

(No Model.)

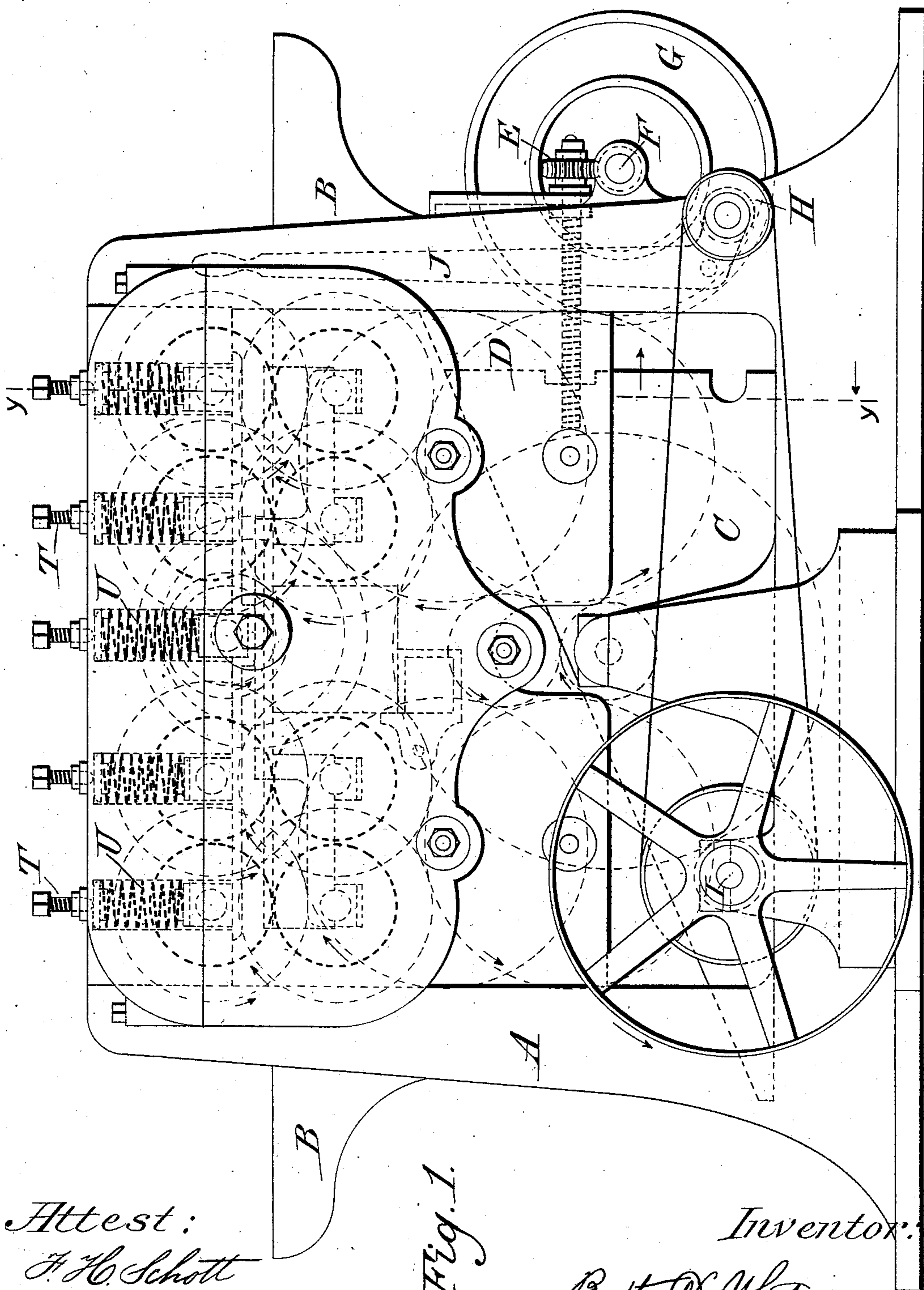
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B. D. WHITNEY.

MACHINE FOR SMOOTHING WOOD SURFACES.

No. 351,676.

Patented Oct. 26, 1886.



Attest:
F. H. Schott
Fred E. Tasker.

Fig. 1.

Inventor:
Baxter D. Whitney,
per J. C. Tasker, atty.

(No Model.)

