

(No Model.)

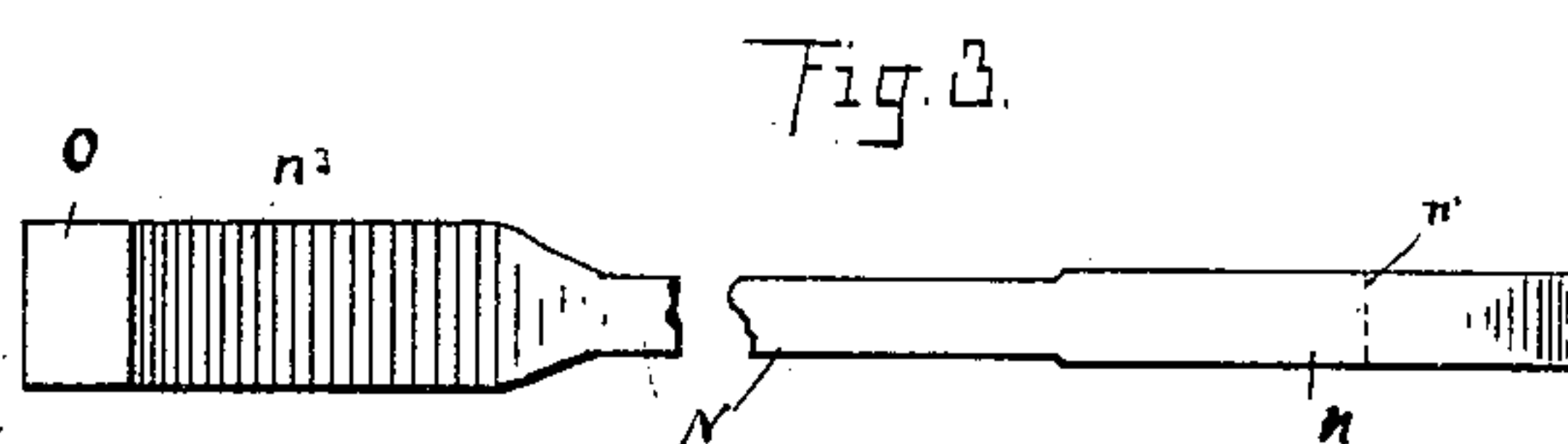
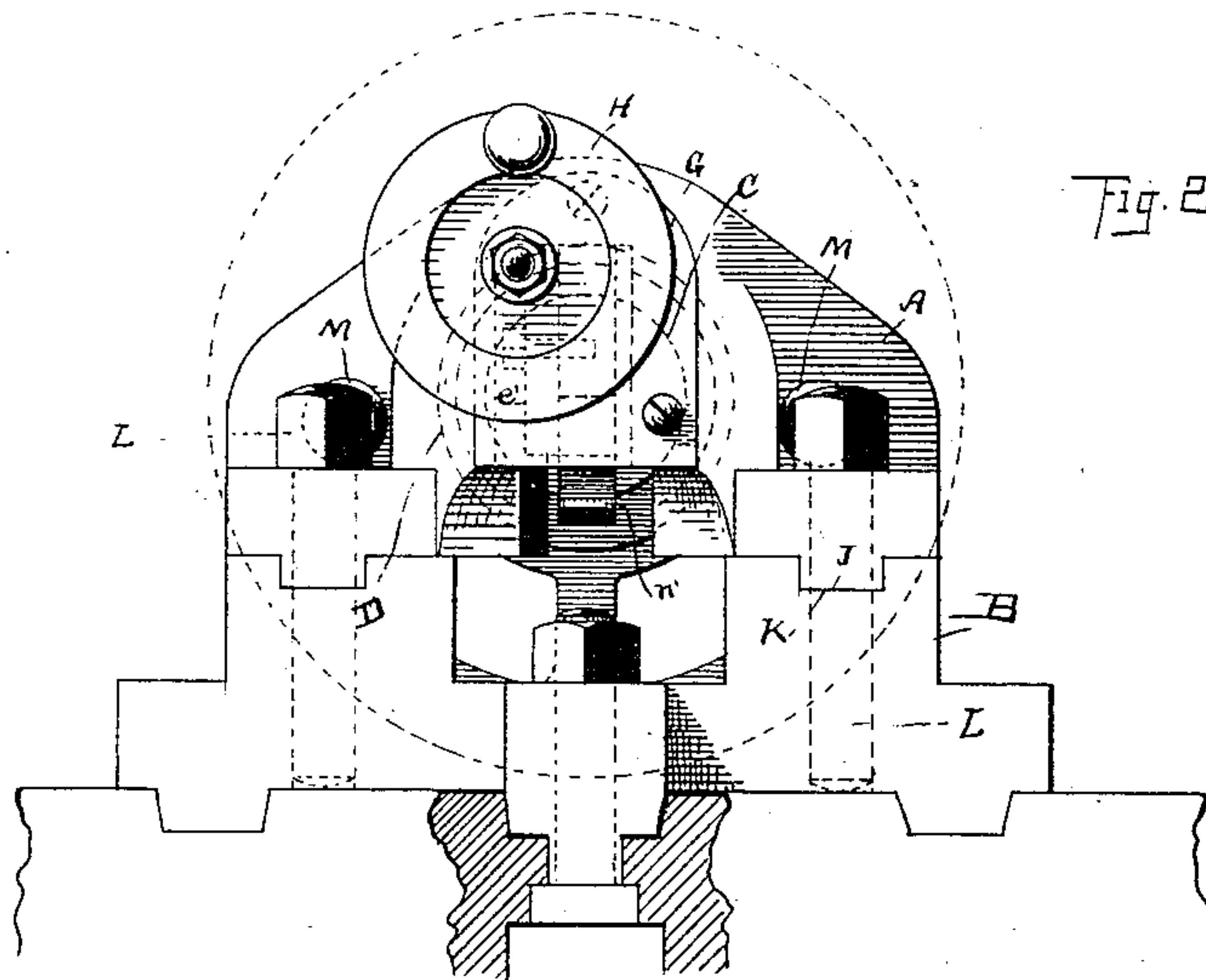
