

(No Model.)

3 Sheets—Sheet 1.

W. S. SHOTWELL.  
WOODEN DISH MACHINE.

No. 420,363.

Patented Jan. 28, 1890.

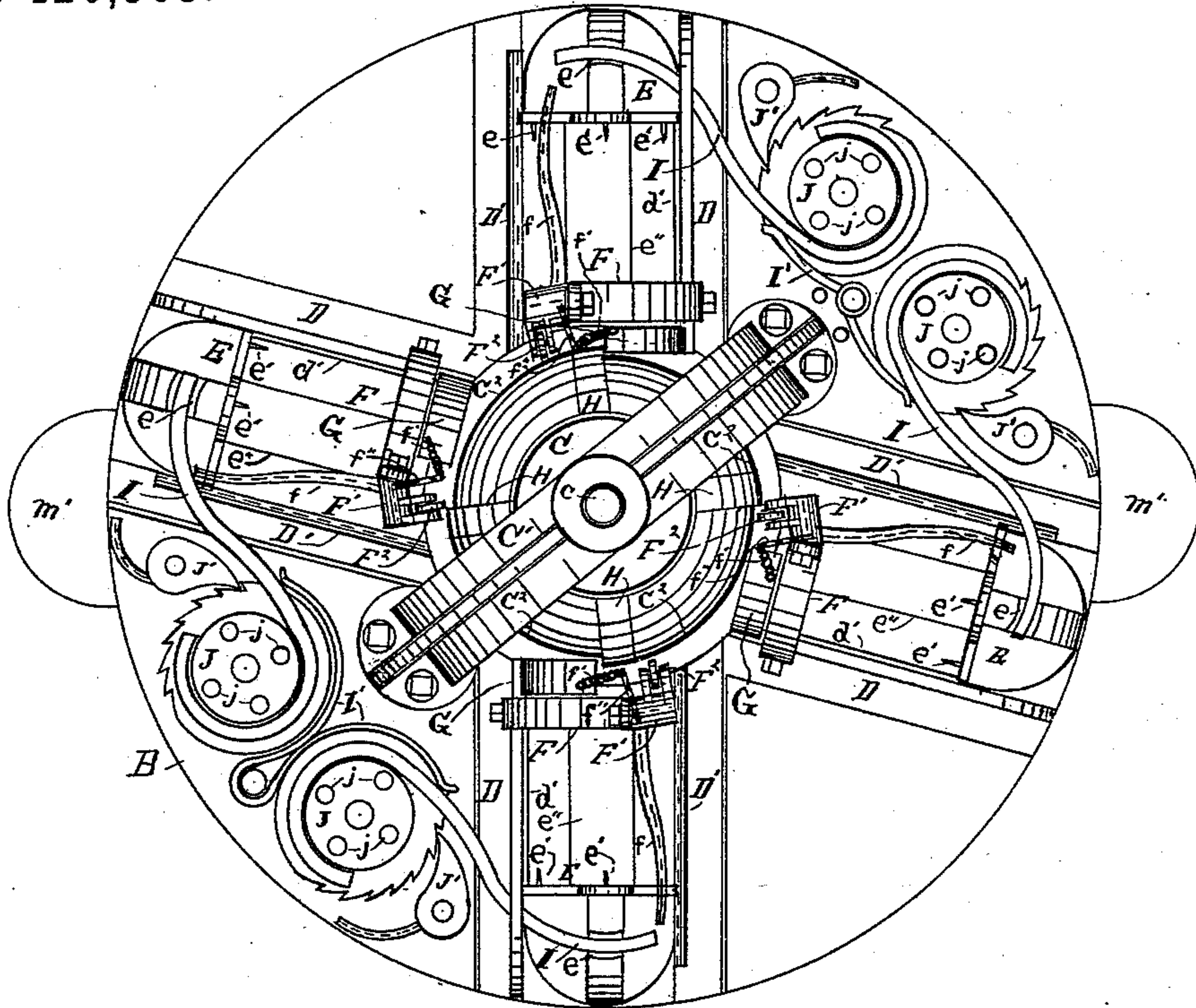


Fig. 1.

