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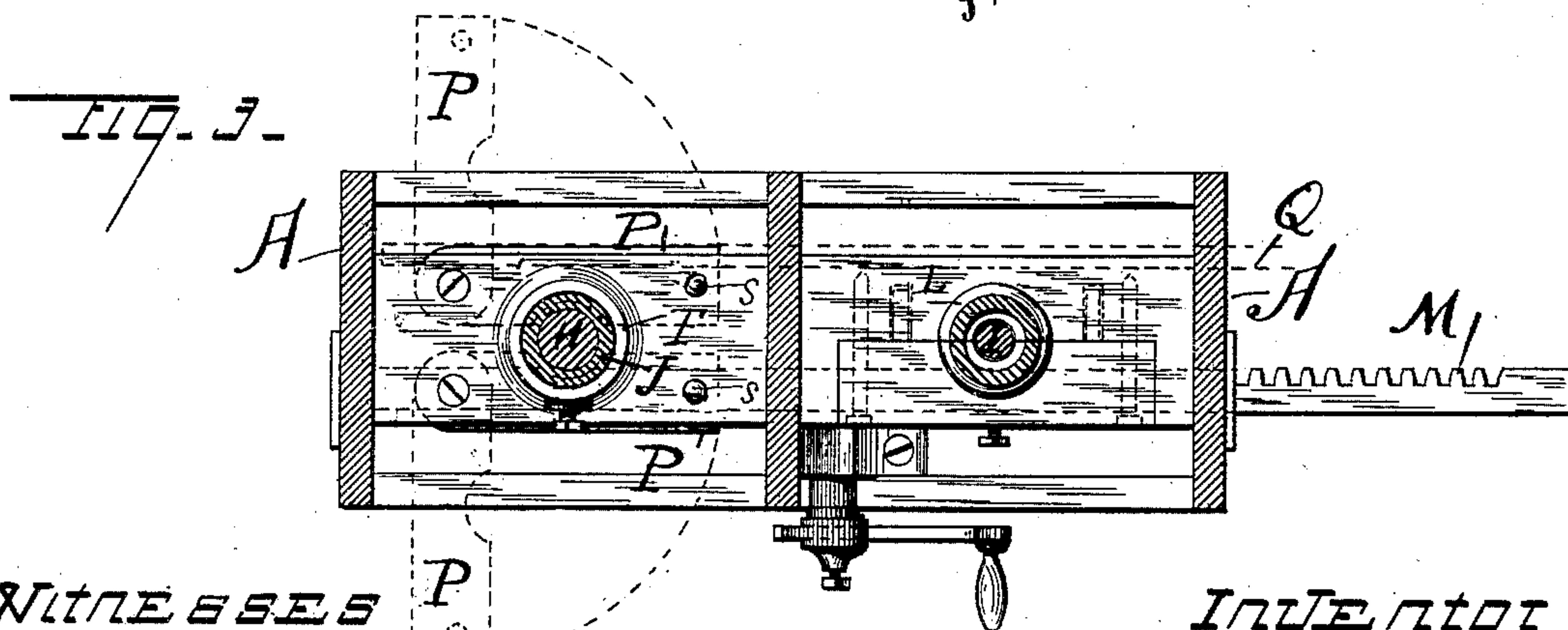
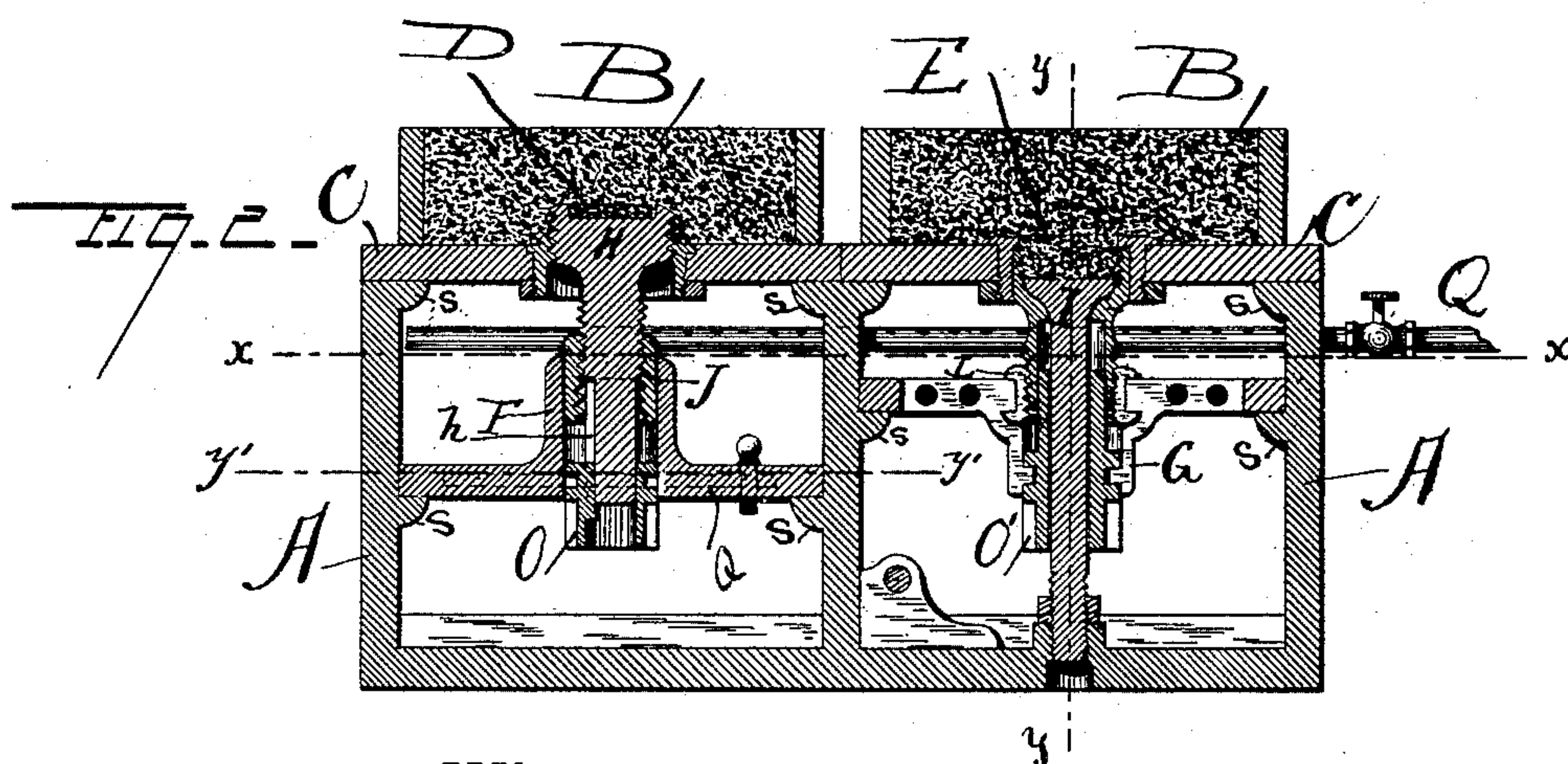