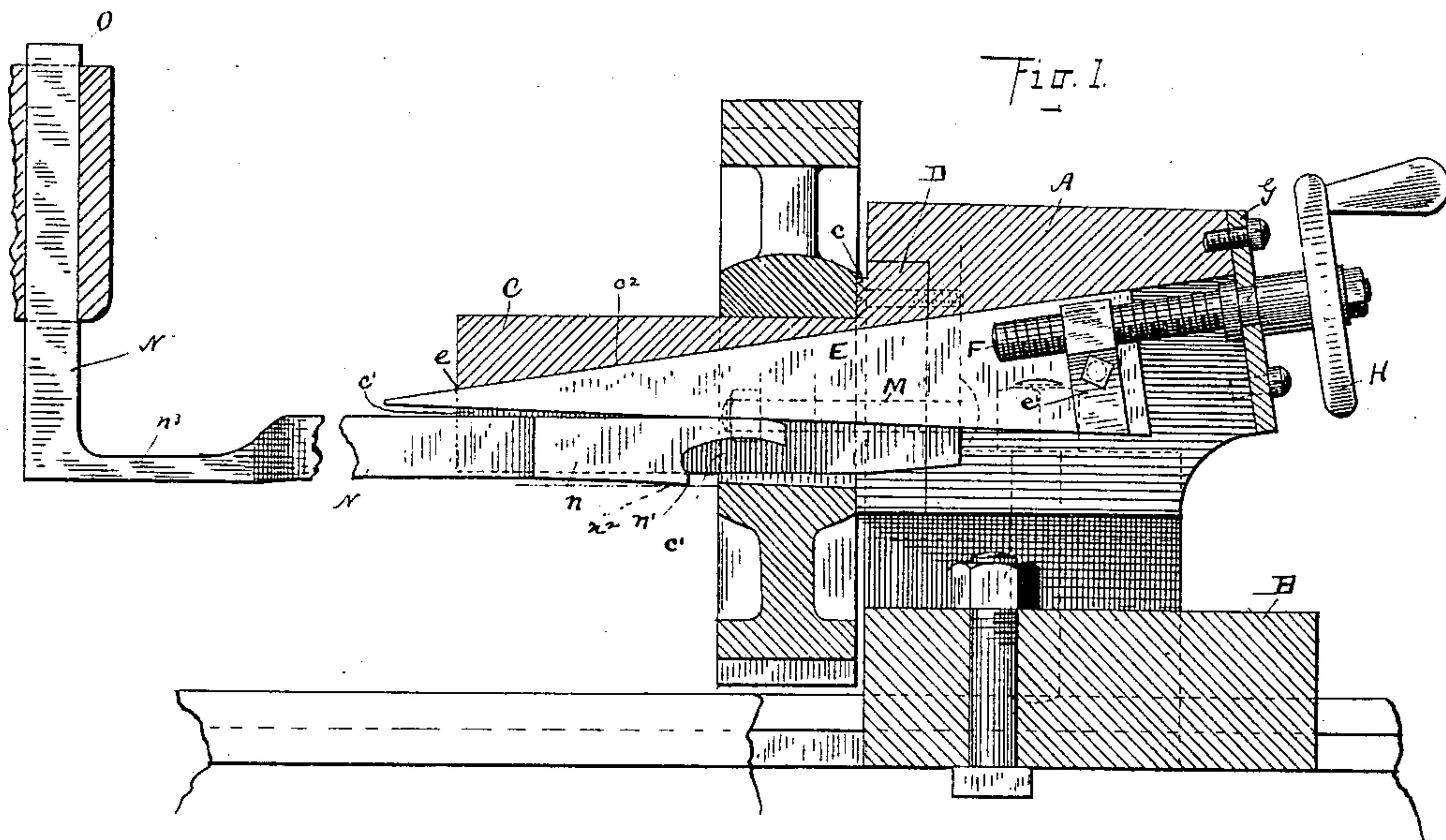
2 Sheets—Sheet 1.