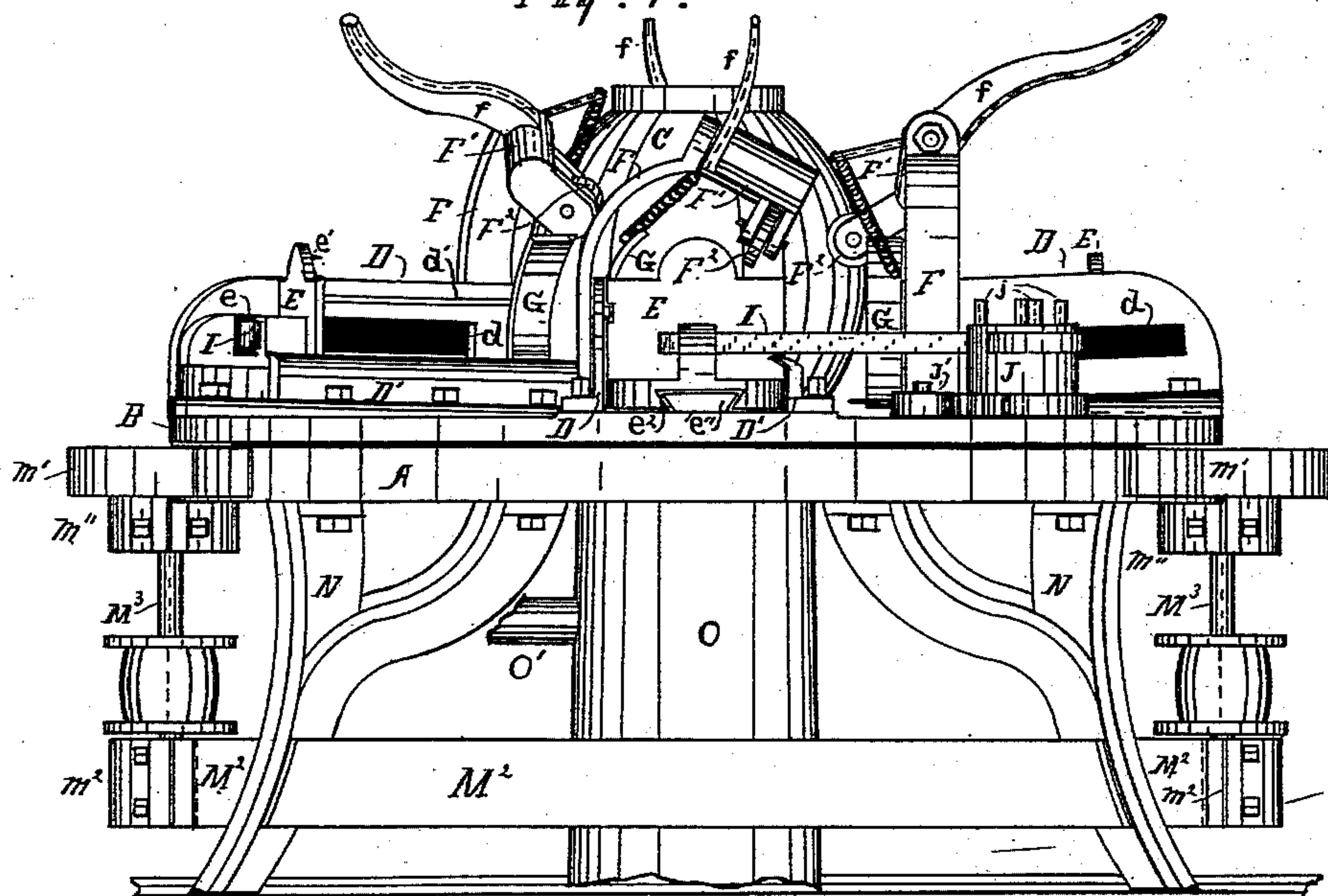


Fig. 2.

WITNESSES:

George H. White

C. Marsman.

INVENTOR

Walter S. Shotwell

BY

Arthur J. Billy  
ATTORNEY.

(No Model.)

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*FIIY. 3.*

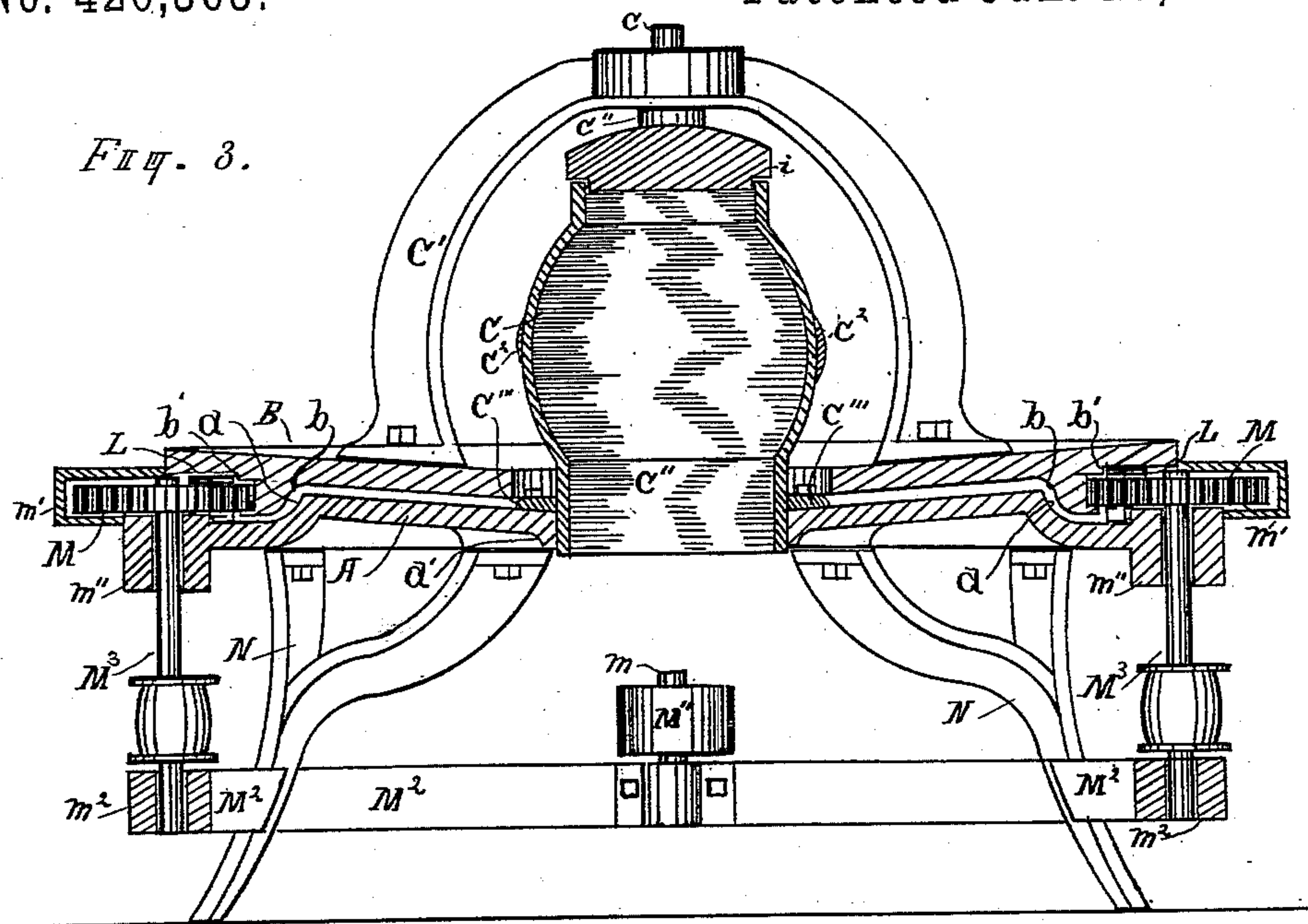
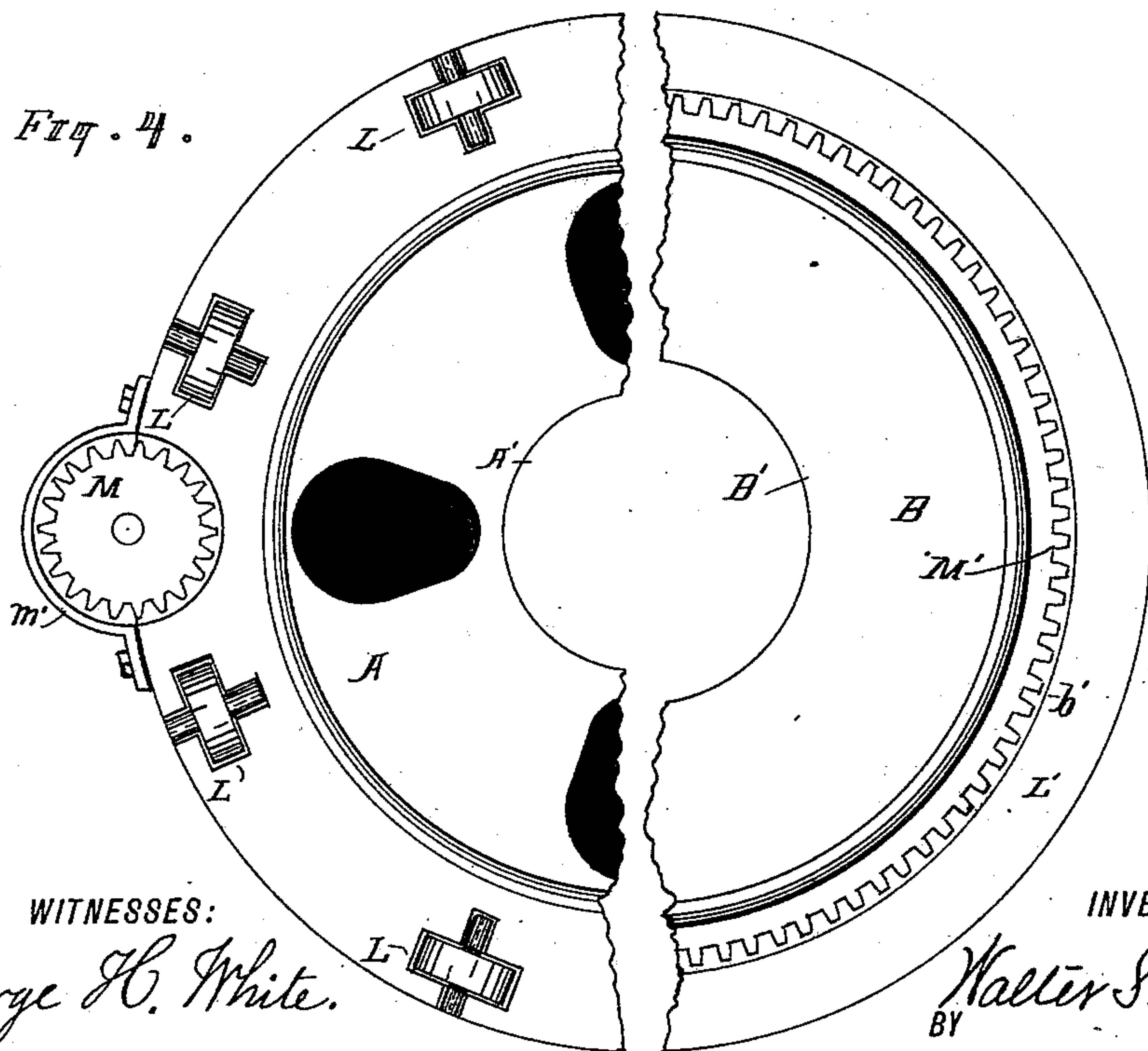


