

S. Wheeler & E. Jerome.
Paper Molding.
N^o 61,968. Patented Feb. 12, 1867.

Fig 1.

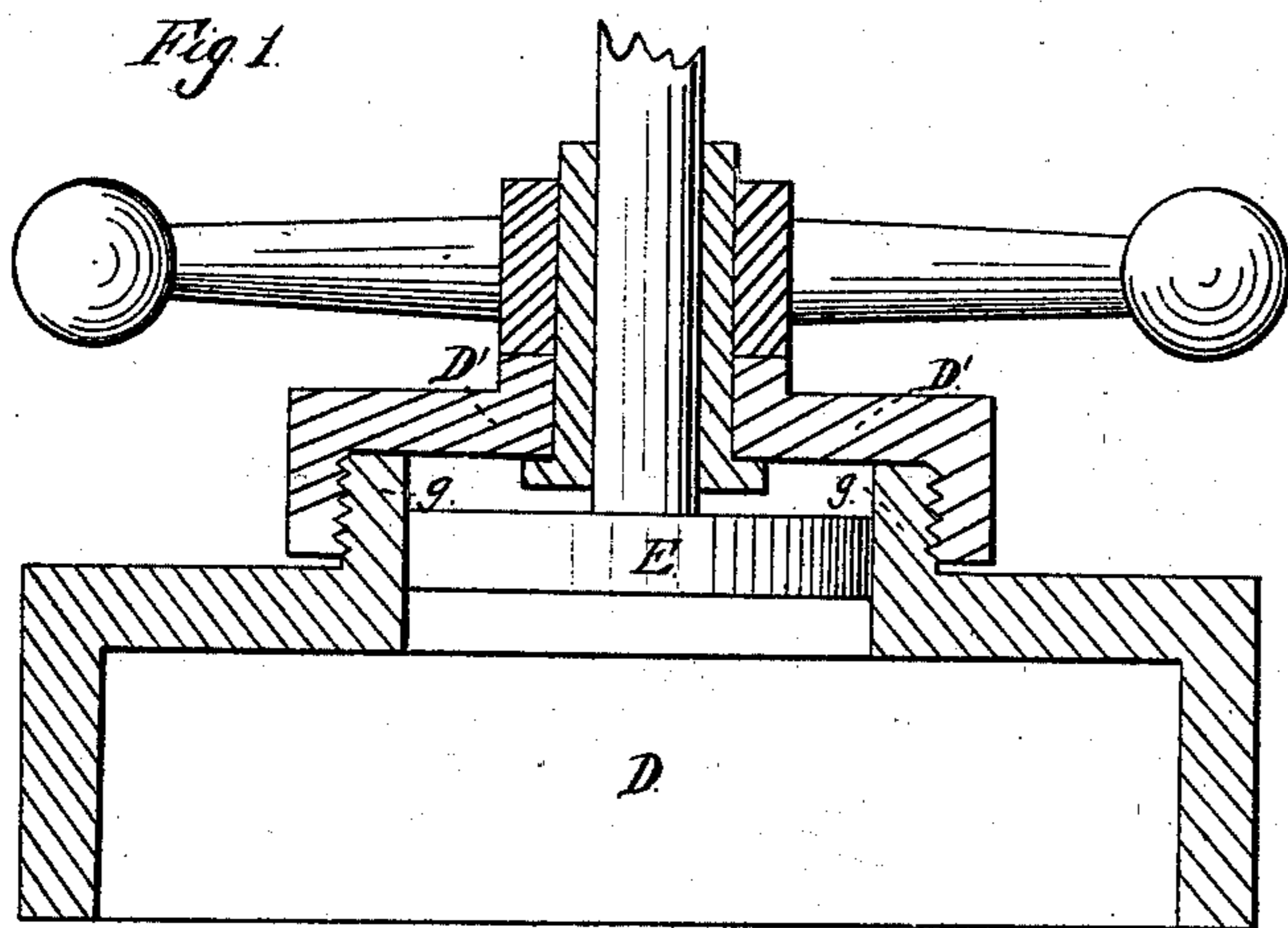


Fig 2.