A. M. BENSON.

KEY SEAT CUTTER.

No. 335,333.

Patented Feb. 2, 1886.



WITNESSES,

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INVENTOR.

A. M. Benson
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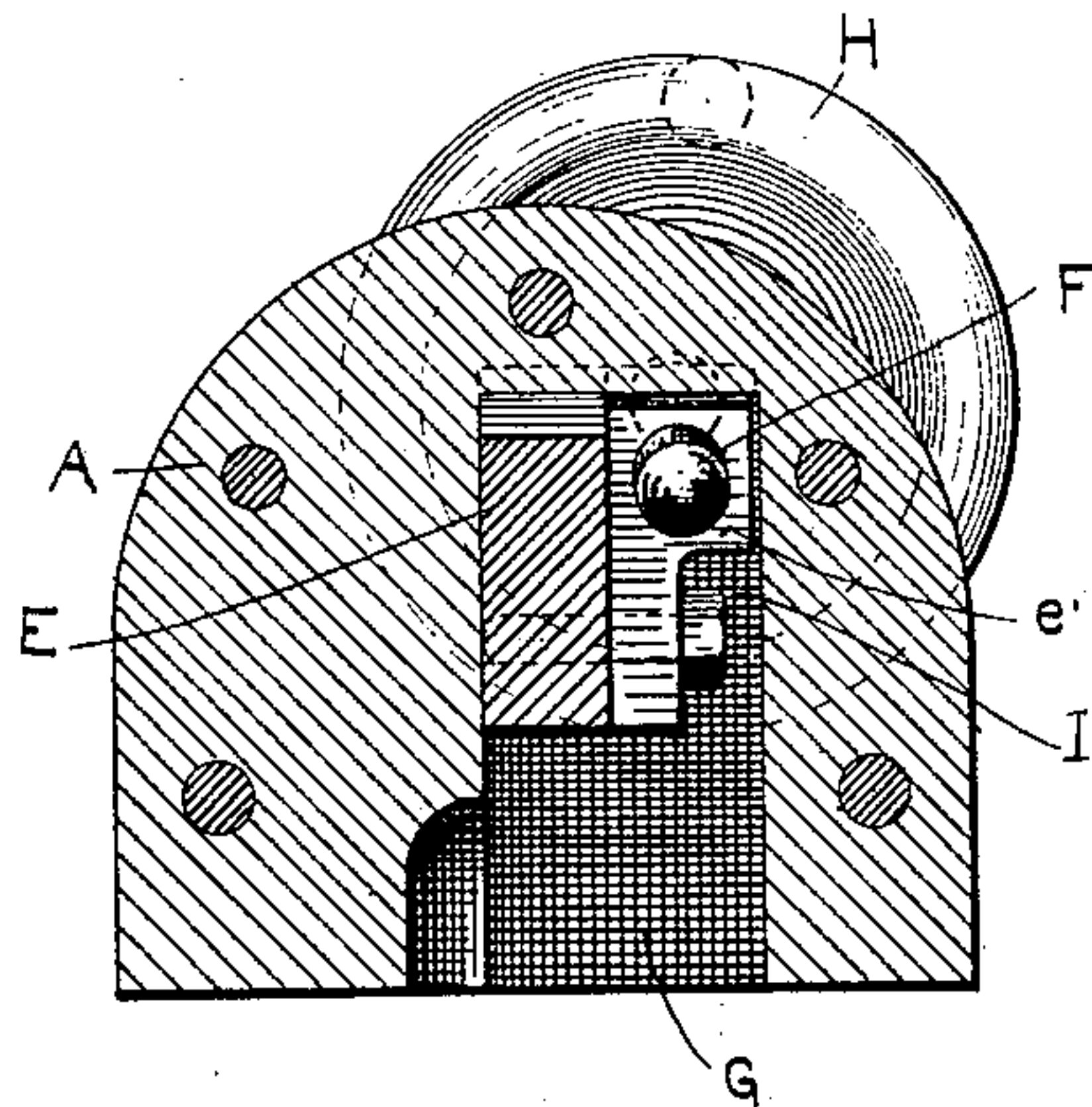
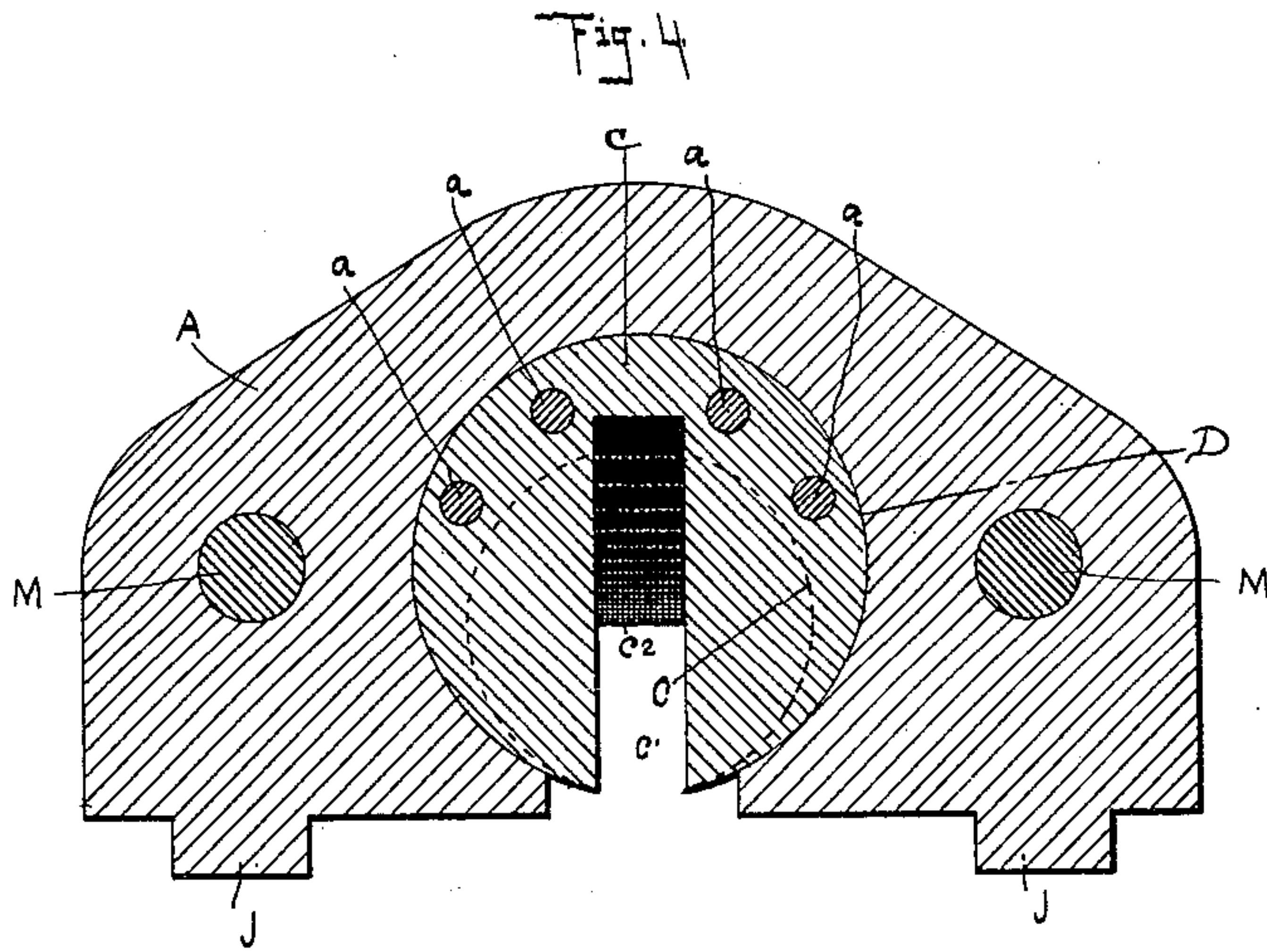


Fig. 5.