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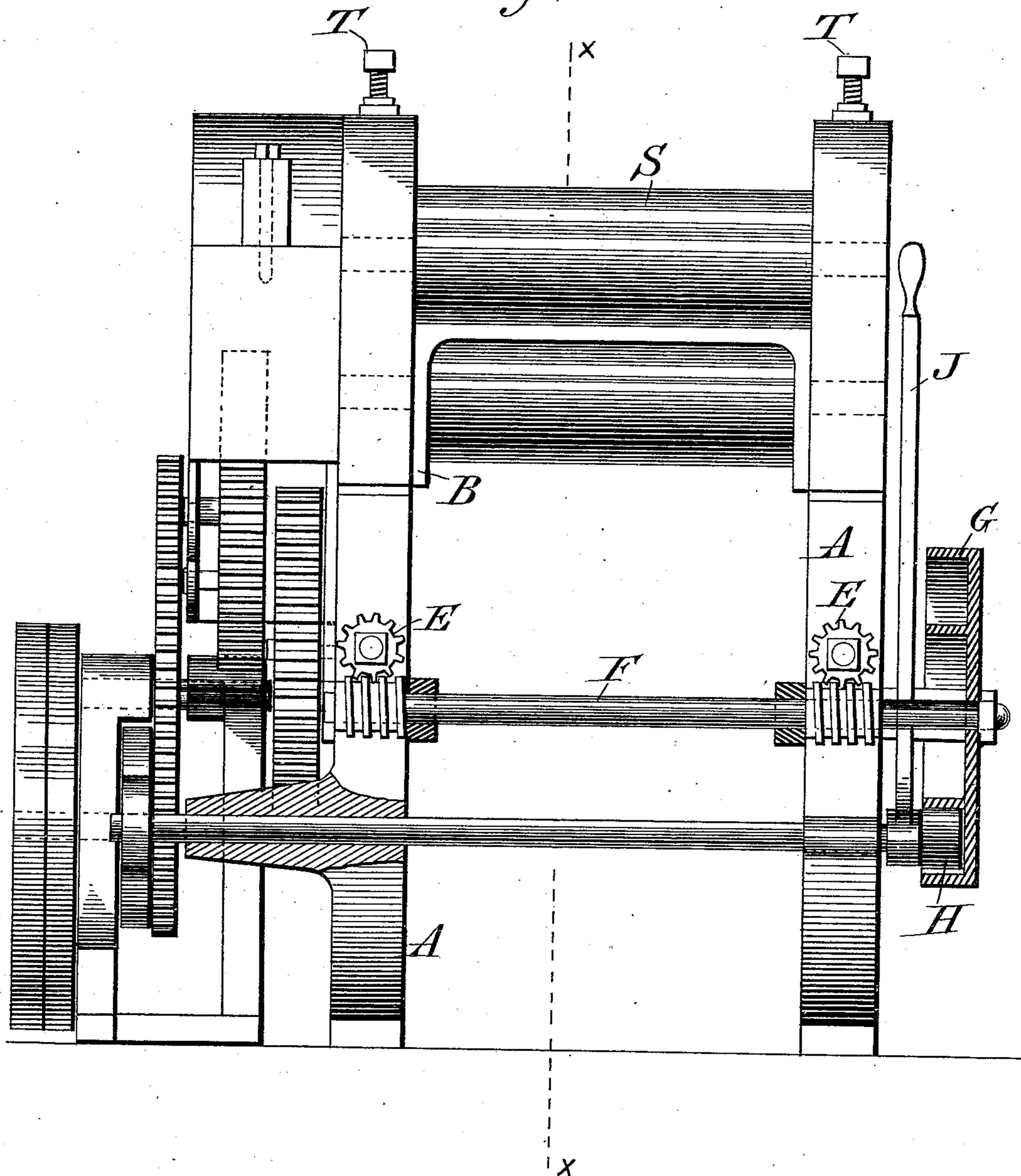
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Fig. 2.



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Fred E. Parker

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(No Model.)

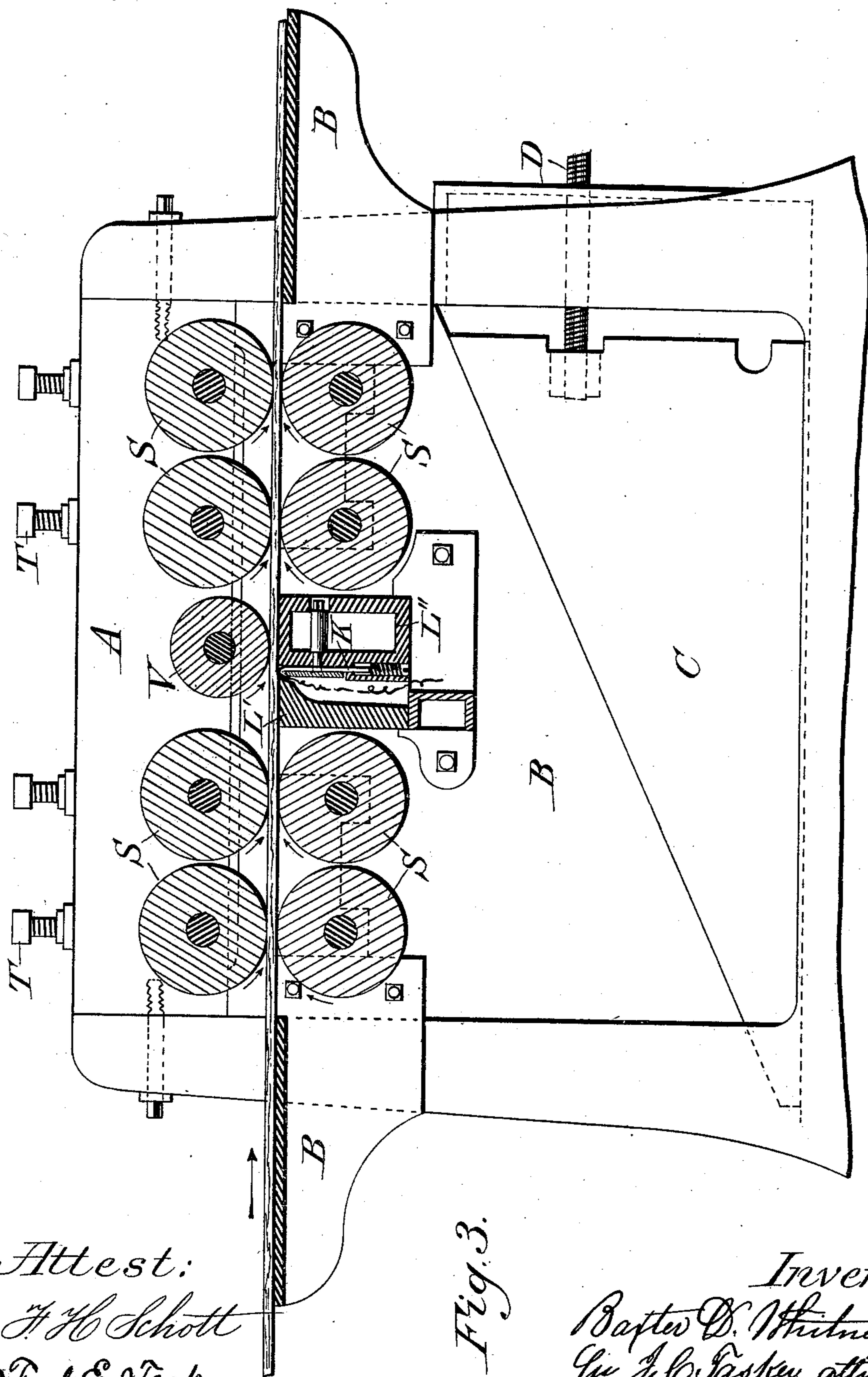
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Fig. 4.