Fig. 4.



**WITNESSES:**

George H. White.

E Maassman

***INVENTOR***

Walter S. Shotton  
BY

BK

*John J. Billey*  
ATTORNEY.



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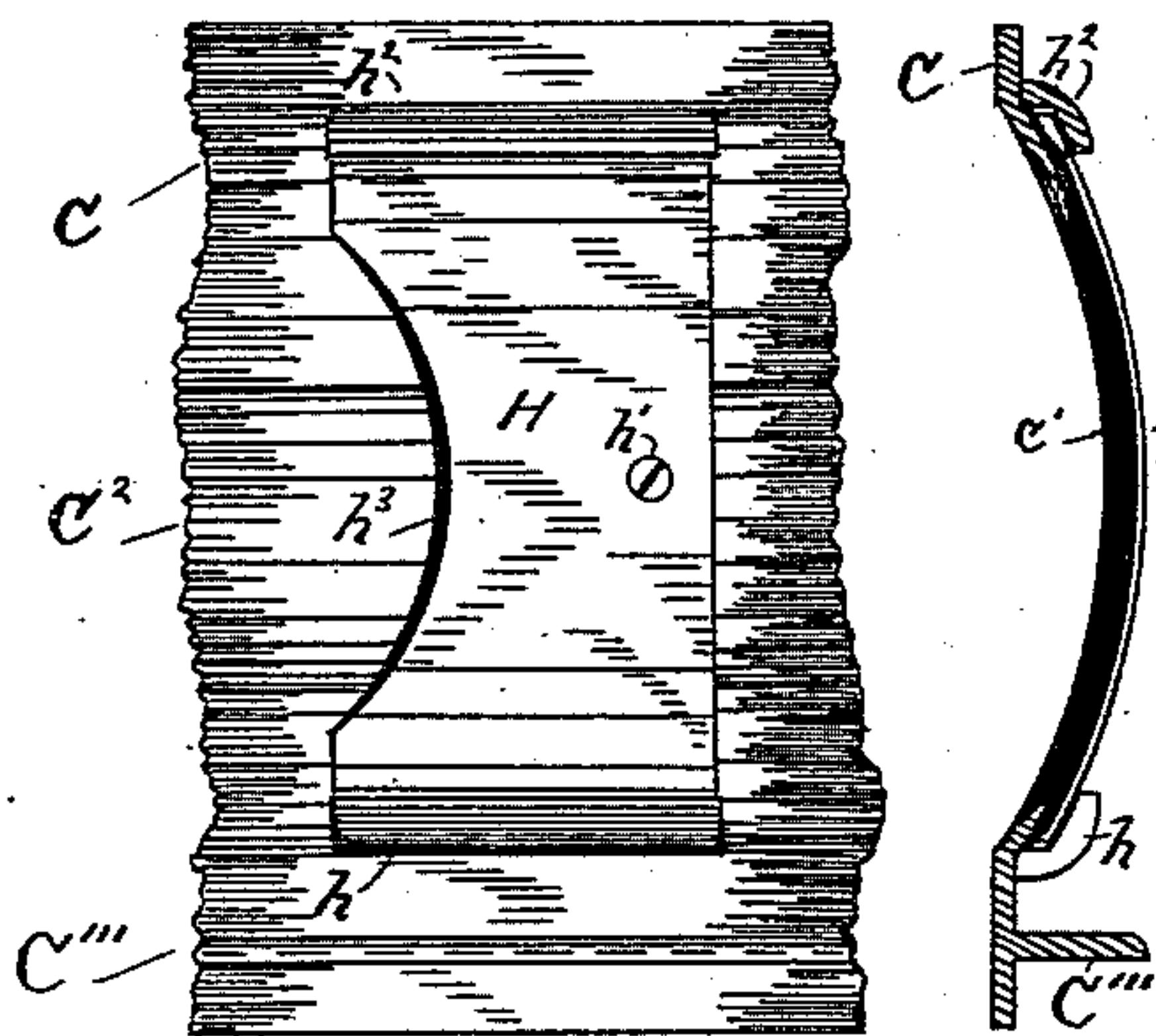


Fig. 5.

