

No. 751,300.

PATENTED FEB. 2, 1904.

W. M. KINNARD.  
MACHINE FOR MANUFACTURING VESSELS OF PAPER OR OTHER  
FIBROUS MATERIAL.

NO MODEL.

APPLICATION FILED MAY 3, 1901.

2 SHEETS—SHEET 1.

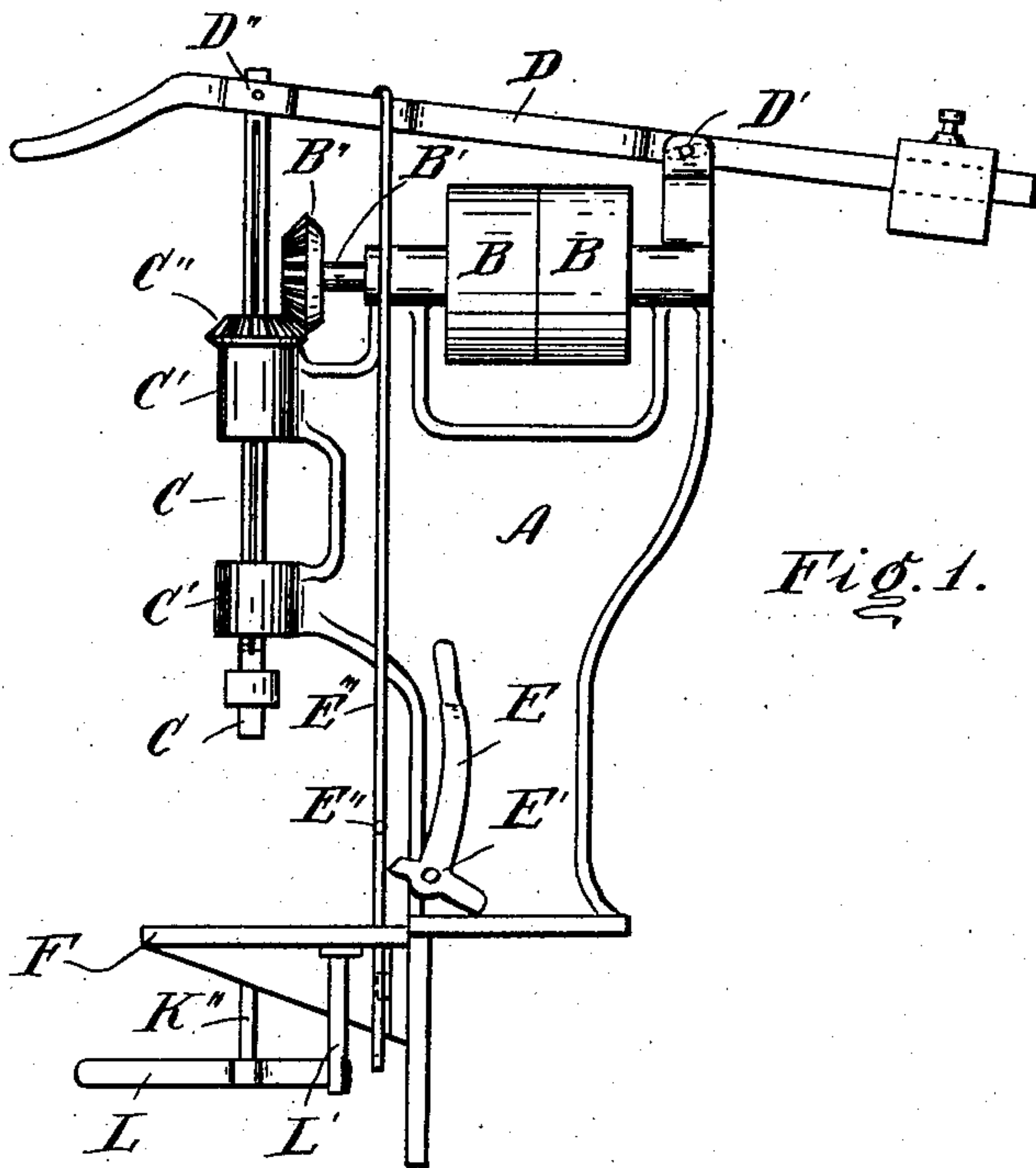


Fig. 1.