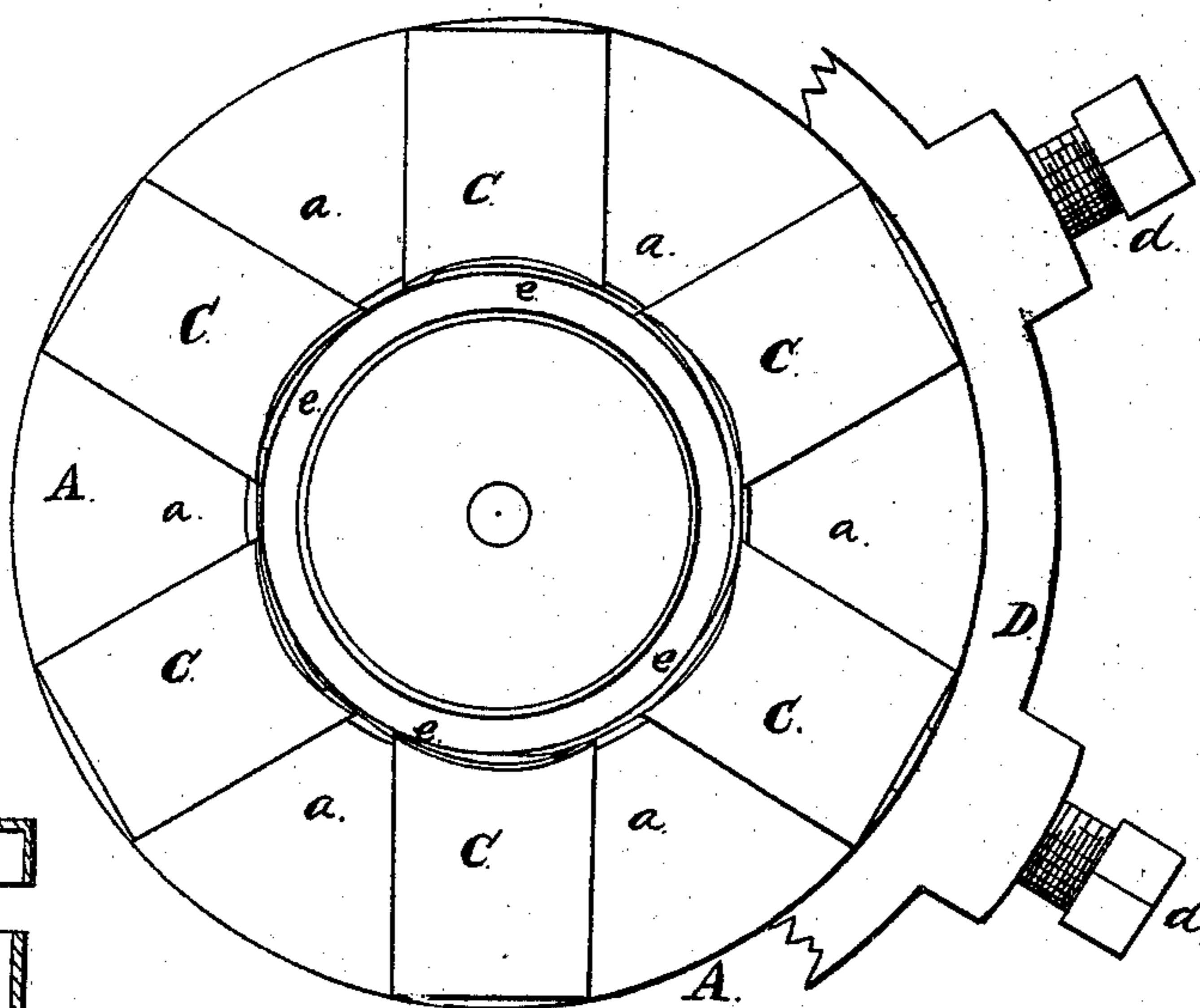


Fig 4.

