In the drawings, Figure 1 represents an elevation of my heel-counter mold, with the plunger raised and the sections not yet brought together. Fig. 2 is a vertical section through the center, the plunger being down and the sections being closed by the ring. Fig. 3 is a plan of a ring suitable for holding the sections together when closed.

A is a suitable frame or support, to which is attached the plunger B, which carries the male die C. D, E, and F severally represent sections or clamps (of which there may be two or more, as found desirable) of the female die, the sections being such that when brought together at their intended lines of junction they form a single female die for receiving the material or pulp; and, to sustain the pressure to be given to such material under the action of the plunger, each section has a tail or projection, *g*, so that when brought together they shall be embraced and held by a clamping-ring, H, and each, as shown, is attached to an arm, I, hinged to the frame, as seen, so as to permit them, when not held by the clamp-ring, to swing away from the counter after it has been molded and pressed to shape, and is ready for removal. They swing away by their own gravity, and thus leave ample space between them and the male die, and also between themselves, for the operator to remove the counter from the male die without any inconvenience from them. The upper or male die, as also each section of the other die, is perforated, as seen at *l*, so that in every direction water may escape, and from both sides of the body of the pulp or of the counter which is being formed. Each part of the dies is strengthened by ribs *m*, as seen.

The material is put into the mold before the plunger is forced down, and at any convenient point, and about in the condition of a thin paste; and the compound which I have found to produce a counter or product satisfactory for strength and firmness, I prepare from scraps of leather, fiber, resin, glue, and linseed-oil mixed with water to the consistency desired.

The male die is open or uncovered, and is secured to the plunger-rod *o* by clamping-plates *p p*, which clamp a rim or flange, *q*, on this die, or by any other appropriate means of fastening.

To operate this plunger-rod I employ a curved or angled hand-lever, *r*, pivoted to the body of the frame, at *s*, and to this lever I pivot a link, *t*, which is itself pivoted to the end of the plunger-rod. A very short movement of the link, through the movement of the lever-handle, gives all the movement required to the plunger or pressing-die C.

The die-sections may be arranged to slide or be slidden away instead of swinging away from the molded counter.

In some cases, I line the female mold and cover the male die with a fine sieve. Through this, as well as through the perforated molds, the water passes freely, and at the same time the solid matter is substantially retained.

This does not obviate the necessity of the perforated walls or their equivalents, save in very rare cases, inasmuch as the sieve has not sufficient strength or rigidity to resist the pressing usually required. Or, I make the walls of sieve or wire cloth, and support them on the back in any way that will allow the water to pass freely out; but these are very inadequate substitutes for molds having the walls perforated as above named. I make the lower mold capable of receiving a larger quantity of pulp than is needed for a counter. When the plunger descends, I find it best to give it a few rapid and short up-and-down movements, in order to agitate the pulp for the purpose of arranging the fiber to lay it in all directions, somewhat as in felting, thus giving a firmer body to the finished counter. This movement it is best to continue until the plunger has descended far enough for its enlarged head to enter and close the mouth of the female mold. This up-and-down movement should then cease, there being at that period just enough of the pulp left in this last-named mold to form a counter; and the remaining movement of the plunger is a downward one only, serving to compress the now confined and measured quantity of pulp, and to force any remaining water through, and only through, the pores of the dies, and not, as at an earlier stage of the movement, to splash it over, the enlargement at the head not only preventing such splash or overflow, but also serving as a wall or barrier against any undue upward rising of the pulp, and limiting it just as desired, and giving to the counter the proper irregular contour at its edges.

As the perforated molds permit some of the fibrous portions of the pulp to be forced into the perforations during the final pressure, the sectional character of the lower mold relieves from the difficulty that would otherwise attend its separation from the formed counter; and it will be observed that the sections swing about in a radial direction from a common center, so as to move as nearly as practicable in the direction of the perforations, so as most easily to be freed from the counter.

It is best that the material and the mold should both be warm during the operation. When the counters are removed from the dies they may be dried, in any appropriate manner, to such suitable degree as to fit them for being rolled or pressed, if desired, upon their surfaces, to solidify them for use.

An appropriate mechanism for such purpose is that described in my patent No. 127,090, dated May 21, 1872.

I do not herein claim, broadly, the combination of a perforated plunger and gravitating perforated die; but

What I claim, and desire to secure by Letters Patent in a molding-press for making heel-counters directly from pulp, is—

1. The open male die or plunger C, perforated at its sides and bottom, and operating to descend when pressing the pulp, combined with the sectional mold D E F, located beneath it and also peforated at its sides and bottom, the sections being hung as shown and described, so that when released they shall fall away from the plunger and leave an unobstructed space beneath it, and offer no impediment to the downward removal of the formed counter from the bottom of the plunger, all as shown and set forth.

2. The plunger C, made as described, with its side and bottom perforations and strengthening-ribs, and with a peripheral enlargement above the perforations, adapted to fit closely within the mouth of the closed sectional mold, to arrest the farther overflow of pulp after the plunger has expelled all the surplus pulp except the required quantity, and yet permitting the farther descent of the plunger to compress such remaining pulp, and to express the water therefrom through the sides both of the former and of the closed sectional die or mold, all as shown and described.

3. In combination with the sections of the female die, the ring H, for clamping the same together.

JOHN R. MOFFITT.

Witnesses:
JON. F. BARRETT,
WILLIAM STANDISH.