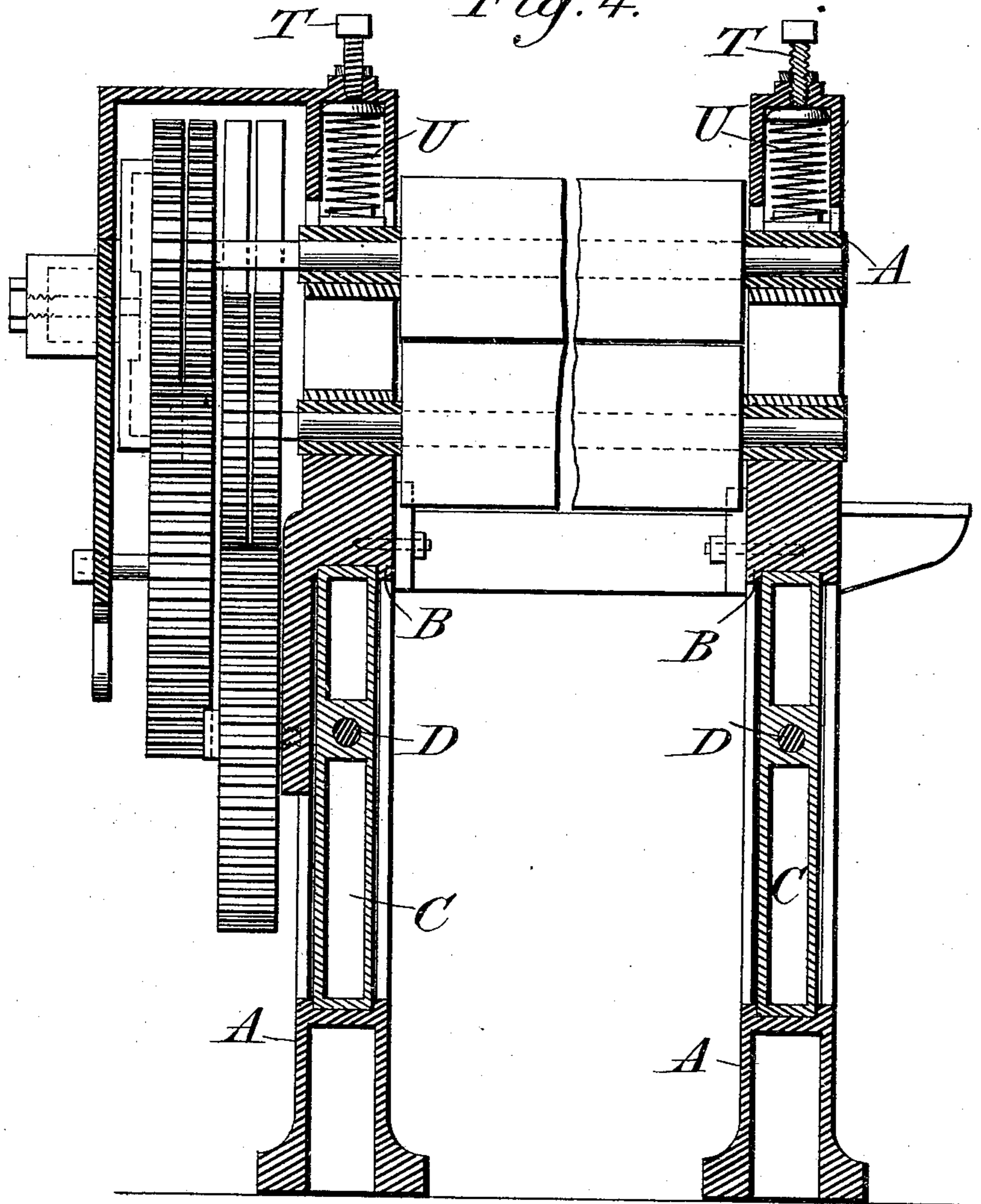
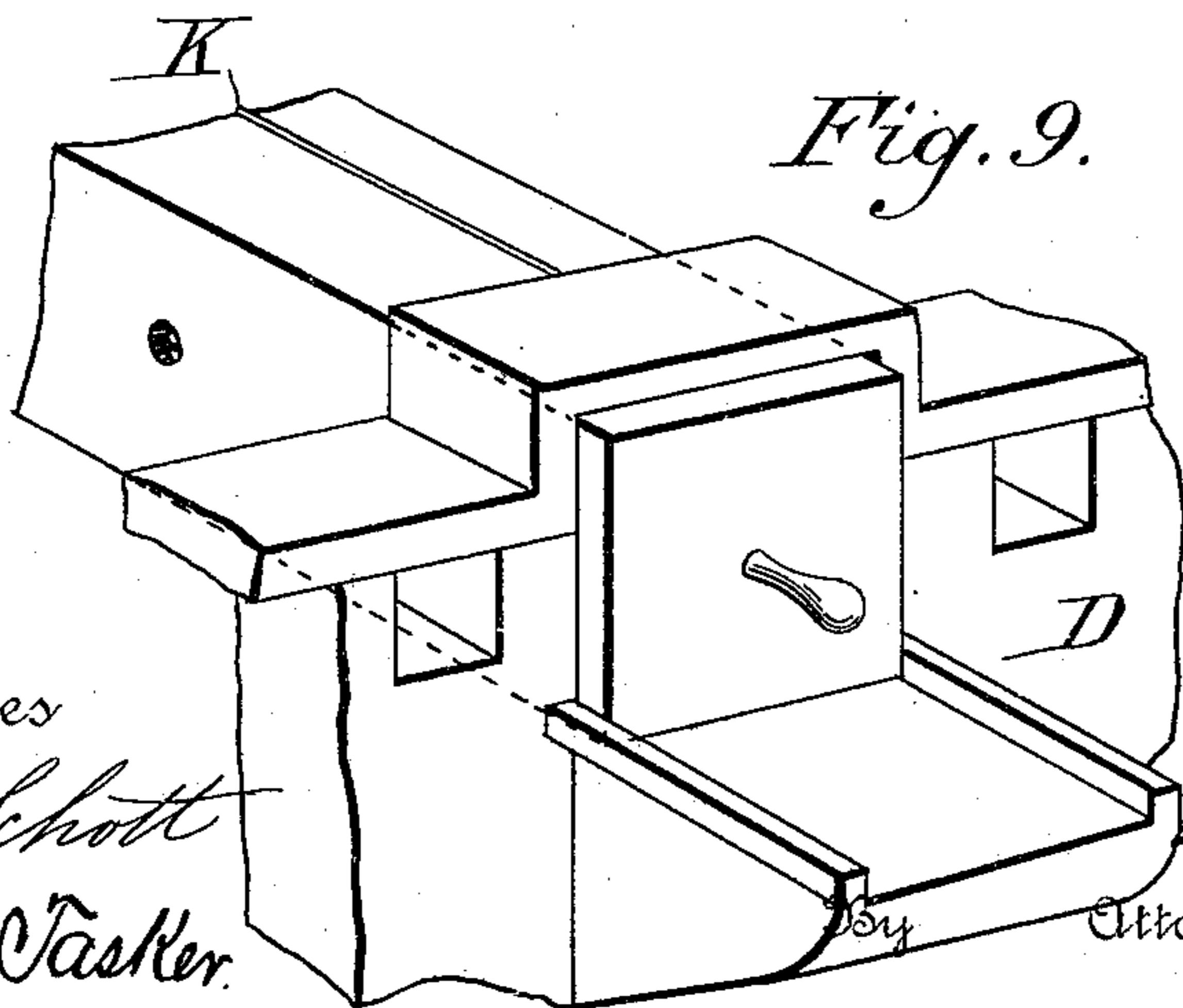