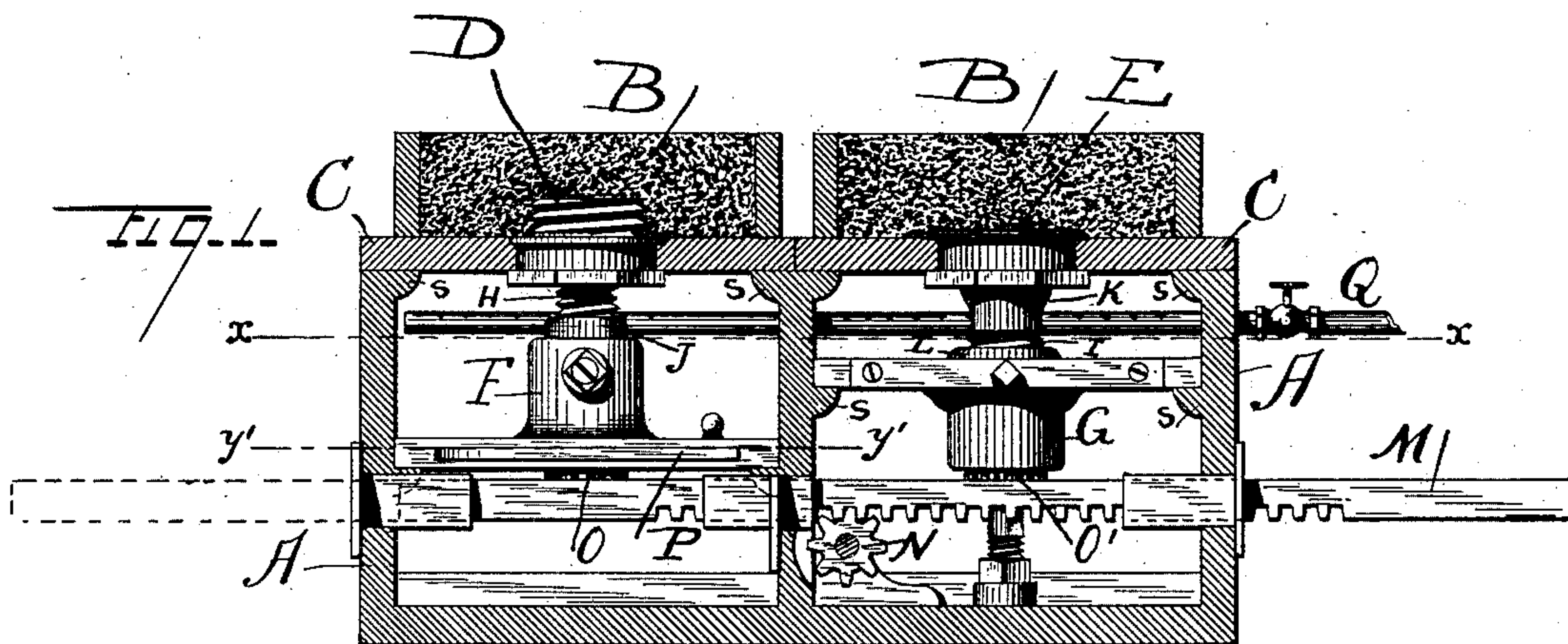
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A. G. ANDERSON.