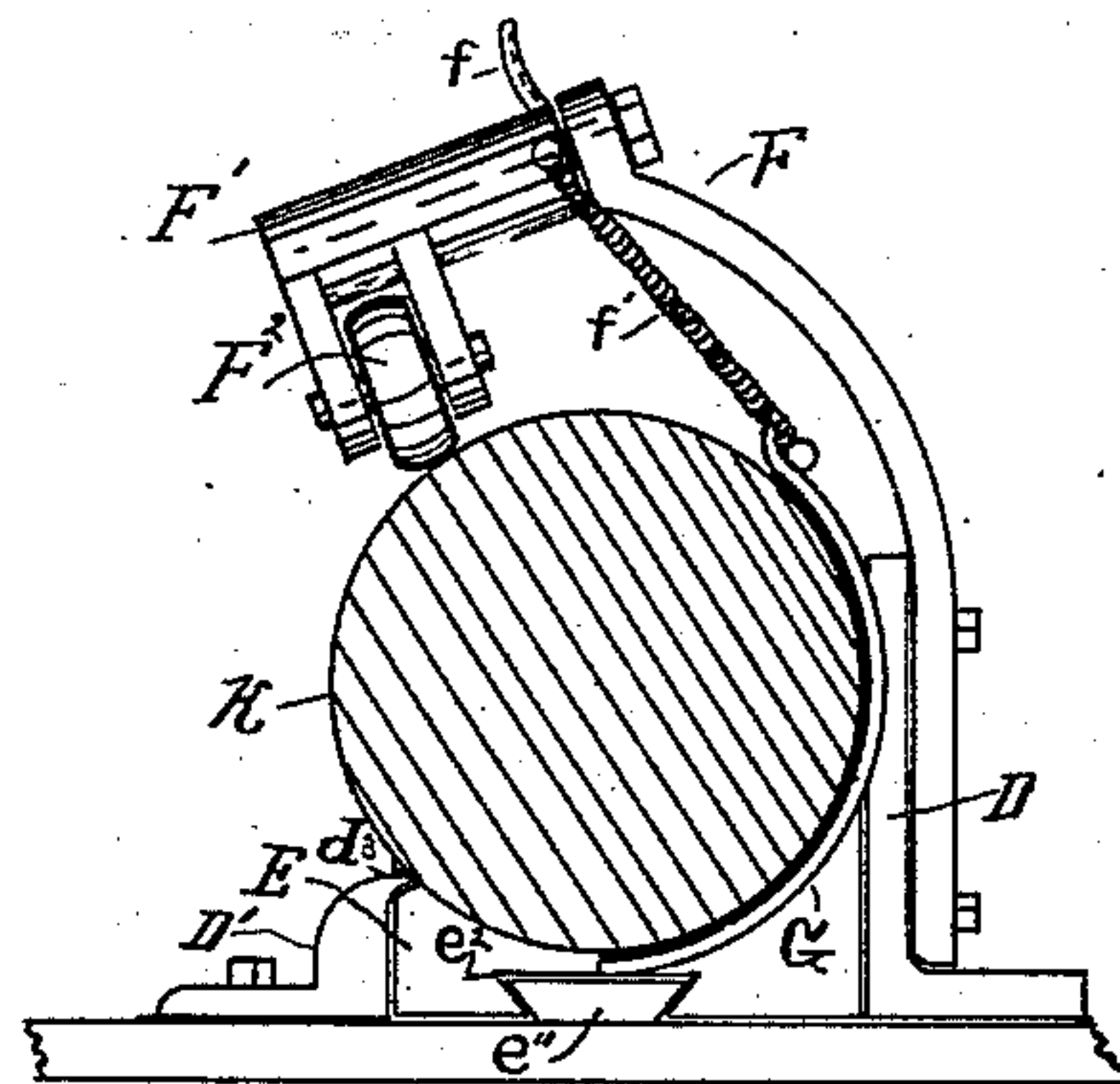


Fig. 6.

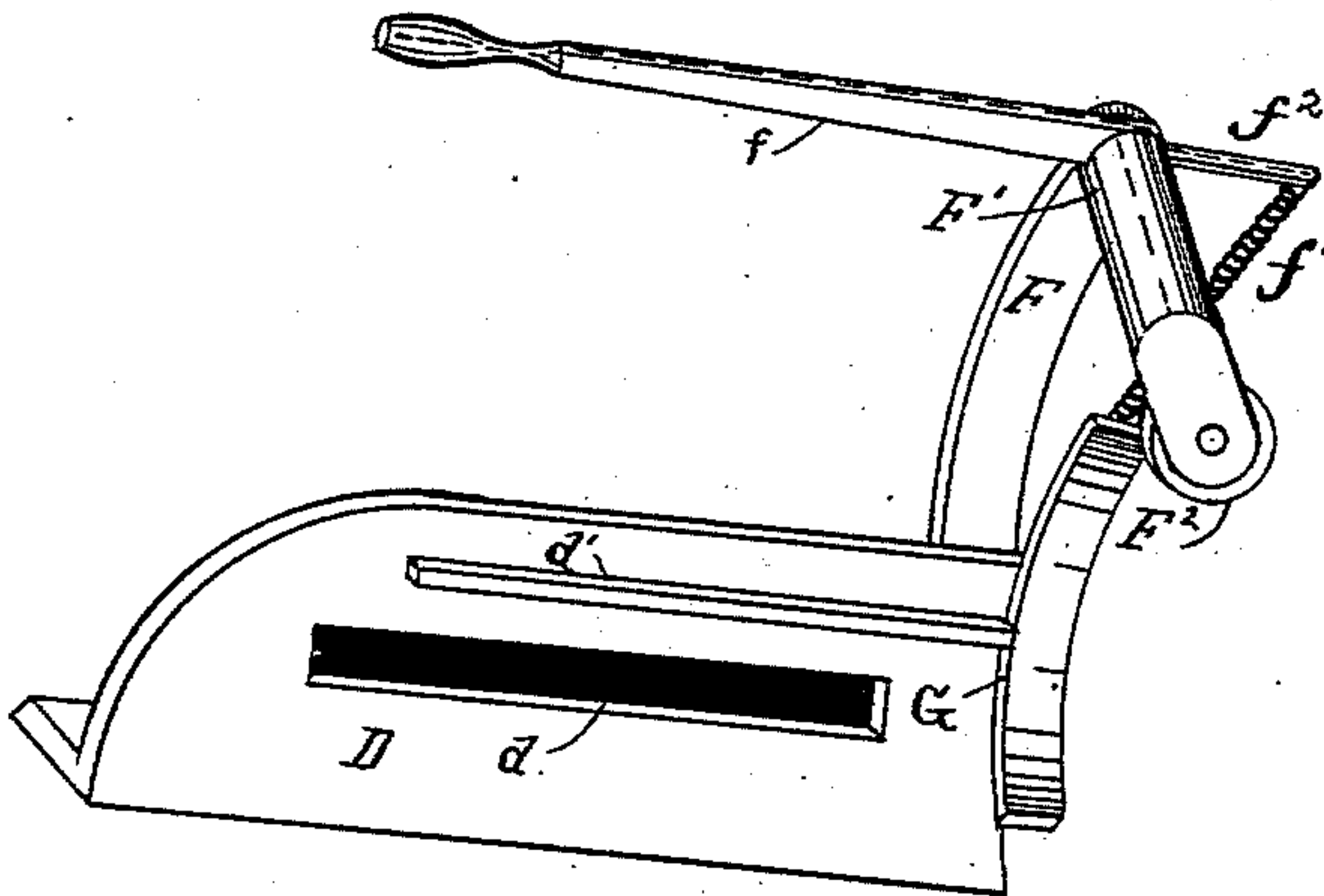


Fig. 7.