Fig. 9.



Witnesses
F. H. Schott
Fred C. Tasker

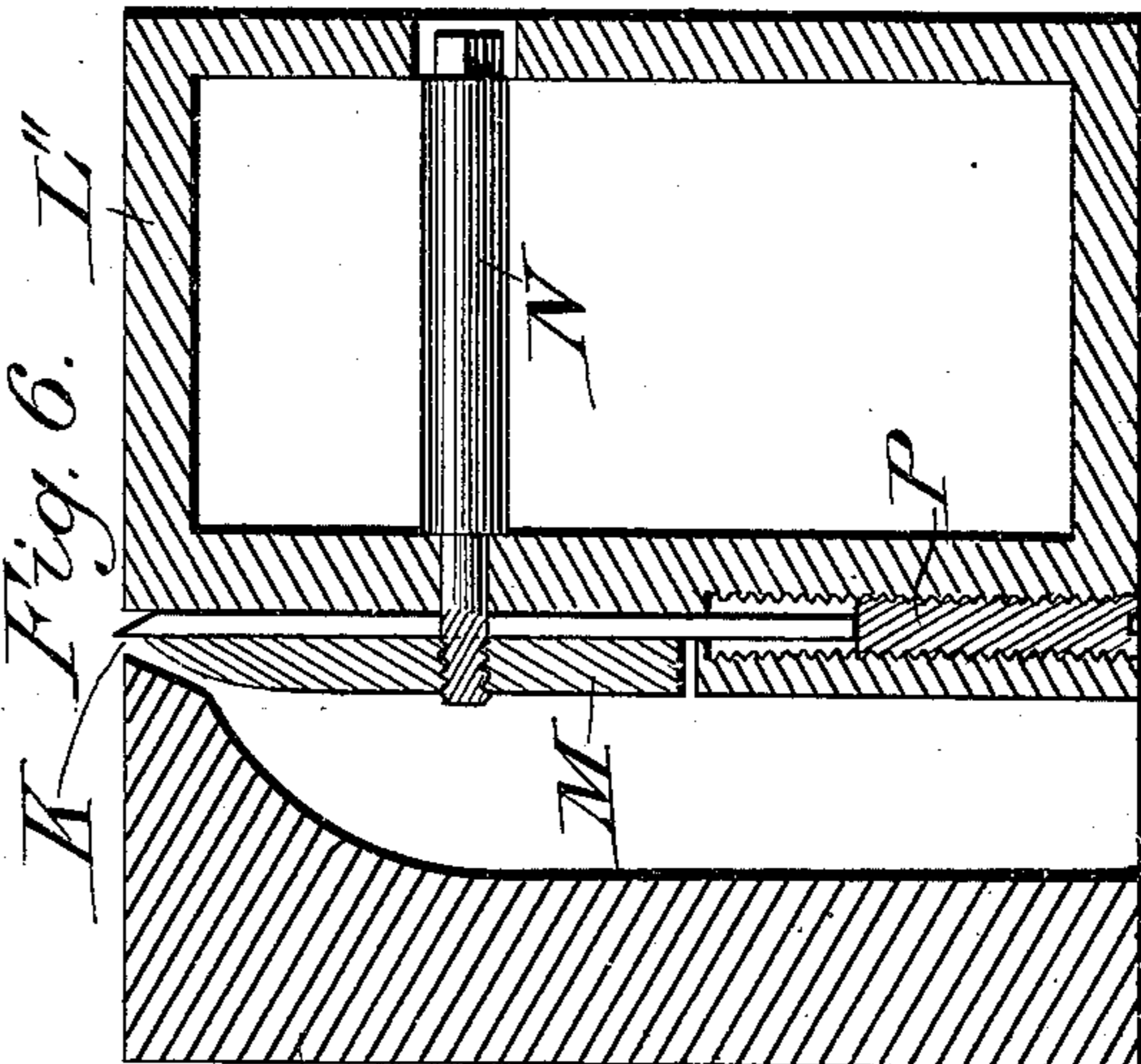