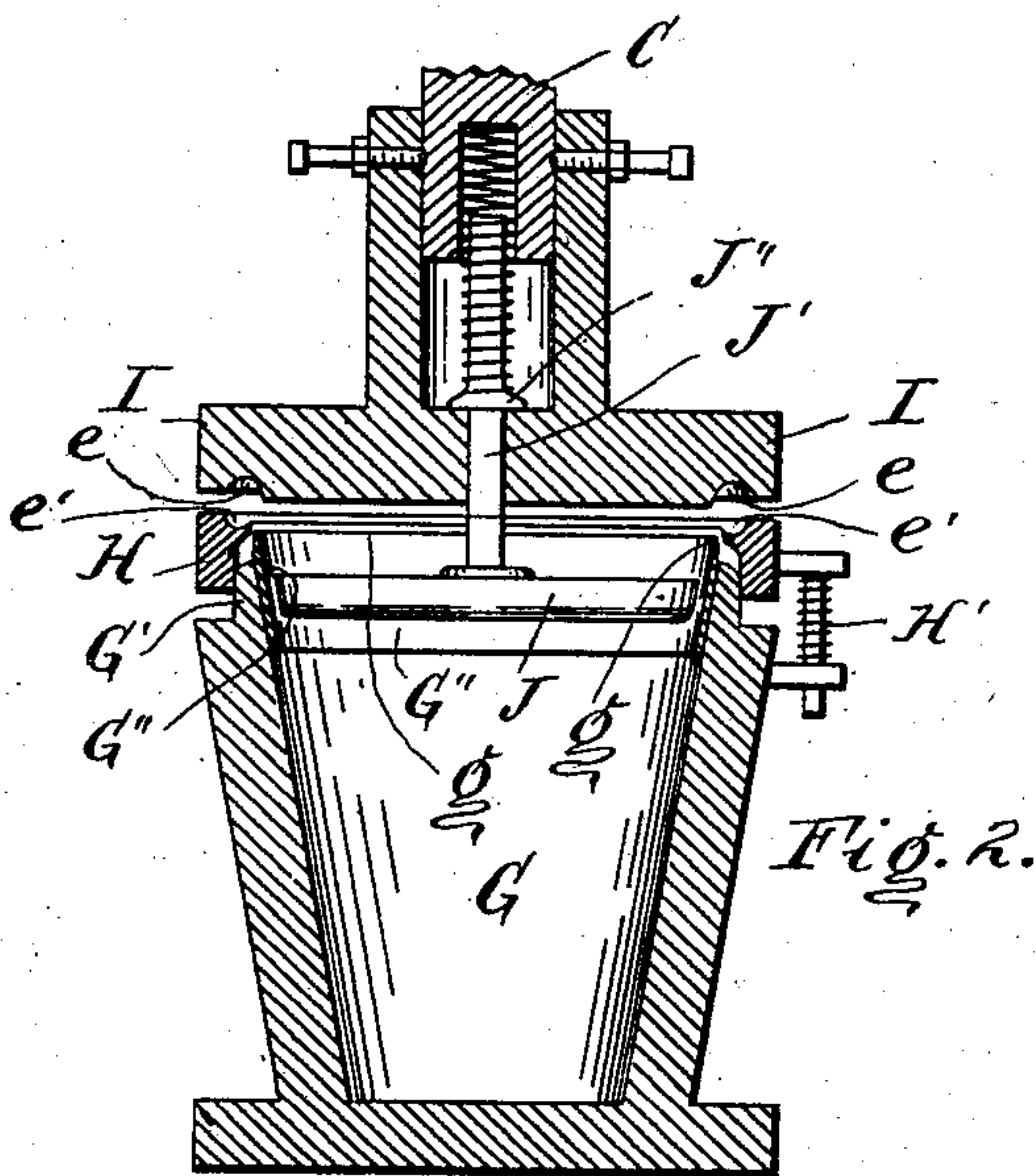


Fig. 2.