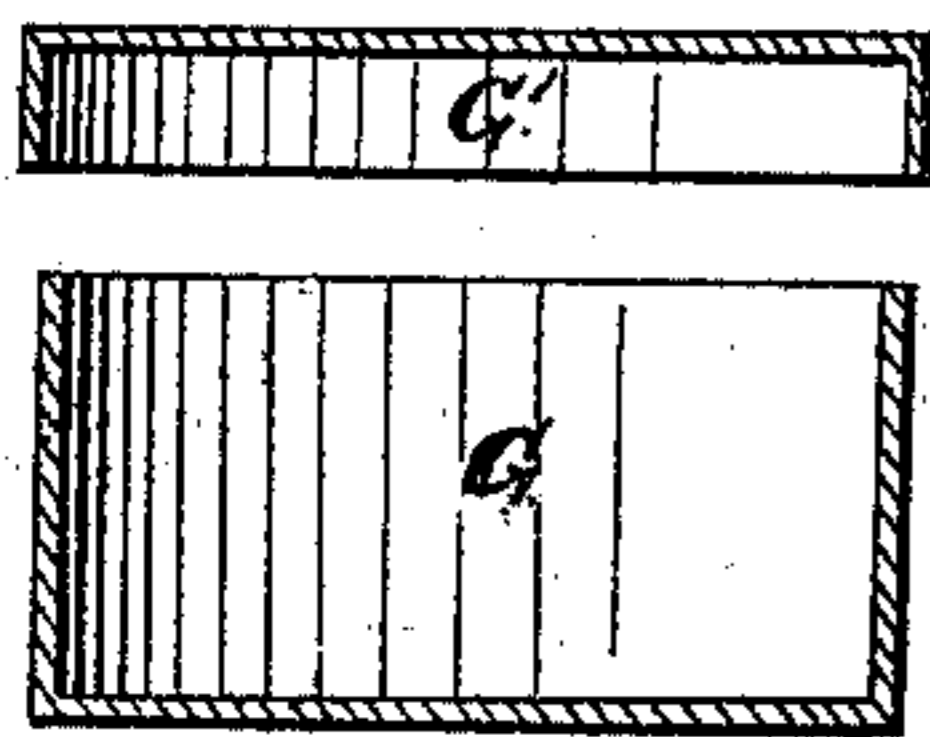
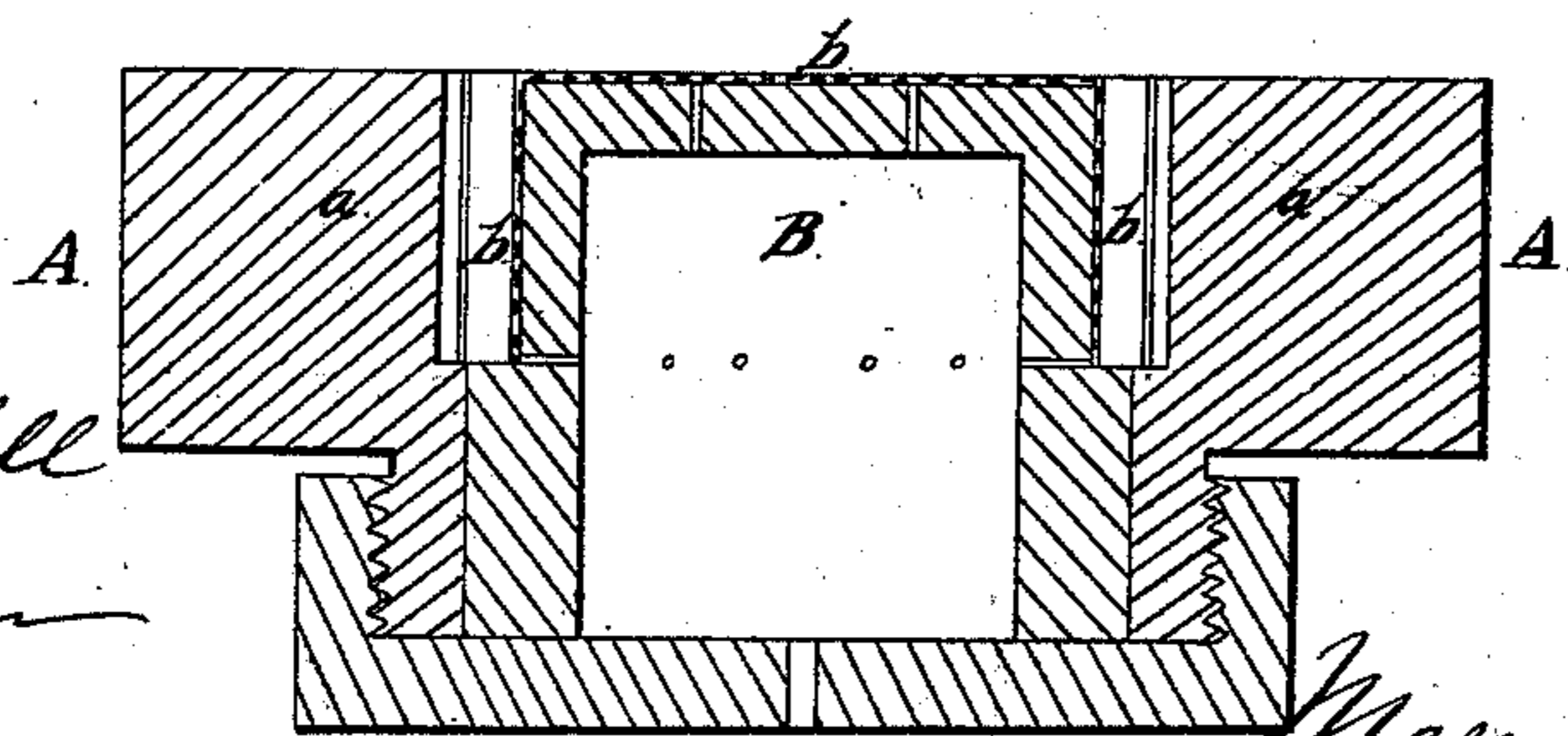