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UNITED STATES PATENT OFFICE.

ARZA M. BENSON, OF CLEVELAND, OHIO.

KEY-SEAT CUTTER.

SPECIFICATION forming part of Letters Patent No. 335,333, dated February 2, 1886.

Application filed November 6, 1885. Serial No. 181,990. (No model.)

To all whom it may concern:

Be it known that I, ARZA M. BENSON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Key-Seat Cutters; and I do hereby declare the following to be a description of the same, and of the manner of constructing and using the invention, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it appertains to construct and use the same, reference being had to the accompanying drawings, forming a part of the specification, the principle of the invention being herein explained and the best mode in which I have contemplated applying that principle, so as to distinguish it from other inventions.

In the drawings, Figure 1 is a longitudinal vertical section through the mandrel-slot, showing the wedge and the cutting-tool fitted therein in side elevation, and representing a pinion in place on the mandrel. Fig. 2 is a rear end elevation of the invention. Fig. 3 is a plan of the cutting-tool. Fig. 4 is a detail transverse vertical section through the mandrel-holder socket and mandrel-flange, looking toward the mandrel. Fig. 5 is a detail transverse vertical section through the mandrel-holder rear recess, looking toward the rear, neither of said Figs. 4 and 5 showing the cutting-tool.

A is the upper section of the mandrel-holder, and B is the under section of the same fitting on the latter.

C is the mandrel, with the vertically and laterally eccentric flange *c* cast rigidly upon its rear end. The chambered socket D is formed on the inner face of section-holder A, and into it said flange snugly fits, said flange being further fastened to said holder by any suitable device, *a*. Said mandrel has the longitudinal slot *c'* formed in its bottom, and extending throughout its entire length, having its top *c''* inclined upwardly and rearwardly from the front end of the mandrel and throughout its entire length. Said slot *c'* continues its course rearwardly, and on the said incline entirely through section A of the mandrel-holder.

E is a longitudinal wedge, of sufficient width to fit snugly but freely in said slot, its upper

edge being provided with the check-mark *e*. Said wedge is provided at its rear end with lug *e'*, perforated with screw-hole, through which works pinching-screw F. The face-plate G is fitted on the rear end of said screw, so as to permit the latter to have free rotation, and yet restrain it from longitudinal movement, said screw being suitably provided with crank-disk H. Holder-section A has formed in it a recess for the accommodation of said screw F, and has said plate G screwed onto its rear open end, which secures fulcrum-power for said screw. Sections A and B are provided with matching tongues J and grooves K, whereby, with screws L, they are locked together. Section A is also provided with the lateral screw-ended bolts M, by which the pinion to be cut with a key-seat is held firmly on the mandrel as it is pushed up closely against flange *c*.

N is the cutting-tool, having its head *n* of greater vertical dimension than the main longitudinal portion of the tool, and of a thickness to work snugly in slot *c'*, said head being provided with cutting-edge *n'*. Said cutting-edge is provided with a clearance, *n''*, very slight, and of form as shown in the drawings. The rearward end, *n'''*, of said tool is flattened, so as to be of less vertical dimension and greater horizontal dimension than the main length of the tool, thereby providing for a spring movement of said tool as it is pressed by the wedge. At the same said end of said tool its shank O is turned at right angles to its main length, forming thereby an arm by which it is to be rigidly attached to the head of the planer. Said tool is to be rigidly set in the cross-head of a common iron planer, and all the balance of the cutter-head is rigidly fastened to the bed of said common iron planer. The mandrel-slot *c'* is the guide for tool N, and by its tight fit against it prevents any lateral deflection of the latter in its work. Said tool, when fitted in the mandrel-slot, is free from contact with the walls of said slot at any point, except at its head, said head being of such increased dimensions over its other contiguous parts that it has its top bearing against the wedge, its sides bearing against the walls of the slot, and its bottom cutting-edge bearing against the work. The bearing of the wedge on the head of the tool and the cutting-edge of said