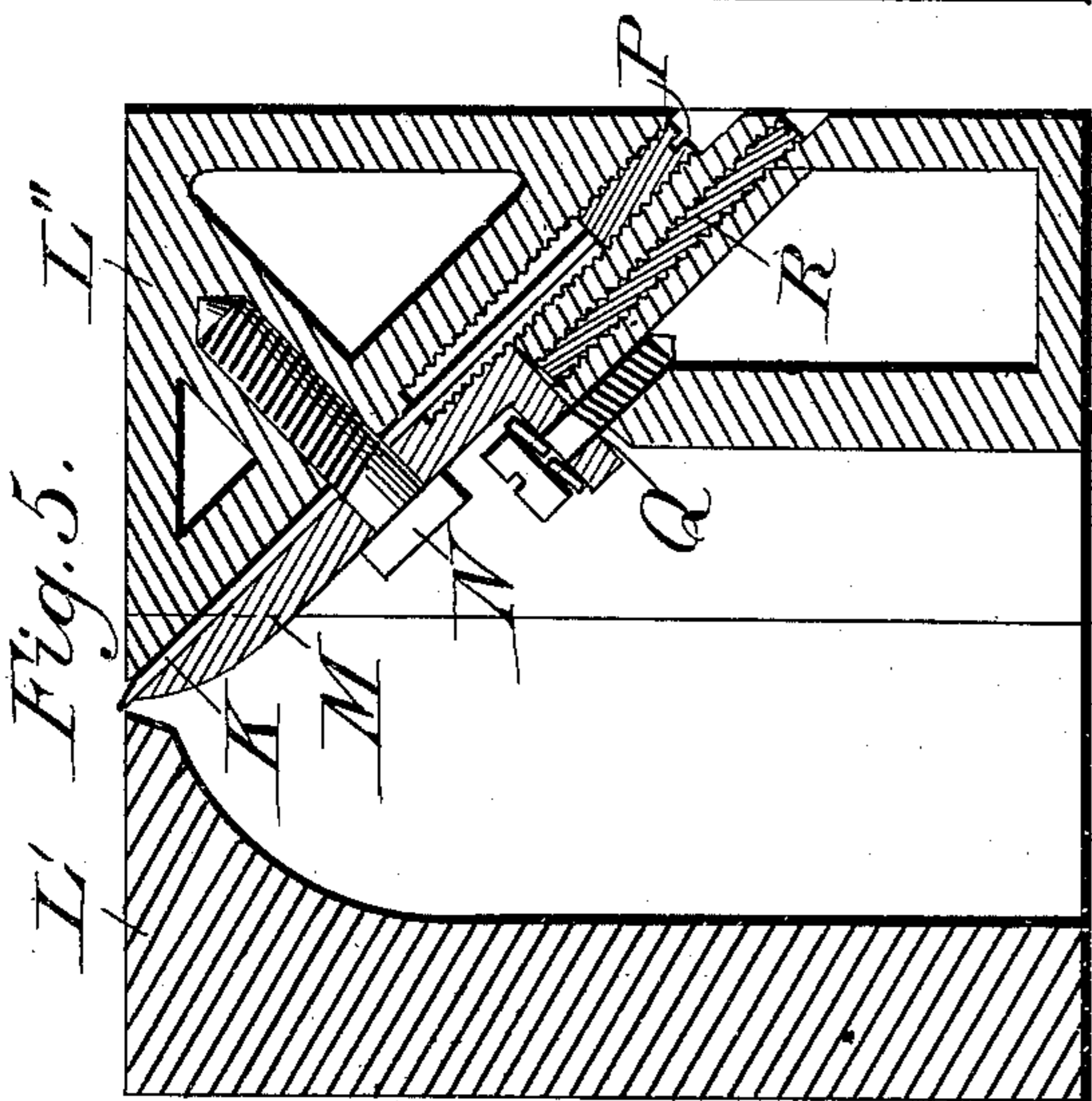
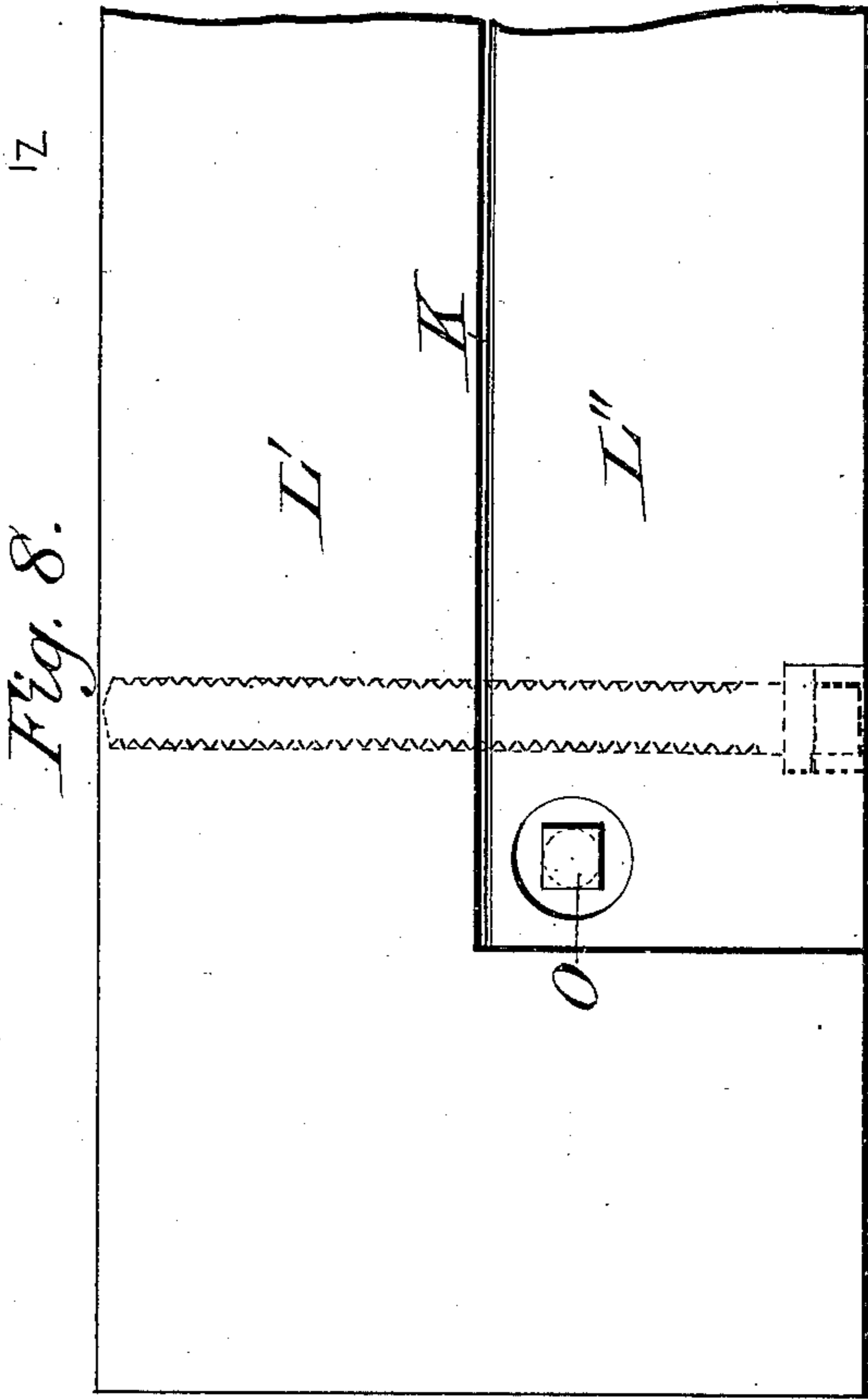
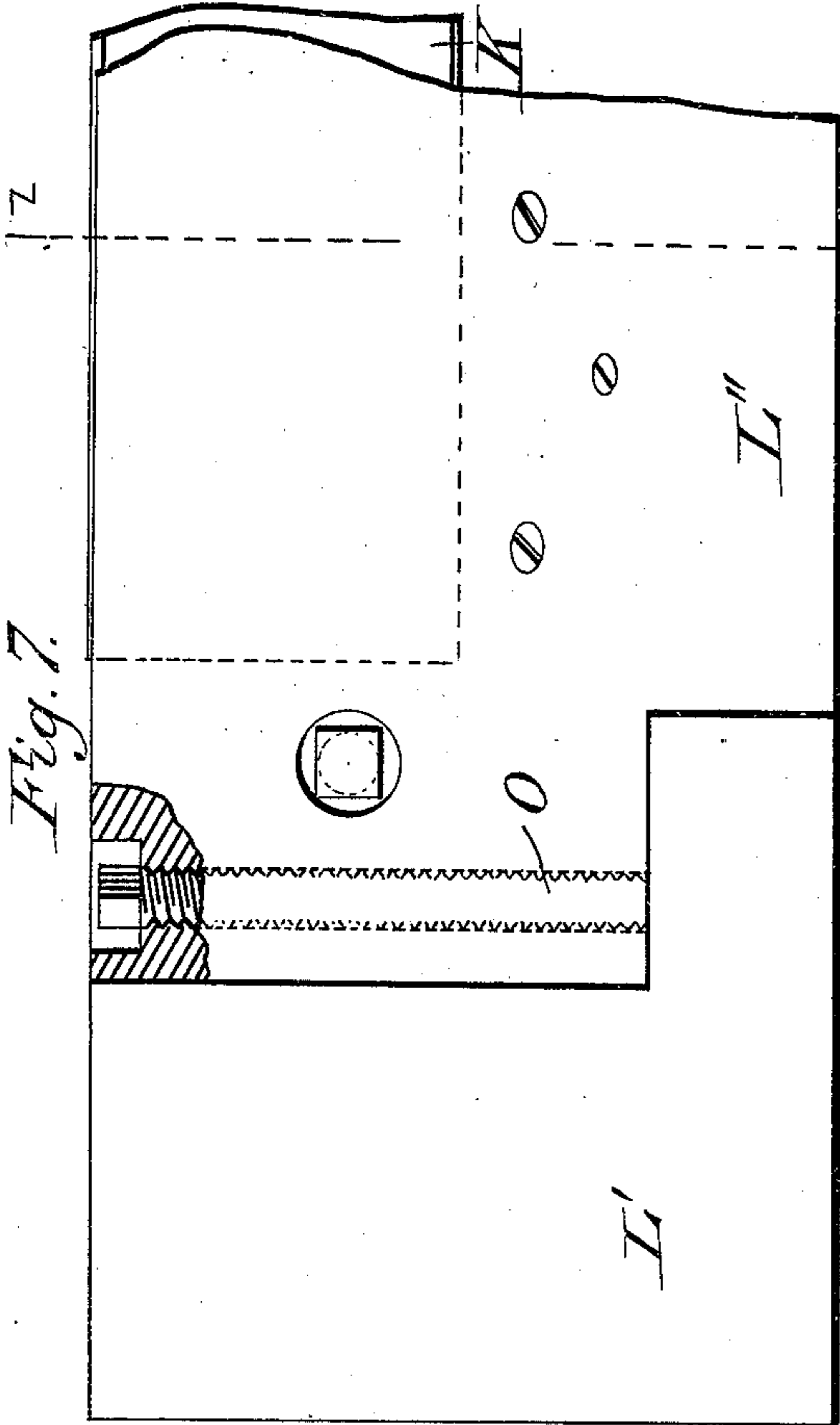
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UNITED STATES PATENT OFFICE.