Fig 3.



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IMPROVEMENT IN THE MANUFACTURE OF PAPER BOXES.

Specification forming part of Letters Patent No. 61,968, dated February 12, 1867.

To all whom it may concern:

Be it known that we, SETH WHEELER and EDGAR JEROME, both of Albany, in the county of Albany and State of New York, have invented a Mode of Making Paper Boxes without a Joint; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figures 1, 2, and 3 represent parts of a machine which may be employed in constructing the improved paper boxes. Fig. 4 is a central section through the body of a paper box and its cover, which are produced without a seam or joint.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to produce paper boxes of various sizes and shapes without seams or joints, by molding the paper-pulp into the required form by suitable machinery adapted to the purpose, thereby making such boxes much stronger and more durable than paper boxes which are prepared from paper cut in several pieces and cemented together, and at the same time effecting great economy in the use of paper, as will be hereinafter described.

The nature of our invention consists in providing means for making hollow paper articles—such as boxes, with or without tops, lamp-shades, bags, loaf-sugar covers, fruit and honey baskets, and other analogous receptacles for various articles of merchandise—the said means operating upon a mass of paper-pulp, and at one time both expressing the moisture from the pulp and giving the desired form and solidity to the articles produced therefrom.

The principle of operation pursued by us is that of pressing the pulp between dies, which are constructed so as to allow of the free expulsion of the water from the pulp simultaneously with the impartation of form and solidity thereto.

This principle of operation we believe to be new, for, so far as we are aware, it has been usual heretofore, in the manufacture of trays and other articles from papier-maché by means of dies, to first express the water from the substance between screens, and then to place

the sheets between the dies. But this tedious and expensive mode is not necessary when paper-pulp boxes and other hollow articles are made upon a former which allows for the ready escape of the water from the pulp, and hence attempts have been made to avoid the practice of first drying, and then pressing the paper mass into form; and to this end Mr. Edward H. Knight invented and patented, in 1866, a pneumatic process for making hollow paper articles. His process may be a very useful one, as far as it goes; but we believe our mechanical means, or mechanical-pressure process, will be found far better adapted for making hollow articles at one operation, with any desired thickness of pulp in their walls or sides.

To enable others skilled in the art to understand our invention, we will describe its construction and operation.

In the accompanying drawings we have illustrated one form of machine which may be used for making seamless paper boxes; but we contemplate making the boxes by machinery which shall be automatic in its movements, so as to produce the boxes very rapidly.

A represents the body of the machine, which consists of a number of upright segments, *a a*, projecting a suitable distance above a bed-plate, and arranged at regular distances apart around a common center. There is a circular opening through A for the reception of a hollow form, B, the circumference of which may be corrugated, so as to form water-channels, and adapted for receiving around it a plate of perforated sheet metal or other rigid material, *b*. A similar metal plate covers the top of said former, as shown in Fig. 3. This hollow former is perforated at suitable points, for the purpose of allowing the water which is pressed from the paper-pulp to escape freely through the perforated plates *b*.