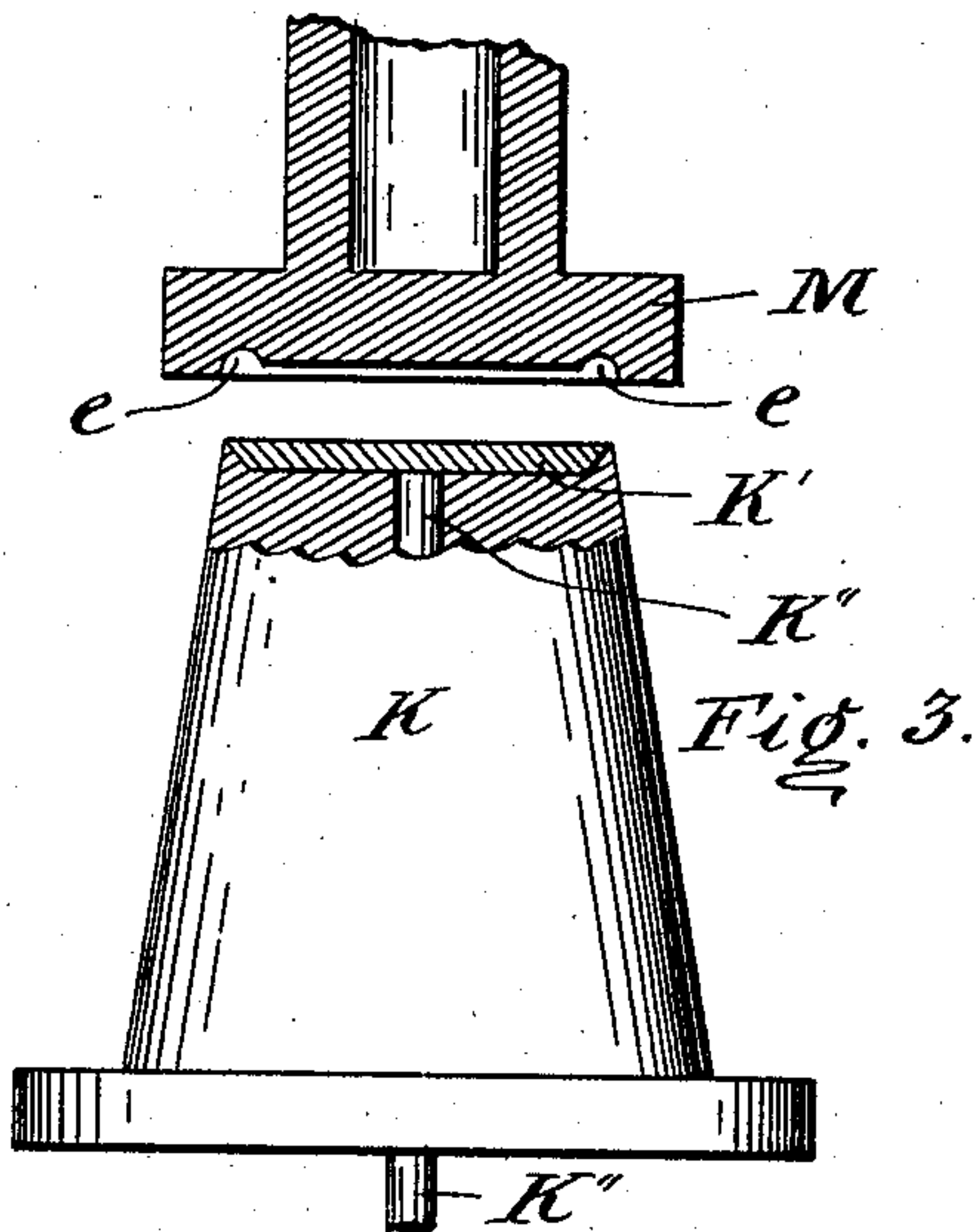


Fig. 3.