BUNG BUSH MOLDING MACHINE.

No. 360,404.

Patented Apr. 5, 1887.



WITNESSES

as Jare  
W. S. Bates

INVENTOR

Anton G. Anderson.  
By Banning & Banning,  
ATTORNEYS



(No Model.)

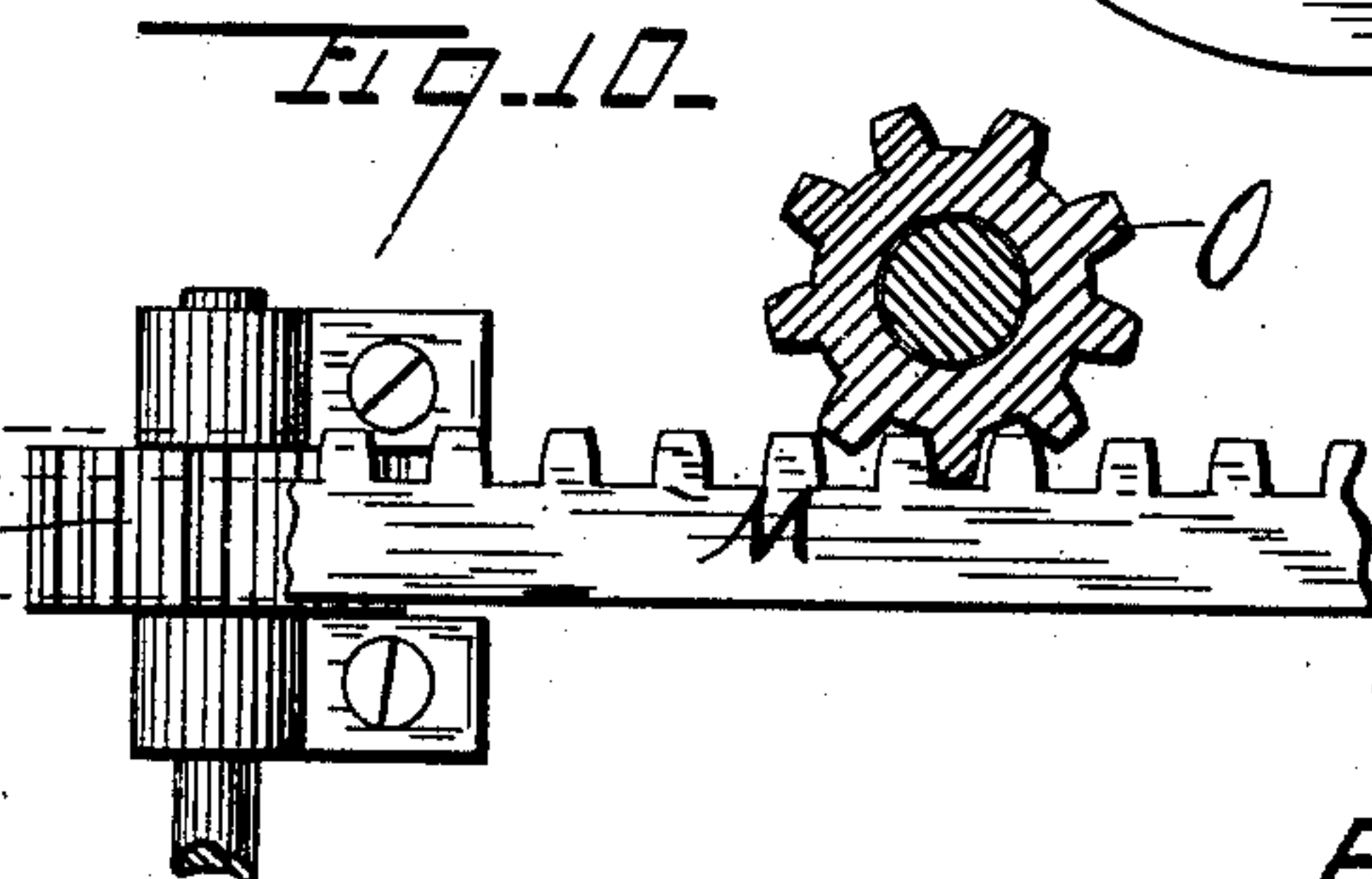
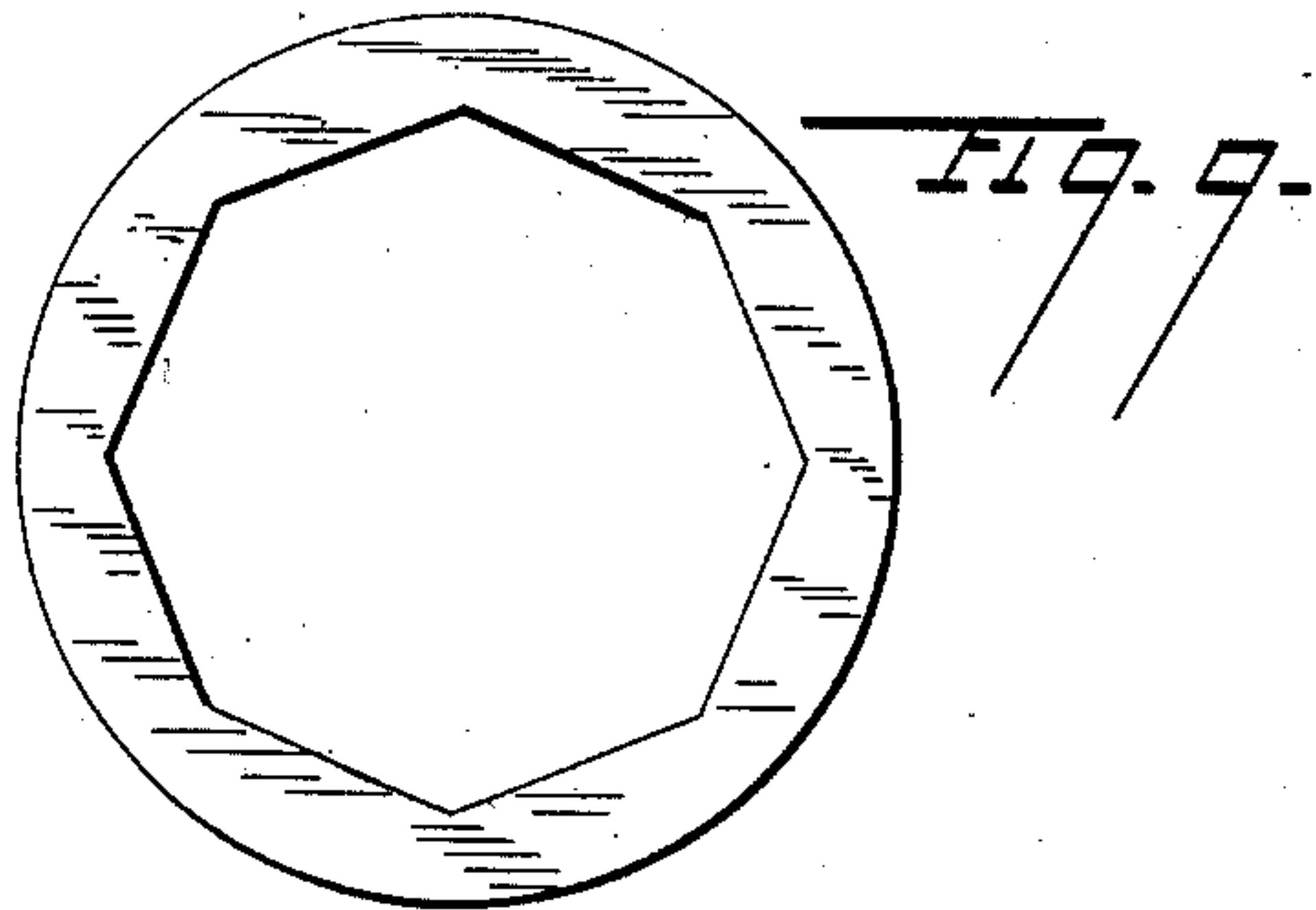