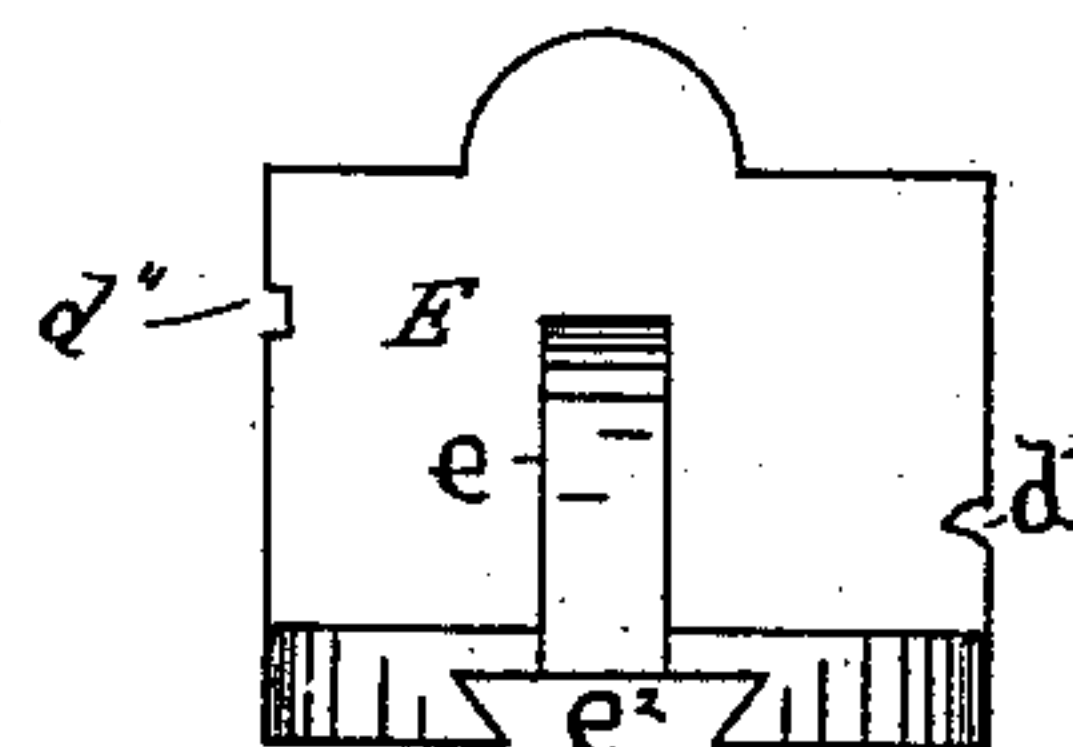


Fig. 8.

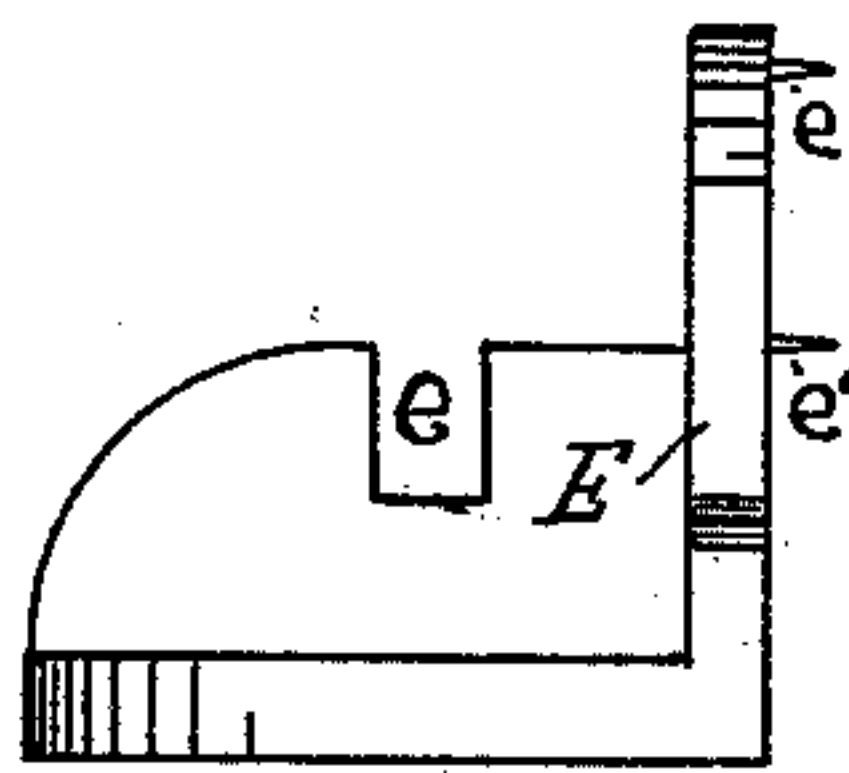


Fig. 9.