tool are in the same vertical plane. The said bearing of the cutting-edge of the tool against the work under the advancing pressure of the wedge is provided for by the capacity of the tool to spring downward at its end section, n^3 . It is also to be noticed that by the detachable connection of flange c and mandrel C with the holder any other sized mandrel, with a similar-sized flange, may be used in place of the specific one shown in the drawings; hence pinions of different bores may be respectively fitted on their appropriate sized mandrel without further change of parts, thus providing for the key-seat cutting of different-sized pinions by this convenient changing of one mandrel for another of different size. It will also be noticed that the incline of the wedge-seat in the mandrel is not as great as the taper of the wedge, and this sets the bottom of the wedge at a slight incline, and gives the desired taper to the key-seat to be cut.

The operation of my invention is as follows: Wedge E being permanently located in c' , a pinion slid over the mandrel is brought up close against flange c , and there firmly locked by appliances in connection with lateral screw-ended bolts M . The cutting-tool is then entered into said slot from the free end of the mandrel for its work, and the wedge being adjusted at a proper point for its first bearing upon the cutting-head of the tool the first inward stroke of said tool takes the first chip from the inner periphery of the pinion. The tool being then retracted, the wedge is adequately advanced by means of the pinching-screw, so that the second stroke of the tool will take a second chip from the pinion, and so on in successive advances of the wedge and successive strokes of the cutting-tool until the required depth of the seat is acquired, which may be indicated by a check-mark on the upper edge of the wedge as the point of said wedge protrudes beyond the free end of the mandrel.

What, therefore, I claim is—

1. In a key-seat cutter, a cutting-tool, N , provided with portion n^3 , of less vertical dimension than the main longitudinal body portion of the tool, substantially as set forth.

2. In a key-seat cutter, a cutting-tool, N , provided with flattened portion n^3 , of less vertical and greater horizontal dimensions than the main longitudinal body portion of the tool, substantially as set forth.

3. In a key-seat cutter, a cutting-tool, N , provided with flattened portion n^3 in its longitudinal body, and with angular shank O , substantially as set forth.

4. In a key-seat cutter, a cutting tool, N , having a head, n , of greater vertical dimension than the main longitudinal body portion of the tool, substantially as set forth.

5. In a key-seat cutter, the combination of

the slotted mandrel, wedge, and cutting-tool, said wedge having bearing on the cutting-tool only on the latter's head in a vertical plane substantially with the cutting-edge, the remaining longitudinal body of the cutting-tool being clear of the wedge, substantially as set forth.

6. In a key-seat cutter, the combination, with a mandrel-holder, A , having its face provided with chambered socket D , of a mandrel, C , having its rear extremity provided with eccentric flange c , fitting in said socket, substantially as set forth.

7. In a key-seat cutter, the combination, with the mandrel-holder A , having its front end face provided with chambered socket D , of mandrel C , having its rear extremity provided with the vertically and laterally eccentric flange c , and fastening devices a , which secure said flange to the socket, substantially as set forth.

8. In a key-seat cutter, the combination, with a mandrel formed with a longitudinal and inclined slot, and a wedge adjustably movable in said slot, of a cutting-tool working in said slot, and having its cutting-head of both horizontal and vertical increased dimensions over the other immediately-adjacent portions of said tool, substantially as set forth.

9. In a key-seat cutter, the combination, with a mandrel formed with a longitudinal slot, of a cutting-tool working in said slot and having its head of greater horizontal dimension than the remaining portion of the tool that works in the slot, whereby said head only has bearing against the walls of the slot, substantially as set forth.

10. In a key-seat cutter, the combination, with a mandrel-holder having a chambered socket on its inner face, of a mandrel provided with a flange detachably fitting in said socket, substantially as set forth.

11. In a key-seat cutter, the combination, with mandrel-holder A , provided with rear recess, I , of wedge E , fitted in said recess, and provided with lug e , and pinching-screw F , working in and through said lug, substantially as set forth.

12. In a key-seat cutter, the combination, with mandrel-holder A , provided with rear recess, I , of wedge E , fitting in said recess, and provided with lug e' , and pinching-screw F , working through said lug, and perforated face-plate G , through which the shank of said screw works, substantially as set forth.

In testimony that I claim the foregoing to be my invention I have hereunto set my hand this 3d day of November, A. D. 1885.

ARZA M. BENSON.

Witnesses:

T. B. HALL,

W. B. CLEVELAND.