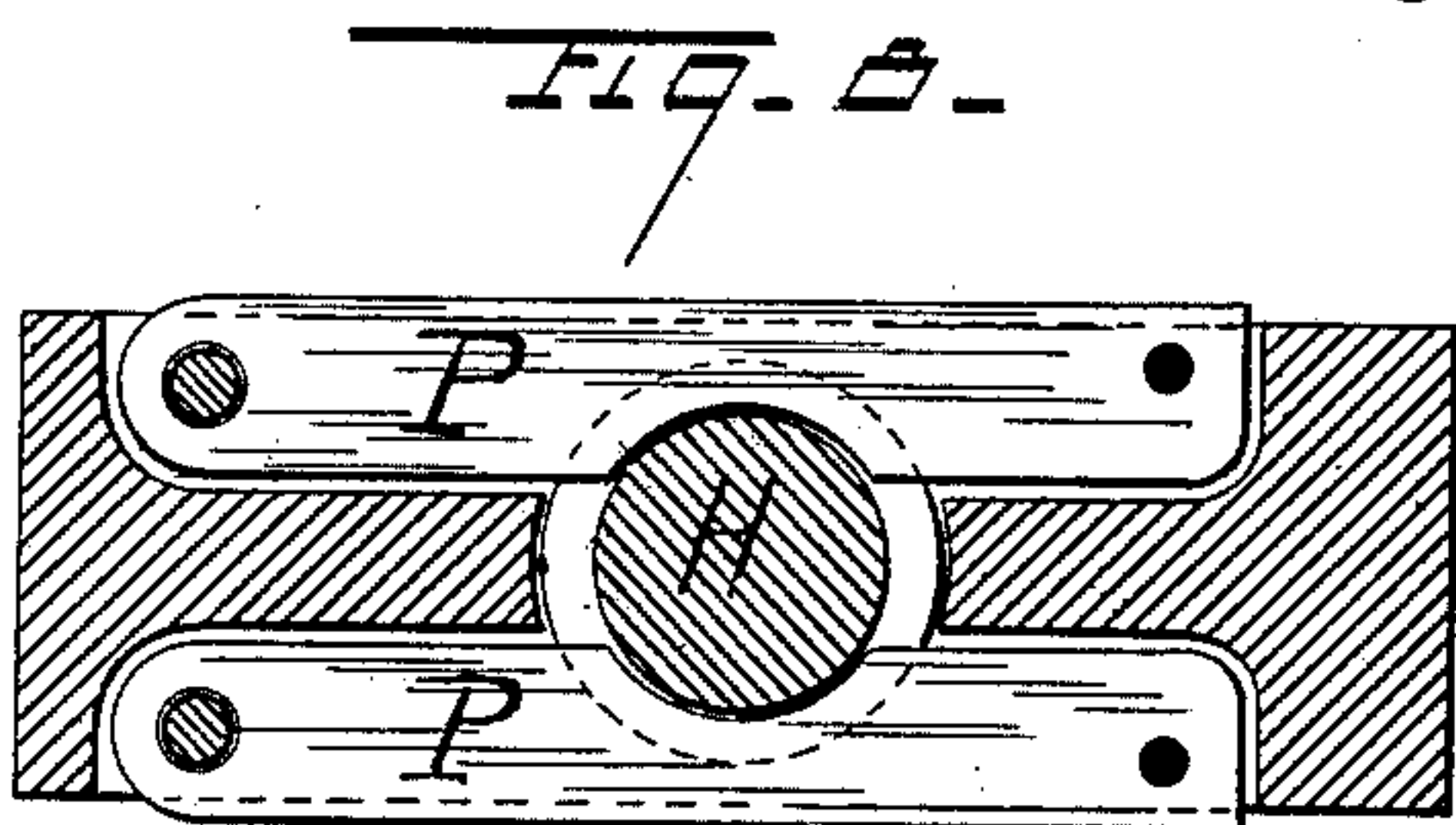
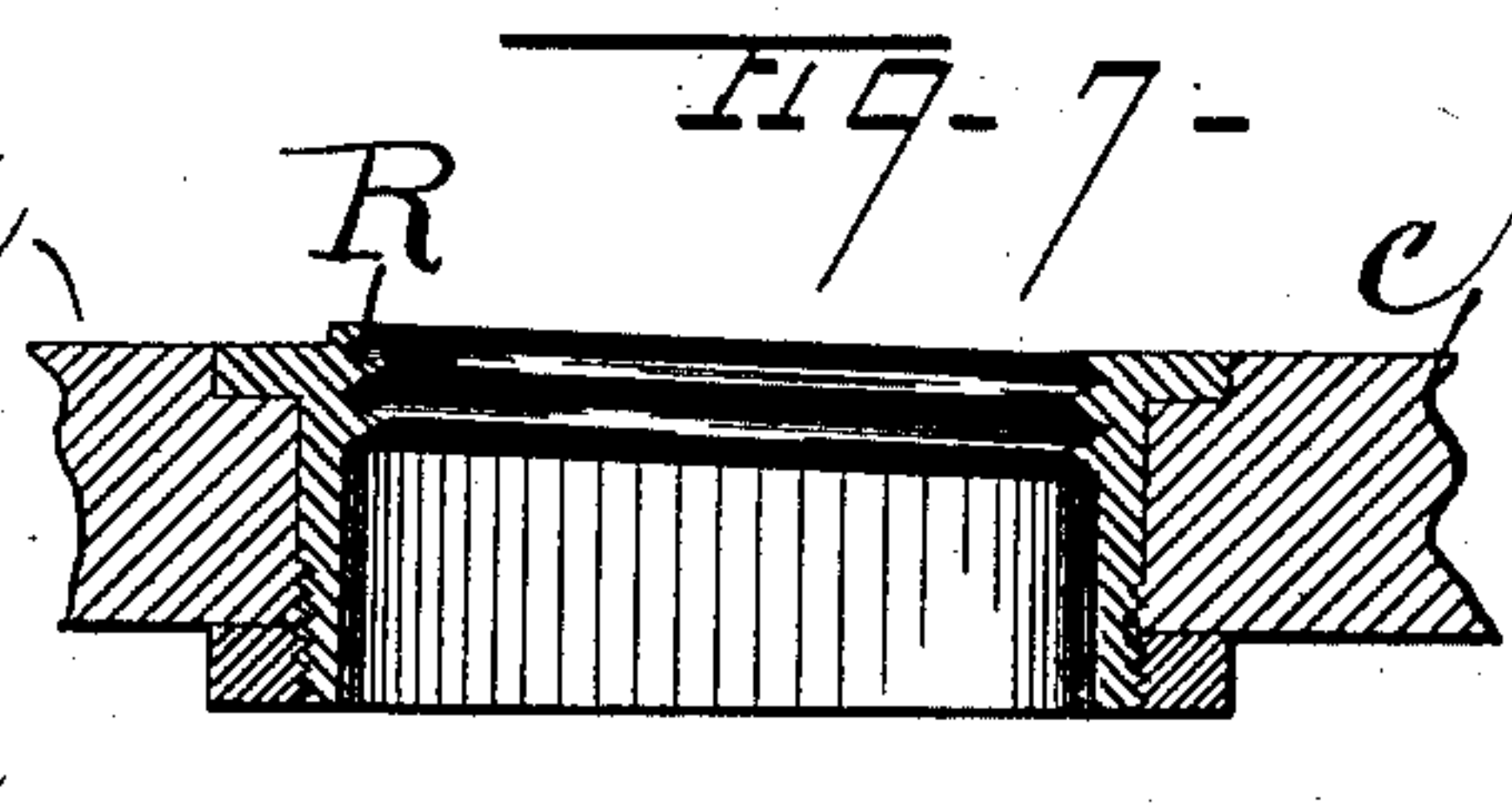
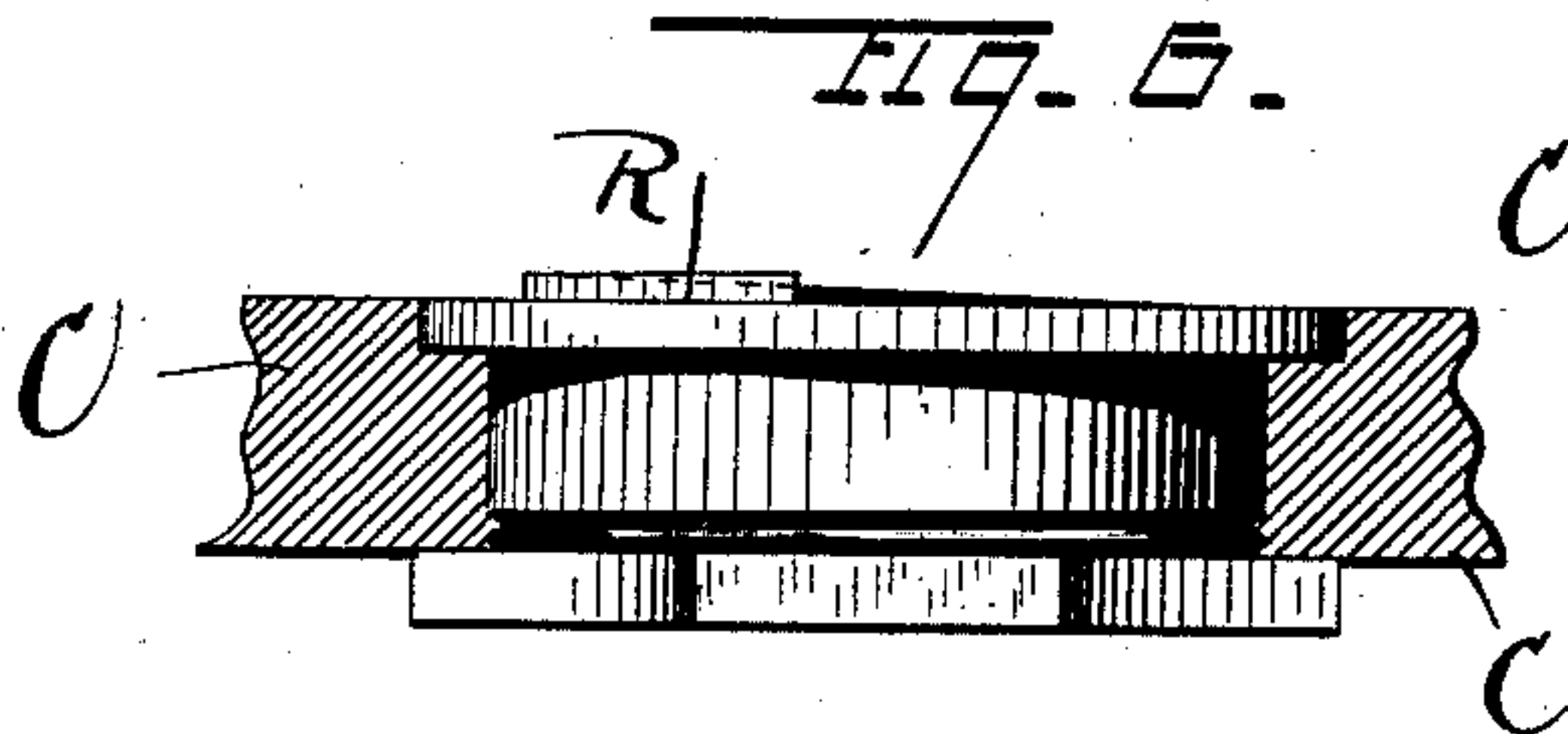
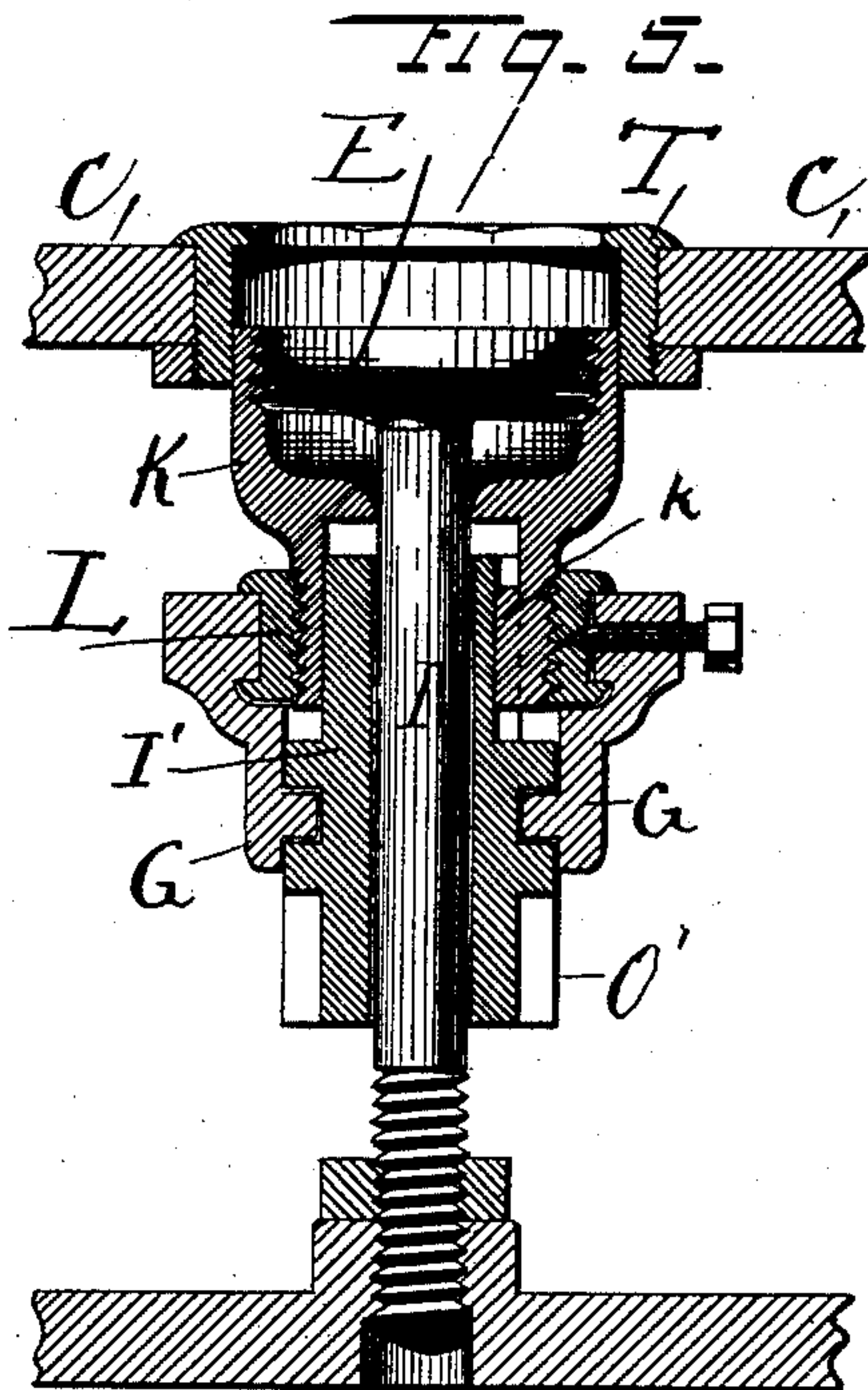