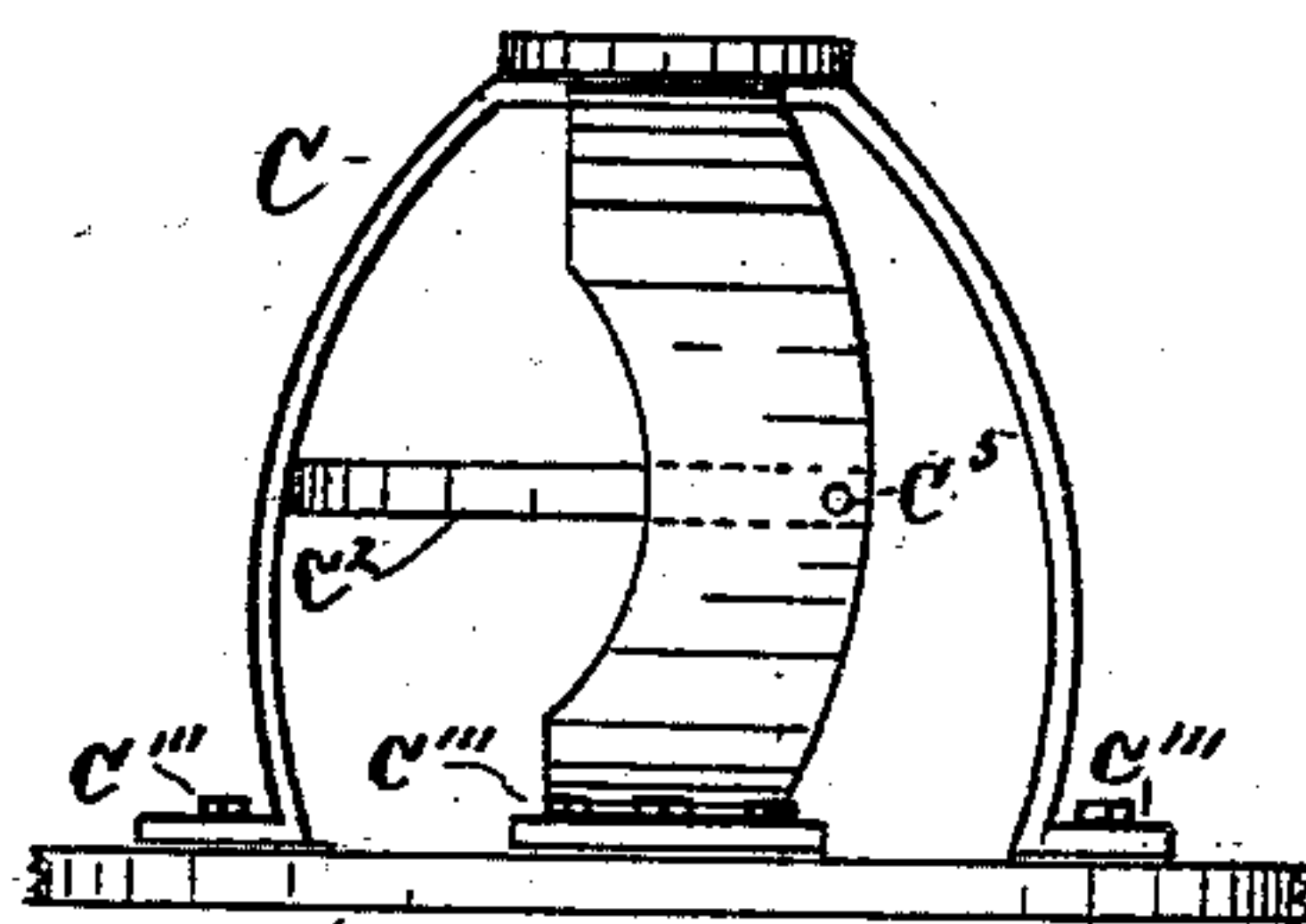


Fig. 10.

WITNESSES:

George H. White  
C. Mansman.

INVENTOR

Walter S. Shotwell

BY

Ethel J. Kelley  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

WALTER S. SHOTWELL, OF GRAND RAPIDS, MICHIGAN.

## WOODEN-DISH MACHINE.

SPECIFICATION forming part of Letters Patent No. 420,363, dated January 28, 1890.

Application filed September 27, 1889. Serial No. 325,311. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER S. SHOTWELL, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented a new and useful Machine for Manufacturing Wooden Dishes, of which the following is a specification.

My invention relates to an improved machine for manufacturing thin wooden plates such as are known as "grocers' butter-plates;" and the objects of my invention are, first, to provide a machine that will cut a series of dishes from a block of wood without the necessity of scathing or trimming the end of the block after cutting each successive dish; second, to provide a machine for which the blocks can be turned up to the form of the dish before manufacturing the dish; third, to provide a machine with which several blocks can be worked up into dishes at the same time and greatly facilitate the manufacture of wooden dishes. I accomplish these results by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a plan of the machine. Fig. 2 is an elevation of the same with the yoke C' removed. Fig. 3 is a vertical cross-section of the same with the guides D D' removed and the yoke C' in place. Fig. 4 is a plan of one-half of the upper side of the base and of the lower side of the table. Fig. 5 shows a section of the drum with a knife attached. Fig. 6 shows an elevation of the end of the guide next to the drum with a block in place. Fig. 7 is a side elevation of the same with the block removed. Fig. 8 is a front elevation of a carriage. Fig. 9 is a side elevation of the same, and Fig. 10 is a skeleton drum for holding the knives.

Similar letters refer to similar parts throughout the several views.

A is the base of the machine.

B is a revolving table.

45 C is a drum for supporting the knives.

C' is a yoke for steadying the table.

C<sup>2</sup> is a rib or guide for gaging the thickness of the dishes.

50 D, D', F<sup>2</sup>, and G are guides for holding the blocks in place and conducting them to the knives.

E is a carriage or slide for supporting the blocks and forcing them to the knives.

H H are the knives.

I I are springs for forcing the blocks 55 against the knives.

J J are standards with ratchets for supporting the springs.

J' J' are pawls for holding the springs in position. 60

K is a block of wood to be cut into dishes.

L L are anti-friction rollers for supporting and facilitating the movement of the table.

L' is a guideway on the lower side of the table for traveling over the rollers L. 65

M M are pinions for propelling the table.

M' is a series of gear-teeth attached to or formed upon the lower surface of the table and arranged to mesh with the pinions M for propelling the table. 70

M'' is an idler for carrying the slack of the belt that drives the pinions and giving it a proper bearing upon the pulleys.

M<sup>2</sup> M<sup>2</sup> are girts attached to the legs of the machine for strengthening the frame and supporting the idler and the lower ends of the pinion-shafts. 75

M<sup>3</sup> M<sup>3</sup> are the shafts that support and drive the pinions.

N N are the legs of the machine. 80

O is an escape-pipe through which the dishes pass from the knives to the storage-bin, and O' is an air-pipe leading from the pipe O to a blower for the purpose of producing a draft from the pipe O and the knife-drum to facilitate the passage of the dishes therefrom. 85

The base A may be circular in form, and is supported upon legs N, which are strengthened with girts M<sup>2</sup> in such a manner that the base will stand firmly in place. At one or more points in the rim of this base I place a pinion M, which I support and drive upon a shaft M<sup>3</sup>, which turns in a box m'' upon the rim of the base and a box m<sup>2</sup> on the girt M<sup>2</sup>, 95 and protect them with a guard m'. The outer rim of the base is depressed a trifle more than the thickness of the pinion M, and is provided at intervals with anti-friction rollers L, arranged to form a perfect support for the table B by traveling upon the prepared surface I'. 100 The surface of the base inclines downward



toward the center and is provided with an aperture  $A'$  and a flange  $a'$  for the support of the knife-drum C.