BAXTER D. WHITNEY, OF WINCHENDON, MASSACHUSETTS.

MACHINE FOR SMOOTHING WOOD SURFACES.

SPECIFICATION forming part of Letters Patent No. 351,676, dated October 26, 1886.

Application filed January 30, 1886. Serial No. 190,299. (No model.)

To all whom it may concern:

Be it known that I, BAXTER D. WHITNEY, a citizen of the United States, residing at Winchendon, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Machines for Smoothing Wood Surfaces; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to a machine for fine planing or smoothing boards or other articles of wood by the removal of a comparatively light and (as nearly as practicable) a continuous shaving or layer of the material acted upon, so that the resulting surface may be more even, uniform, and smoother than that produced by planing-machines with the "dip-and-lift" cut, or by other means usually employed in the preparation of lumber; and it is particularly applicable to the re-dressing of stock which has been reduced to a uniform thickness (or as nearly a uniform thickness as is usually obtained) by the ordinary cylinder-planer or other means.

The invention consists of a cutting tool or blade with appliances for its adjustment and retention in a fixed position, and with a series of feeding-rollers and pressure devices for bringing the material to be acted upon into contact with the cutting-tool in a manner better suited to the proper accomplishment of the work than by methods heretofore in use, as will more fully appear in the detailed description of the machine, which is represented by the accompanying drawings, making a part of this specification, in which--

Figure 1 is a side elevation of the machine. Fig. 2 is an end elevation. Fig. 3 is a vertical longitudinal section on line *x x* of Fig. 2. Fig. 4 is a vertical transverse section on line *y y* of Fig. 1. Fig. 5 is a cross-section of the cutter-stock with a "planer-iron" blade set at an angle of forty-five degrees from the line of cut. Fig. 6 is a similar section of a stock with a "scraper-blade" at right angles to line of cut as used for smoothing some varieties of

work. Fig. 7 is a side elevation of one end of a tool-stock. Fig. 8 is a top view of same. Figs. 5 to 8 are drawn on a scale about three times larger than Figs. 1 to 4. Fig. 9 is a perspective of the withdrawable tool-stock.

Like letters of reference indicate like parts in all the figures.

The main frame-work of the machine is indicated by the letter A.

B represents a vertically-adjustable bed-plate or table, upon which the stuff to be planed is passed through the machine. It is situated between the sides of the frame and held in its lateral position by suitable guideways contacting therewith. It is made with inclined feet seated upon two inclined planes or wedges, C C, whereby it may be adjusted and held at any desired height, the adjustment being made by a longitudinal movement of the wedges C C by means of screws D D, spiral wheels E E, and worm-shaft F, which is worked in either direction by friction-wheels G and H as the latter (revolved by band-wheels, &c., from the main drive-shaft I) is made to contact with the internal or external faces of G by tilting the vibratory lever J, in which the shaft of H is journaled.