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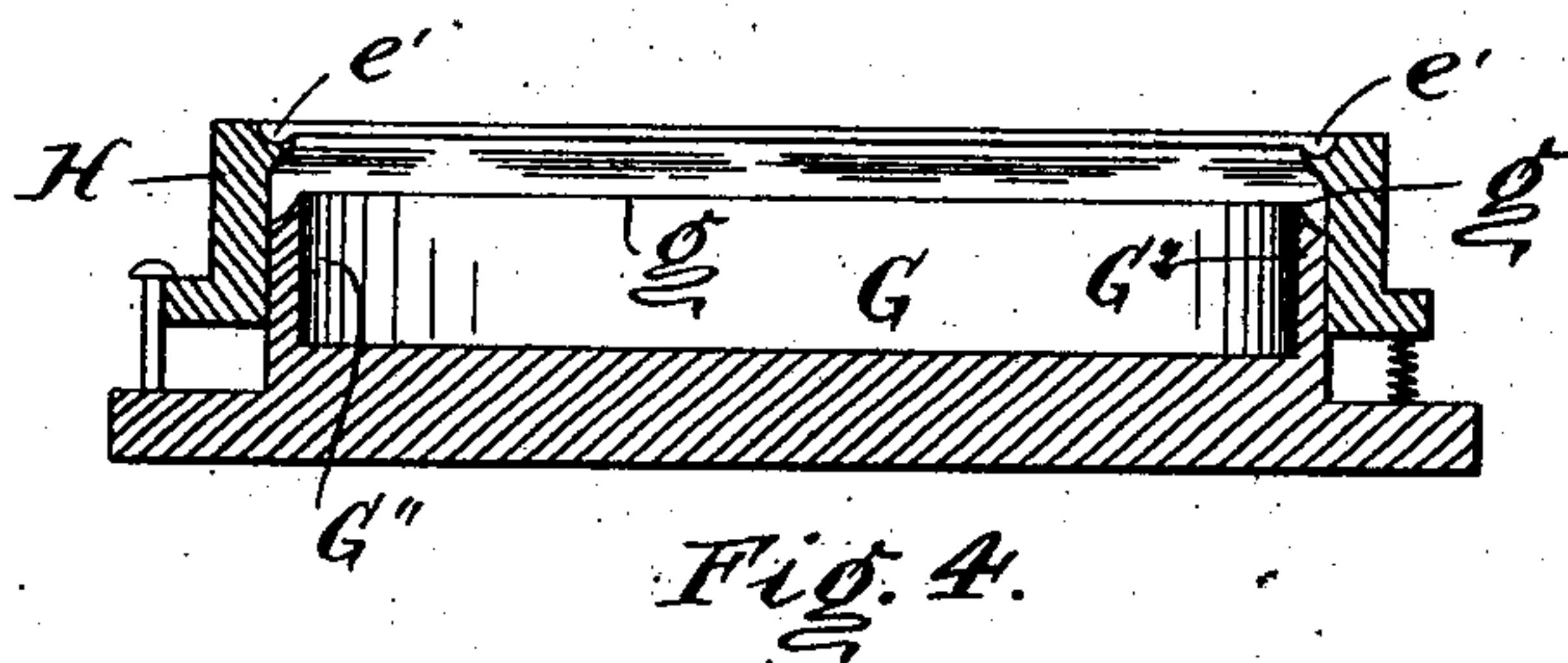


Fig. 4.