The cylindric metal frame is split down at one point, so as to be expanded or contracted, and the body portion is removable with paper box formed on it.

Between the segments *a a* surrounding the former B are follower-blocks O O, which are free to slide outward and inward, and which are moved in this manner by means of screws *d d*. (Shown in Fig. 2.) These screws *d* are tapped

through a case or jacket, D, which is shown in Fig. 1 in section, and which, when it is in place, incloses the body of the machine.

There are spring-plates *e e* interposed between the ends of the followers C C and the circumference of the perforated plate *b*, which springs are made thin, and arranged so that their ends lap over each other and close the spaces between the inner ends of the segments *a*, as shown in Fig. 2. Said springs constitute the outer compressing-wall, and they are so applied to the followers C C as to move with them.

A large opening is made through the center of the cap or case D, surrounding which is a flange, *g*. Within this flange a piston, E, is applied, so as to move up and down freely, but tightly. A cap, D', is screwed over the flange *g*, through the center of which the piston-rod passes.

By unscrewing cap D' and removing the piston E, access can be had to the space surrounding the former B for the introduction of the paper-pulp around the sides and on top of the former.

The pulp having been introduced into the machine, and the cap D' with its plunger applied, this plunger or piston E, together with the followers C C, are forcibly moved toward the former, so as to compress the pulp and force all the water out of it.

A sufficient pressure having been applied to the paper-pulp, the followers C C C are drawn outward and the case D removed, to allow of the removal of the box, which will be formed of one piece of paper, with sharp and perfect edges, as represented in Fig. 4.

The cover or top G' of the box G may be made in a similar manner to that above described—viz., by compressing and condensing paper-pulp about a suitable form.

It will be obvious from the above description that paper boxes of various forms and sizes may be molded from paper-pulp, so as to be seamless, by a slight modification in the form of the machine described.

We do not confine our invention to machinery for making paper boxes directly from the pulp by mechanical pressure applied through dies, as other machinery than that herein described, but operating on the same principle as that herein set forth, may be employed for the purpose; and our object in illustrating the within-described machine was merely to show one practical mode of producing the boxes.

As one modification of the means shown for moving the laterally-pressing followers, I shall adopt the well-known circle-plate, with oblique slots in it, used on lathes and other machinery for moving in and out the tapping-dies, tenon-cutters, and other tools. This

circle-plate will receive the ends of the followers, or the pins on the followers will enter the oblique slots of the face-plate, and by turning this plate to the right and left the followers will be forced inward and drawn outward.

We shall connect the circle-plate to the machinery which operates the vertically-moving follower, so that the descent or ascent of this follower shall operate the laterally-pressing followers; or, if preferred, the circle-plate may be operated by a treadle, or independently of the devices which actuate the vertically-moving followers. And, instead of this particular circle-plate, a ring with cams on its inner circumference may be made to operate the laterally-moving followers. This ring may be operated vertically or horizontally, accordingly as its cams are set or shaped.

As another modification, we shall provide an inner and outer perforated flask, and between these two flasks introduce a follower, which acts upon the upper edge of the pulp, thus making the body of the box by end pressure alone.

We have tried various plans, in all of which the two functions of expressing the water from, and giving form to, the pulp by means of dies, and at one operation, were performed.

We propose to make open-work, ornamental, and illuminated hollow articles, as well as articles with closed walls or sides.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. In the manufacture of hollow paper articles directly from paper-pulp by mechanical pressure, means, substantially as described, whereby the water is allowed to escape freely and form is given to the pulp at one operation, as set forth.

2. The combination of vertical and horizontal followers in a machine adapted for making paper boxes and other hollow articles from pulp, substantially as and for the purpose described.

3. The combination of a perforated die and a follower or followers in a machine adapted for making paper boxes from pulp, substantially as described.

4. In a machine adapted for making paper boxes and other hollow articles, the use of a light rigid frame, upon or within which the article of pulp is formed, said frame being removable from the dies, substantially as and for the purpose set forth.

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