The knife-drum C is constructed with an annular base  $C''$ , whose outside diameter is of a proper size to exactly fit into the aperture  $A'$  through the center of the base A, to which it is firmly secured by means of bolts or other suitable device and extends upward to  $h$  a short distance above the top of the table B, at which point it diverges to form the arc of a circle described between the points  $h$  and  $h^2$ , which arc should exactly correspond with the form of the dish to be cut from the block, and the diametrical size of the drum should exactly correspond with the form of the dish as cut across the block, so that the revolving of the block around the drum will cause the curved knives to cut a concavo-convex dish from the block of the desired form. The radii of the arc  $h h^2$  do not point to the diametrical center of the drum, but to a point somewhat below the center and parallel with the radii of the bed B upon a line depending downward toward the center. The object of this is to provide as large an opening through the base  $C''$  as possible for the escape of the dishes from the drum after they are cut from the block.

The top of the drum is inclosed with a solid cap  $i$ , so that no air can be drawn from the drum except as it enters through the openings back of the knives, thus utilizing the draft of air through the pipe  $O'$  to drawing the dishes from behind the knives as soon as they are out of cut.

I make my knives H of the exact curve each way of the drum and secure them to the drum by inserting the ends back of the lugs  $h$  and  $h^2$ , that hold them securely in place at each end of the drum, and secure them from being loosened out of place while in cut by means of screws or bolts  $h'$  through the body of the knives and into the body of the drum. Screws or bolts may also be used to secure the ends of the knives, if desired, instead of using the lugs.

At the center of the curve of the drum I form a rib  $C^2$ , against which the end of the block is forced, which acts as a guide to regulate the thickness of the dishes cut. The end of the rib as it approaches the knives sets back of the edges the desired thickness of the dish, while the end next to the back edge of the knives stands flush with the outer surface of the knives, thus forming a natural incline for guiding the block to the knives, as shown in Fig. 7.

The wall of the drum in the openings back of the edge of the knives at  $C'$  is beveled upon the angle of the bevel of the knives, so as to allow the dishes to pass through freely while being cut from the block.

I make the table circular in form, with the surface inclining downward as it approaches the center, as shown in Fig. 3, and in the center I form a circular opening  $B'$ , large enough to

admit of raising the table up over the drum and removing it from the base without first removing the drum. The objects of inclining the surface of the table downward as it approaches the center are twofold: first, to form an incline plane depending toward the center, so as to facilitate pressing the blocks toward the drum, and, second, to throw the radii of the curve  $h h^2$  in the drum below the center of the drum, so as to contract the upper end of the drum and throw out or expand the lower end, that the aperture through the neck will be large enough for the free passage of the dishes from the drum. The center of the table is supported by a yoke  $C'$ , which is securely bolted to the table and passes up over the top of the drum, and resting upon a collar  $C''$  upon the head of the drum, and works freely upon the pin  $c$ , so as to prevent any lateral motion or tremble to the table. The under surface of the table for a short distance in from the outer edge  $L'$  is planed off to form a flat surface, upon which the rollers L are designed to travel for the purpose of insuring a free yet steady motion to the table. At the inner rim of this surface a shoulder  $b'$  may be formed for the purpose of a guideway to act upon the inner edge of the rollers L and to assist the yoke in holding the table in a perfect line of travel, and in connection with the yoke insure the cutting of dishes of uniform thickness. Just below and inside of this shoulder I form a second shoulder, upon the periphery of which I form or attach the rack or gear  $M'$ , Fig. 4, which is intended to mesh with the pinions M for propelling the table around the drum.

When I employ two pinions for driving the table, for the purpose of using a continuous belt I make use of an idler  $M''$ , which turns upon a pin  $m$ , attached to the girt  $m^2$  at one side of the machine in a proper position to give the desired lap of belt upon the pulley  $m^3$ , that drives the pinion.

Upon the upper side of the table B, I secure a series of carriages or guides  $D D'$  for the support of the blocks, and in position to feed the ends of the blocks in a direct line toward the center of the drum, so that the cutting of the knife will be across the end of the block and the block always approaching the drum and knives sidewise with the end standing directly toward the center of the drum. At the end of the guide D next to the drum I place a guard G, of a proper form to bear its entire length upon the surface of one side of the block and support the end next to the knife while the dishes are being cut therefrom, and upon the back of the guide I form a rib  $d'$ , for the purpose, first, of forming a guide for the carriage E, and, second, to act as a bearing for one side of the block to prevent friction in forcing it forward to the drum. On the opposite side of the carriage I place a guide  $D'$  for the support of the opposite side of the block. I prefer that the point  $d^3$  of this guide where it comes in contact with the



surface of the block be sharp, so as to prevent the block from turning, and to still further secure it in position I place an adjustable anti-friction roller  $F^2$  in a frame  $F'$ , which is supported by and made to turn freely upon an arm  $F$ , which in turn is secured to the guide  $D$  in such a manner that the roller is brought to bear upon the block in a triangular direction from the line of the points  $d' d^3$ , and is held firmly against the block by means of a spring  $f'$ , secured at one end to an arm  $f^2$  on the frame  $F'$  and at the other end to the guard  $G$ . For the purpose of raising the roller off the block I attach a handle or lever  $f$  to the frame in such a manner that it may be easily manipulated by the operator.

For the purpose of forcing the block toward the knives I make a carriage  $E$ , of a proper width to work between the guides  $D$  and  $D'$  and of a proper height to reach above the center of the block. Upon one side of this carriage I form a notch  $d''$  to work upon the rib  $d'$  on the guard  $D$ , and on the opposite side I form a notch  $d^2$  to work upon the point  $d^3$  of the guide  $D'$ , and for the purpose of holding the carriage in position I form a dovetailed rib  $e''$  upon the surface of the table and a corresponding dovetailed groove  $e^2$  in the bottom of the carriage, which acts with the notches  $d'' d^2$  as a guideway for holding the table in place and securing a perfect action.

At the back end of the table I form an aperture  $e$  for the reception of the ends of the springs  $I$ , and in the face of the table I place spurs or points  $e'$ , that may be forced into the end of the blocks to hold them in place and to draw the splats away from the knives when the blocks have been entirely worked up. These carriages are forced toward the blocks by means of heavy springs  $I$ , that are supported upon standards  $J$ , pivoted to the table and provided with ratchets and pawls  $J'$  for holding the springs firmly against the carriages. In the tops of these standards I insert a series of pins intended to be operated upon by a lever for turning the standards, so as to force the springs solidly against the carriages.

In constructing these machines I find it advisable to make use of four sets of guides and four knives, and for this purpose I place my guides so that there will be two wide and two narrow vacant spaces upon the table; and I secure the yoke  $C'$  and also the four springs  $I$ , standards  $J$ , and pawls  $J'$  in the larger spaces. By this means one pair of the springs passes over the top of the guide  $D'$  to reach the carriages, and the other pair must pass through the backs of the guide  $D$ , and for this purpose I form an aperture  $d$  through them, as shown in Figs. 2 and 7.