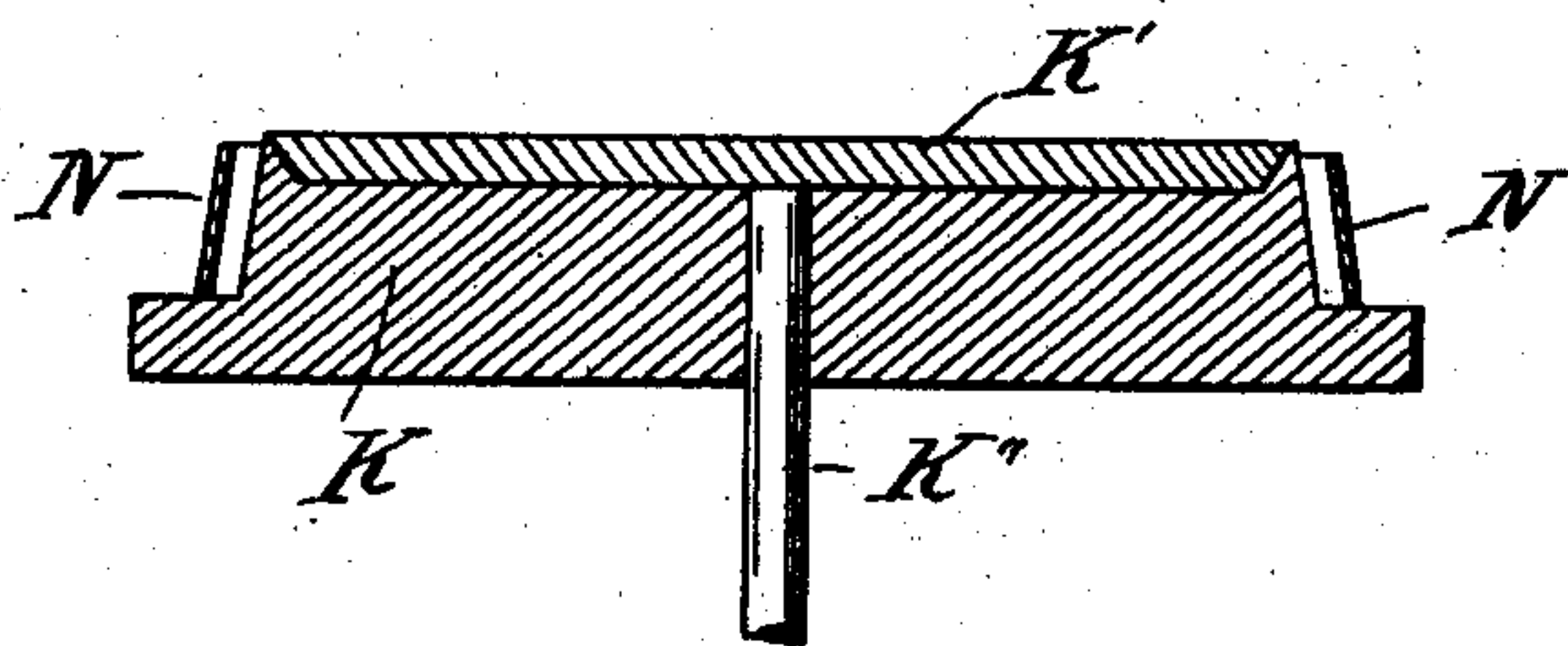


Fig. 5.