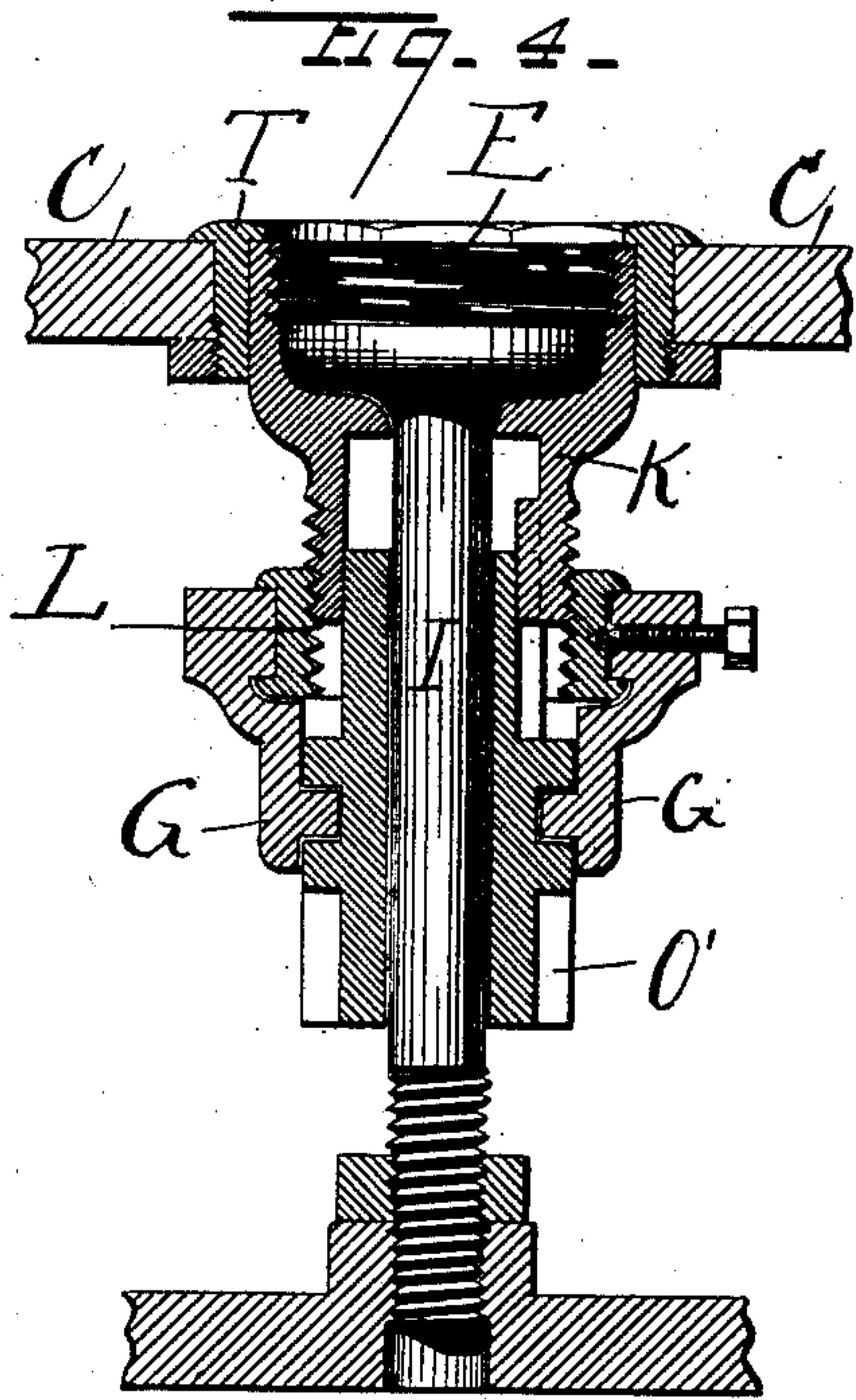
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# UNITED STATES PATENT OFFICE.