For the purpose of drawing the carriages back from the knives a spring  $I'$  may be attached at or near the standard  $J$  in such a manner that it will throw the standards around backward and withdraw the springs

and carriages when the pawls  $J'$  are removed from the ratchet-teeth on the standards.

For the purpose of averting the danger of injuring the operator by being struck with the handle of the pawls when revolving with the table around the drum I incline all of the handles in the direction opposite to that in which the table is moving.

My appliance for clearing the machine of dishes when cut consists of a hollow drum  $C$ , that supports the knives and into which the dishes fall when cut from the block; a large mouth  $C''$  at the lower end of the drum for the free passage of the dishes therefrom, and a large pipe  $O$ , extending down from the mouth of the drum to the storage-bin, said pipe being provided with an air-pipe  $O'$ , which is connected with a blower in such a manner that a current of air will be continually drawn from the pipe through the drum, which is so arranged that air can enter only through its apertures at the cutting-edge of the knives.

The manner of cutting dishes from wooden blocks with this machine is to place a series of blocks upon the rotating table in the guides with the grain of the timber running crosswise of the blocks or at right angles with the guides and parallel, or nearly so, with the perpendicular center of the drum, so that the knives will enter the blocks at the side of the grain layers and force the blocks toward a stationary drum having knives attached at intervals of a proper form to give the desired form to the dishes.

My means of providing against the necessity of trimming the ends of the blocks after the cutting of each successive dish consists of turning the blocks up to the exact form that I desire to have the edges of the dishes. Hence if I desire a round dish I cut from a round block, and an oval dish I cut from an oval block, its blocks being turned off to form by "wabble-saws" or other suitable device.

For the purpose of securing a smooth cut upon the dishes and of preventing the breaking of the edge as the knife leaves the block I make my knives with a deep curved edge  $h^3$ , of such a form as to insure a shearing cut, for the purpose of securing the drum firmly to the bed. I sometimes form a flange  $C'''$  upon it, by which it may be bolted solidly to the bed, in which case I make the aperture  $B$  through the table large enough so that it will not interfere with the flange.

If desired, the solid drum heretofore described for the support of the knives may be dispensed with, and a skeleton frame, as shown in Fig. 10, may be substituted therefor, and for this purpose the skeleton frame may be made and bolted to the base of the machine and the knives bolted thereto, or the knives themselves may be formed with a flange  $C'''$  at the lower end and be bolted directly to the base, with the upper end supported as shown; but when this form is used I find it necessary to feed my blocks to the knives with the or-



dinary screw-feed, unless I insert a rib C<sup>2</sup>, as shown, between the left-hand and center knife in Fig. 10. When this rib is used, I find it necessary to extend it by the cutting-  
5 edge of the knife and bolt it to the back edge at c<sup>5</sup>.

I do not restrict myself to the use of a gear and pinions for driving my table, but reserve the right to use any known appliance  
10 that is applicable to the purpose.

As the action of the blower in drawing air through pipes is understood by all expert machinists, and as it forms no part of my invention, I will not describe this feature in my  
15 specification or illustrate it in my drawings; but,

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

20 1. A machine for cutting dishes from wood, having a stationary frame for supporting a knife-drum and a rotary table, concavo-convex knives secured to and projecting upward from the center of the top of the frame, an  
25 opening in the center of the top of the frame between the knives for the escape of the dishes when cut, a table made to rotate upon a stationary frame around the knives, anti-friction rollers to facilitate the motion of the  
30 table, guides upon the table for supporting the blocks and conducting them toward the knives, mechanism for feeding the blocks toward the knives, and mechanism for rotating the table, substantially as and for the pur-  
35 pose set forth.

2. The combination, in a machine for cutting dishes from wood, of a circular base for the support of the machine, provided with pinions for driving the table and rollers for  
40 supporting the table, a hollow drum for supporting the knives, provided with apertures at the edge of the knives for the passage of the dishes, a large opening below for the escape of the dishes, and a solid cap, a table, a  
45 rack or gear upon the under side of the table for propelling the same, a yoke secured to the bed of the table and passing over the drum, a pin at the top of the drum for the yoke to work upon, a series of guards for con-  
50 ducting the blocks toward the drum, a carriage, an arm for supporting an adjustable roller, a guard for holding the blocks in position, springs for holding the adjustable rollers firmly upon the blocks and a handle for  
55 manipulating the same, concavo-convex knives secured to the drum, having their edges so curved as to produce a perfect shearing cut upon the blocks, and springs secured upon adjustable standards provided with  
60 ratchets and pawls for forcing the blocks toward the knives, substantially as and for the purpose set forth.

3. The combination, in a machine for cutting dishes from wood, of a base having the surface inclining downward to the center and  
65 an aperture for the reception and support of the drum, pinions for driving the table, rollers for supporting and carrying the table, a drum for holding the knives, the drum being firmly attached to the center of the base  
70 and the top inclosed with a solid head, the lower end having a large opening for the escape of the dishes, the body expanding to a proper form for the dishes to be cut and provided with apertures for the passage of the  
75 dishes from the knives, knives secured to the drum, the edges of which are curved to produce a perfect shearing cut, a table having a rack or gear on its under surface to mesh with the pinions to give it a rotary motion, the  
80 surface of the table inclining downward toward the center and provided with an aperture around the drum, a yoke attached to the surface of the table, passing over the drum, and working upon a pin at the top of the  
85 drum, guides for conducting blocks to the knives, adjustable rollers for holding the blocks in place, springs for holding the rollers firmly upon the blocks, a carriage at the end of the blocks, springs for throwing the blocks  
90 toward the knives, standards for supporting the springs, pawls and ratchets for holding the springs in place, and springs for throwing the carriages back from the knives, substantially as and for the purpose set forth. 95

4. The combination, in a machine for cutting dishes from wood, of a base for supporting the machine, pinions for driving the table, rollers for supporting and carrying the table,  
100 a drum for sustaining the knives, knives having their edges curved to produce a shearing cut, apertures in the drum back of the edges of the knives, the upper end of the drum closed with a solid cap, the lower end pro-  
105 vided with a large opening and pipe, and an air-pipe to facilitate the escape of the dishes from the drum at the edges of the knives, a revolving table, a yoke to support the center of the table, guides to conduct the blocks to  
110 the knives, adjustable rollers to hold the blocks in place, a guard to prevent the blocks from turning, springs to hold the rollers firmly upon the blocks, carriages having spurs for holding the blocks and drawing the spalts  
115 toward the knives, springs for forcing the blocks toward the knives, standards for supporting the springs, pawls and ratchets for holding the standards in place, and springs for throwing the carriages back from the knives, substantially as and for the purpose set forth.

WALTER S. SHOTWELL.

In presence of—

I. J. CILLEY,  
G. W. CHAMBERS.