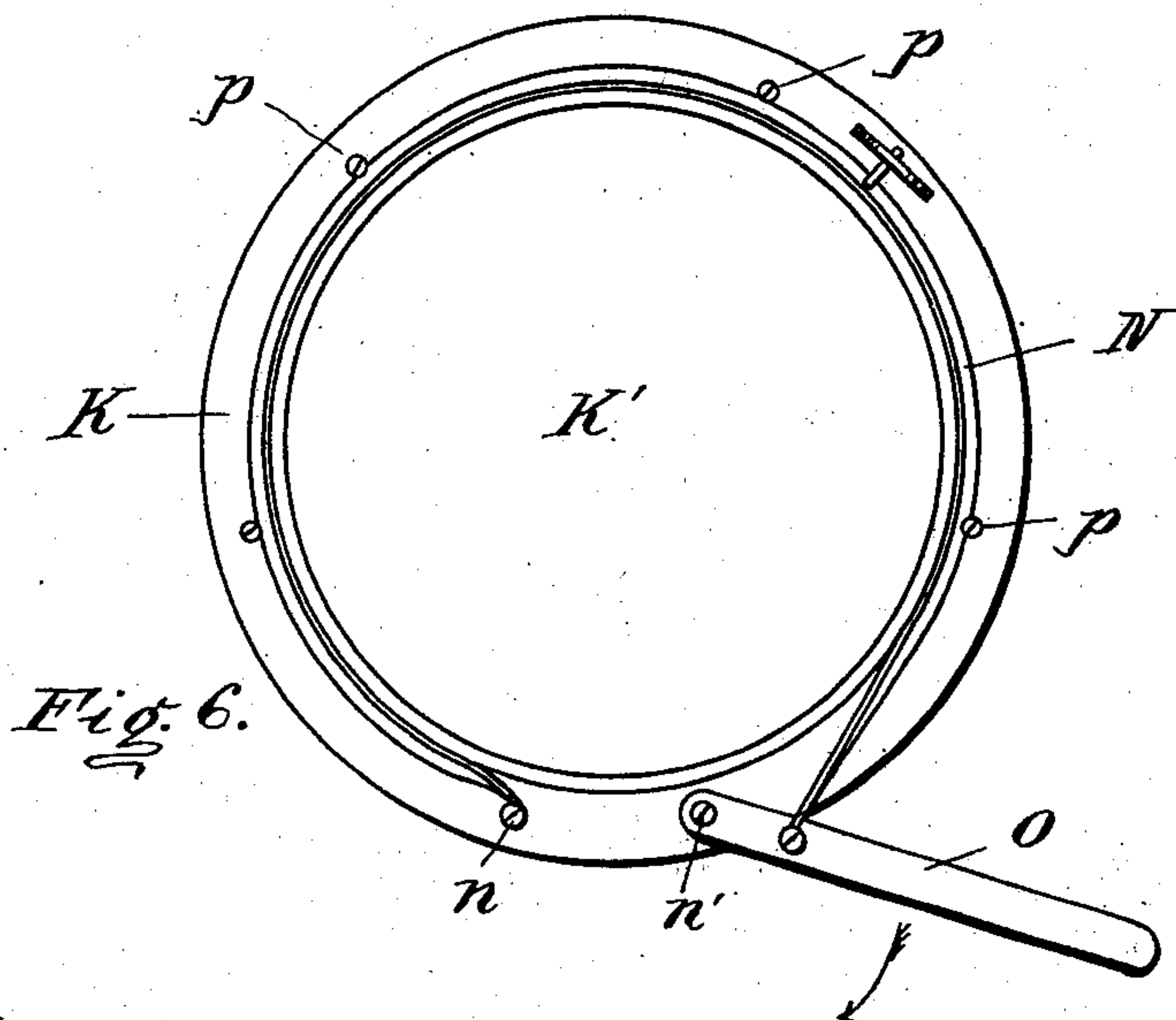


Fig. 6.

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# UNITED STATES PATENT OFFICE.

WILL M. KINNARD, OF DAYTON, OHIO.

MACHINE FOR MANUFACTURING VESSELS OF PAPER OR OTHER FIBROUS MATERIAL.

SPECIFICATION forming part of Letters Patent No. 751,300, dated February 2, 1904.

Application filed May 3, 1901. Serial No. 58,656. (No model.)

*To all whom it may concern:*

Be it known that I, WILL M. KINNARD, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have invented a certain new and useful Improvement in Machines for Manufacturing Vessels of Paper or other Fibrous Material, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form part of my specification.

My invention relates to machines for manufacturing vessels from paper or other fibrous material.

The purpose of my improved machine is to form a stiffening-bead at the edge of a vessel or pail, either top or bottom. The bead is formed by curling, rolling, or spinning the comparatively thin walls of the vessel outwardly or inwardly upon themselves.

In the drawings like letters of reference indicate like parts of the machine.