ANTON G. ANDERSON, OF CHICAGO, ILLINOIS.

## BUNG-BUSH MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 360,404, dated April 5, 1887.

Application filed June 5, 1886. Serial No. 204,226. (No model.)

*To all whom it may concern:*

Be it known that I, ANTON G. ANDERSON, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Machines for Molding Bushes, of which the following is a specification.

In the drawings, Figure 1 is a side elevation of my improved molding-machine, but showing the supporting-frame and flask in section. Fig. 2 is a vertical longitudinal section of the machine. Fig. 3 is a sectional plan view, taken on line *x x* of Figs. 1 and 2, showing the locking-plates for supporting the standard on which the pattern for the external configuration of the bush is placed in dotted lines. Fig. 4 is a cross-section of the standard-sleeve attachments for forming the core of the bush, taken on line *y y* of Fig. 2, with the standard elevated. Fig. 5 is the same with the standard-sleeve lowered. Fig. 6 is a side elevation of the collar around the threaded spindle-lining on the table, particularly showing one-half of the thread above; Fig. 7, a cross-section of the same. Fig. 8 is a plan view of the locking plates or bars, taken on line *y' y'* in Figs. 1 and 2, and also shown by dotted lines in Fig. 3. Fig. 9 is a plan view of a finished bushing as made by the machine, and Fig. 10 a plan view showing the rack in engagement with the driving-spindle wheels.

A is the table or frame on which the parts are mounted; B, the molding-flasks and sand; C, the top of the frame or table; D, the pattern for forming the external configuration of the bush; E, the pattern for forming the core; F, a barrel or box through which the standard supporting the pattern for the external form of the bush is passed; G, a stationary barrel or box through which the standard supporting the core-pattern is passed, terminating at its lower end in a gear-wheel; H, a revolving standard or spindle for the external bush-pattern; I, a standard or spindle for the core-pattern; J, a threaded loose collar around the standard H, by which the same is steadied and held in place; K, a threaded sleeve or collar around the supporting core or standard I; L, a threaded ring or collar, in which the threaded sleeve or collar K engages; M, a rack; N, a pinion; O and O', toothed wheels on the sleeves or boxes around the standards

H and I; P, locking plates or bars for holding the wheel-sleeve around the lower part of the standard H in place; Q, a gas or other heating pipe, and R a shoulder or projection on the pattern for forming the exterior of the bush.

In making my improved bung-bush molding-machine I combine in one machine all the parts employed for making both the external and internal form of the mold in which they are to be cast. I take a table or bench of proper form and height to receive the flasks in which the green molding-sand is to be packed, and provide its top with openings through which the patterns may be raised or lowered. Of course as many or as few openings in the top of the table may be employed as desired. At convenient distances below the top of the table, and on the frame of the table or bench, I put supporting-brackets *s*, to receive a piece or shelf, Q, by which the weight of the pattern-carriers is wholly or partially supported. These brackets and shelves are plainly shown in Figs. 1 and 2. I prefer to divide the table into two parts by a vertical partition, as shown in these same figures. One part is arranged for making the external and the other the internal shape or configuration of the bush, and I shall term the patterns, respectively, "external" and "internal" patterns.

Resting partially or wholly upon and passing through the supporting-plates upheld by the brackets *s* are arranged vertical spindles H and I, for raising and guiding the patterns for the bung-bush molding. The spindle I passes down to the bottom of the frame and rests upon a step or block, which receives most of its weight, while the spindle H and its connections are wholly sustained by the supporting-plate. The spindle H is provided through connections with a cog or toothed wheel, O, to which it is splined and by which it may be rotated. A barrel or box, F, which may be an upward extension of the supporting-plate, surrounds the middle portion of the spindle H. A barrel or box, G, also surrounds the middle portion of the spindle I, with sufficient space between them to permit an internally-threaded collar or ring, L, and a pattern, K, externally threaded at its lower end and engaging with the ring, to be placed be-



tween the collar G and the hub I', surrounding the spindle I. The space between the box F and spindle H is sufficient to permit an internally-threaded collar, J, to be placed between the upper end of the barrel F and the spindle H, which is at that point externally threaded to engage therewith.

A rack, M, running lengthwise of the table or frame, is double—that is to say, has teeth on two of its sides. The teeth on the lower side of this rack engage with the teeth of a pinion, N, by which it is moved back and forth. The teeth on the other side of this rack engage with the teeth on the wheels O and O'. The hub of one of these wheels, O, is rigidly attached to the spindle H by means of a spline, h, on such spindle, fitting into a slot in the hub, and the hub I' of the other wheel, O', surrounds the spindle I and revolves in the box G, turning the pattern K, to which it is rigidly attached by means of a spline, k.