Figure 1 is a side elevation of the machine for operating my improved bead-forming mechanism. Fig. 2 is a section of the mechanism for applying a bead to the top of a pail or vessel. Fig. 3 is a partial section of the mechanism for applying a bead to the bottom of a pail or vessel. Fig. 4 is a section of the mechanism for applying a bead to the top of a shallow dish or lid. Fig. 5 is a section of the mechanism for applying a bead to the bottom of a shallow dish or lid, and Fig. 6 is a plan view of Fig. 5.

My improved machine is for use in the manufacture of paper vessels such as described in Letters Patent No. 631,852 granted to me and is adapted to form the stiffening-bead at the top and bottom, either or both, of a vessel of the kind described in my application for a process patent Serial No. 14,551.

My improved mechanism is mounted on and operated by a machine similar to an ordinary drill-press, as shown in Fig. 1, in which A is the standard, B B the driving-pulleys operating the shaft B', to which is keyed the bevel-gear B''. A plunger C is suitably mounted in vertical bearings C' and is feathered to a bevel-gear C'', which engages the bevel-gear

B''. A weighted lever D, pivoted to the standard at D' and rotatably pivoted to the plunger C at D'', serves to raise or lower the plunger C, as desired. As the lever D is usually above the head of the operator, an auxiliary lever E is pivoted to the standard at E' and in conjunction with a lug E'' upon a rod E''', whose upper end is attached to the lever D, serves to pull down the plunger from a position where the operator can exert more force. A standard F, capable of vertical adjustment, serves to hold the receptacle which contains the partially-formed vessel that is to be operated upon. Thus far the mechanism described is old and well known and forms no part of my invention.

For applying a stiffening-bead at the upper edge of a deep pail or vessel the mechanism shown in Fig. 2 is used. G is a bowl or receptacle for holding the pail or vessel while the bead is being formed, which is bolted to the standard F, so that its axis will coincide with the axis of the plunger C. The bowl G has an annular flange G', upon which loosely fits a sliding ring H. The ring H is yieldingly supported in any convenient manner against the main body of the bowl G—as, for example, by means of pins and coil-springs H', disposed at equal distances about the periphery of the ring. An inner flange G'', projecting slightly above the outer flange G', is secured to the inner surface of the bowl G and is provided with a sharp edge *g*. The inner flange G'' may be made in one piece with the outer flange G'; but I prefer to make it removable for convenience in sharpening in case it is dulled by use. The ring H is provided with an annular groove *e'*, which is helical in cross-section. A former or die I, provided with an annular groove *e*, helical in cross-section, (the helix of groove *e* being a continuation of the helix of groove *e'* in the ring H,) is attached to the plunger C by means of set-screws and is rapidly rotated thereby. A vessel to be operated upon is placed in the bowl G, with its edges projecting slightly above the ring H. By means of the levers D and E the plunger carrying the rotating former or die I is brought down grad-



ually against the projecting edges of the vessel. The groove *e*, catching said edges, causes them to begin to curl and to assume the helical shape of its own section. The die I continues to descend, striking the ring H and compelling the projecting edge of the vessel to follow the section of the groove *e'* until the ring H is forced down below the edge of the inner flange or tucker G'', whereupon the curling process is assisted by said flange G'', tucking under the edges and curling the edges still further, thereby forming a tight and almost solid bead. To prevent the vessel from rotating under the action of the rotating die, the die is provided with a pilot J, which is simply a disk of the size of the inner diameter of the vessel adapted to wedge itself against the inner walls of the vessel. Said pilot J is secured to a rod J', yieldingly mounted in any convenient manner in the die I, as shown, and prevented from falling by means of a shoulder J''.

When it is desired to form a bead at the top of a shallow dish or lid, the receptacle shown in Fig. 4 is used. This is shallower, but otherwise is of the same general construction and operates in the same manner as that described. The inner flange or tucker G'' is made in one with the outer flange and not separably, as described before. The die I is used with this, as before.