The spindle H is threaded toward its upper end, so as to engage with the threaded collar J. Its upper end is made of the size intended for the outside of a bung-bush, and is externally threaded, as shown in Figs. 1 and 2. This threaded upper end of the standard H forms a pattern for the external shape and configuration of a bung-bush. As the standard H is rotated in the one direction or the other by the rack M and pinion N, or by bevel-gears, which will operate with equal advantage, it is raised or lowered above or below the upper surface of the table-top. The hub on wheel O, which is connected with the standard H by a spline, h, as above described, is supported and held in place around such standard by means of clamps or plates P, which fit into a groove around the same, and which may be fastened and firmly held in a closed position by a pin, s, which pin passes through the same and into the supporting-plate. In this way such wheel is prevented from falling out of place. This construction will be apparent from a reference to Figs. 1, 2, 3, and 6.

I have shown a different method of steadying or supporting the standard I in the right-hand portion of Figs. 1 and 3. Here I employ a box, marked G in Fig. 1, provided with a cap or flange, T, extending toward and partially surrounding the standard I. This box is held in place by screws and dowel-pins, the holes for receiving which are shown in the right-hand portion of Fig. 2.

As the hub I' of the wheel O' is rotated it rotates the pattern K in the collar L, which is held stationary by a set-screw through the box G, as shown in Figs. 4 and 5. The internal threads of this collar L engage with the external threads of the pattern K, so as to raise or lower it as it is turned in the one direction or the other. The upper end of this collar K passes up into a flange, T, which is secured in place in the hole in the table-top above the spindle I, which is intended to form the inside core of the bung-bush mold. The top of this

flange is made with as many sides around its interior as the exterior of the bung-bush flange is intended to have, as shown in Fig. 9. The threaded pattern K is hollowed out at the upper end, and provided with internal screw-threads therein, so that the form of the core made of molding-sand will have threads on the external surface to produce threads on the interior surface of the bung-bush when molded.

To form a suitable rest or bottom against which the molding-sand forming the core may be packed, I enlarge the upper end of the spindle I, as shown in Figs. 4 and 5, to rest and fit in the bottom of the hollowed top of pattern K. The spindle I may be adjusted by a nut at the bottom to any desired height, so that it will give greater or less depth in the hollowed end of collar K as the core for the bung-bush may be desired to be short or long. Around the opening, through which the pattern on the head of the spindle H passes when being elevated to make a mold, I arrange a metal lining with its upper edge projecting, say, half-way around, as at R, in Figs. 6 and 7. This projection terminates abruptly, as shown in Fig. 6, and forms the end of the thread in the mold, which in the bung-bush or product terminates against and under the flange. This prevents the thin wedge-shaped block of sand for the last part of the screw-thread, which would be formed if R were not present, from being formed.

To keep the molding table and patterns at the proper temperature for successful molding, I carry, preferably, a gas-pipe, Q, along beneath the same, and provide it with a number of perforations, at which the gas may burn and produce the requisite warmth. Other means of heating can be employed, though I deem this the most convenient.

The operation of the machine is as follows: The pinion N is rotated and the rack M advanced. The spindle H and the pattern K are run up to the desired height. The pattern on the spindle H will be elevated above the top of the table, and the pattern K, whose hollowed end forms the pattern for the internal configuration of the bung-bush, will be elevated till its top rests against the projecting edges of the flange T. Flasks are placed on the table, and the green molding-sand, in proper condition for molding, is packed and tamped into the flasks, as shown in Figs. 1 and 2. If, now, the pinion be reversed and the rack run in the other direction, the spindle I and pattern K will be rotated out of contact with the sand, leaving in one flask a depression of the exact configuration of the pattern on the spindle I, and in the other flask a projecting core of the exact configuration of the interior of the hollowed end of the pattern K. The flasks are then taken from the table, placed together in proper position, with the core extending into the depression, when molten metal may be flowed in and the casting formed in the usual way. These parts will form the



bung-bush, externally and internally threaded, with a flange at the top of the desired shape.

One of the advantages of making the machine as above described is that the molds for  
5 both the outside and the inside of the bung-bush are made in the same machine and at the same operation, at one bench or table, and with the same rack and pinion or racks and pinions, as more than one may be employed, if  
10 desired.

What I regard as new, and desire to secure by Letters Patent, is—

1. In a machine for making molds for bung and other bushes, the combination of a table  
15 or bench provided with suitable openings, a vertically-adjustable standard, I, enlarged at its upper end, a revoluble and vertically-movable pattern, K, hollowed at its upper end and externally threaded and surrounded at its  
20 lower end by an internally-threaded and stationary collar, L, and wheel O', to the hub of which the lower end of such pattern is splined, by which the pattern is rotated and up and down which it moves, the enlarged  
25 end of the standard resting in and forming an adjustable bottom to the hollowed end of the pattern, and a double rack, M, and pinion N, for rotating the wheel O' and raising and lowering such hollowed and revoluble pattern into  
30 and out of the opening in the table, substantially as described.

2. In a machine for making molds for bung and other bushes, the combination of a table or bench provided with suitable openings, a  
vertically-movable and revoluble standard, H, 35 enlarged at its upper end and externally threaded, and a lining around the opening in the table or bench internally threaded, with its upper thread terminating in an extension, R, the external threads on the enlarged end of  
40 the standard and the internal threads in the lining around the opening in the table engaging with each other, and mechanism for raising and lowering such revoluble standard, substantially as described. 45

3. In a machine for making molds for bung and other bushes, the combination of a table or bench provided with suitable openings, a  
vertically-movable and revoluble standard, H, enlarged at its upper end, externally threaded 50 and adapted to be raised into and lowered out of such openings, wheel O, for rotating such standard, and locking bars or plates P, for holding the wheel O in place, substantially as described.

ANTON G. ANDERSON.

Witnesses:

THOMAS A. BANNING,  
EPHRAIM BANNING.