When it is desired to form a bead at the bottom of a vessel or pail where the edge is curled inward instead of outward, the mechanisms shown in Figs. 3, 5, and 6 are used. K is the holder corresponding to the receptacle before, upon which the vessel is held while the bead is being formed. A beveled disk K' fits loosely in the top of said holder and is mounted on a rod K'', adapted to be raised and lowered by the operator by means of a lever L, pivoted to a downwardly-projecting bar L', secured to the standard F. (See Fig. 1.) A die or former M, provided with an annular groove *e*, is attached to the plunger C, as before. To form the bead, the vessel is placed upon the holder K with edges projecting above its top. By means of the lever L the disk K' is raised until it is on a level with the edge of the vessel. The rotating die M is now brought down gradually against the edges of the vessel. The groove *e* causes the edges to curl, as before, until the disk K' is forced by the die back to its normal position, when the edges will have been curled tightly upon themselves, forming an almost solid bead, as before. The purpose of the disk K' is to hold up the edges while they are being curled, thereby preventing the former or die M from breaking them.

The holder shown in Fig. 5 is for a shallow dish or lid and is used with a former M, as shown in Fig. 3. I find that it is necessary in this case to provide a flexible band N with

one end attached to a screw *n*, attached to the base of the holder K, and the other attached to a lever O, which is pivoted to the base of the holder K at *n'*. Screws *p p* at various points hold the band N in place. When a shallow lid or vessel is placed on the holder K, the lever O is swung about the point *n'* in the direction of the arrow, thereby bringing the band N to bear upon the vessel, preventing said vessel from rotating during the action of the die.

Having thus described my invention, what I desire to claim as new and to cover by Letters Patent is—

1. In a machine for making paper vessels, a vessel-retaining bowl, a rotary die whose axis is coincident with the axis of said bowl, and means whereby said die is brought into contact with the retaining-bowl, their coaction forming a stiffening bead or rim on said pail, substantially as shown and in the manner described.

2. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, a second die whose axis is coincident with the axis of said bowl, and means whereby said dies are brought together, the two coöperating to form a stiffening bead or rim on said vessel, substantially as shown and in the manner specified.

3. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, a second rotary die whose axis is coincident with the axis of said bowl, and means whereby said dies are brought together, the two coöperating to form a stiffening bead or rim on said pail, substantially as shown and in the manner described.

4. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, an inner flange adapted to project beyond said die when said die is depressed, a second die whose axis is coincident with the axis of said bowl, and means whereby said dies are brought together, the two coöperating with said inner flange to form a stiffening bead or rim on said vessel, substantially as shown and in the manner described.

5. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, an inner flange adapted to project beyond said die when said die is depressed, a second rotary die whose axis is coincident with the axis of said bowl, and means whereby said dies are brought together, the two coöperating with said inner flange to form a stiffening bead or rim on said vessel, substantially as shown and in the manner described.

6. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, a second die whose axis is coincident with the axis of the said bowl, a pilot yieldingly mounted in advance of said second die, and means whereby said pilot is caused



to enter said bowl, and whereby said dies are brought together, the two dies coöperating to form a stiffening bead or rim on said vessel, substantially as shown and in the manner described.

7. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, an inner flange adapted to project beyond said die when said die is depressed, a second die whose axis is coincident with the axis of said bowl, a pilot yieldingly mounted in advance of said second die, and means whereby said pilot is caused to enter said bowl, and whereby said dies are brought together, the two dies coöperating with said inner flange to form a stiffening bead or rim on said vessel, substantially as shown and in the manner described.

8. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, an inner flange adapted to project beyond said die when said die is depressed, a second rotary die whose axis is coincident

with the axis of said bowl, a pilot yieldingly mounted in advance of said second die, and means whereby said pilot is caused to enter said bowl and whereby said dies are brought together, the two dies coöperating with said inner flange to form a stiffening bead or rim on said vessel, substantially as shown and in the manner specified.

9. In a machine for making paper vessels, a vessel-retaining bowl, a die yieldingly mounted thereon, a second rotary die whose axis is coincident with the axis of said bowl, a pilot yieldingly mounted in advance of said second die and means whereby said pilot is caused to enter said bowl and whereby said dies are brought together, the two dies coöperating to form a stiffening bead or rim on said vessel, substantially as shown and in the manner specified.

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Witnesses:

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