K represents a cutting tool or blade, which may be made of steel plate, properly tempered, and fitted and fixed in a tool-stock made in two principal parts, L' and L'', said tool being fastened by means of a clamping-plate, M, and screws N N to part L'', which is vertically adjustable in its relations to L' by screws O O, so that the difference in the planes of the top faces of the two parts will correspond to and serve as a gage for the thickness of the shaving or lamina of material to be removed from the board or article to be planed; and said faces will likewise serve as bearings or supports in close proximity to the cutter for the unfinished and finished surfaces of the board, to hold and guide it steadily and correctly for a proper cut, thereby insuring more uniform and perfect work than would be accomplished without such adjustment of the surfaces just in front and back of the blades, which should be set so that its cutting-edge will correspond with the face of L'', or the part at the rear of the blade which contacts with the finished surface of the work. For such adjustment of the blade K, screws P are provided, while screws

Q and R are for adjusting the clamping-plate M, which may be used as a cap-iron or chip-breaker for K, when desired. For cutting soft lumber the blade K may be placed at an angle of about forty-five degrees from the line of cut, as represented by Fig. 5, and for harder woods, or those with irregular grain, it may be advantageously used at a greater divergence, or at right angles to the face of the stock, as shown in Fig. 6. In this case it has its edge turned to act as a scraper, which produces a fine surface on some varieties of work. This tool-stock is mounted in the bed-plate B with the cutting-edge of blade K extending transversely across the surface of the table. For convenience in exchanging, sharpening, and adjusting blades, the stock is withdrawable from the side of the machine, and when set for use it may be held in position by set-screws, wedges, or other suitable retaining devices. (See Fig. 9.)

The letters S designate the feeding-rollers for carrying the stuff to the cutter and through the machine. The number and arrangement of these may be suited to the strength of feed required, one or two pairs being sufficient, perhaps, for light work, while four pairs, (as shown,) or more, perhaps, may be needed in other cases. They may be rotated by any suitable system of gearing to transmit the requisite motion, which need not be particularly described here, such a system (as indicated by dotted lines in Fig. 1) being the subject of a separate application for Letters Patent. Each lower roll is journaled in the bed-plate B, and is vertically adjustable therewith. Their position relative to the table is such as will guide the "work side" of the board in the right plane to approach and leave the cutting-tool correctly. The upper rollers are mounted in spring-pressure hangings connected with frame A, which have tension-screws T T T T, bearing upon springs U U U U, to regulate the pressure upon the boards and grip them sufficiently to carry them over the cutter. These rollers S, for the propulsion and general guidance of the boards, &c., through the machine, are properly made of metal or rigid material retaining a correct line. It is necessary, however, to hold the board in contact with the cutting-tool just at the point where it is making the cut. For this purpose plates or bars of metal or rigid material have heretofore been placed to bear upon the back or reverse side of the board opposite the cutters. If the pieces to be worked were always of uniform thickness and contour this might suffice; but with inaccuracies incident to the imperfections of the preliminary preparation that is seldom the case, and as a very fine cut leaves a much nicer surface than a coarse or heavy chip, it is expedient to gage the thickness of the shaving entirely from the face or work side of the board rather than partly from the opposite side, as must be the case with a non-elastic support, which as heretofore used has made

it necessary to remove a shaving of inordinate thickness in some places, in order to make the cut continuous and dress the entire surface of the board. To obviate this defect of former mechanism, and to compensate for the imperfections of stock to be dressed, I have devised, and now apply to the reverse side of the board or article being planed at a point directly opposite or against the cutting-tool, an elastic pressure device arranged to hold the face or work side of the board closely to the surfaces of the tool-stock L' L', to overcome the irregularities of thickness and contour of the stock, so that a very thin and continuous shaving may be removed from the outside of the material and the resulting surface be left with a nicer and more perfect finish than can otherwise be obtained, while the work of the cutter is greatly reduced, and it is thereby enabled to hold a sharp edge much longer than with a less delicate adjustment and cut. This compensating pressure device may be applied in the form of a variably-yielding spring or springs arranged to bear upon the board at different points in its width, or it may be in the form of a "broken," jointed, or elastic rollers. As the last mentioned is quite as practicable and easy to apply and offers less resistance to the passage of the board, while if geared it may aid in that line, it is in many respects preferable to other modifications suggested, and I have represented the device in the drawings in the form of a roller, V, which may be made of spring, rubber, or other elastic material which will adapt itself to the work and exert sufficient pressure wherever required, and such a roller properly made and applied constitutes a very effective device for the purpose described.

The machine in operation has its feeding-rollers rotated by a band-wheel on shaft I, from which motion is transmitted through the system of gear-wheels connecting the several rolls therewith, the table B, with the cutting-tool and its appliances, and the rolls connected thereto, being adjusted to suit the thickness of the article to be operated upon. Said article or material is introduced between the upper and lower rollers, and is carried by them to the cutting-tool, where it receives the pressure of the elastic roll V, which acts upon each point of its transverse section to hold it firmly to the face of the tool-stock, so that a very thin and continuous shaving or layer of the material is taken off from the entire surface of the board or other article, leaving it with a nice, even, and smooth surface, well suited for the fine finish used for various purposes for which the work of the machine is designed and employed. The cut is nicely gaged and the piece acted upon correctly guided by the adjustable-faced tool-stock and compensating pressure device, so that a finer shaving and nicer cut are made than is possible without these appliances, which add materially to the efficiency of the machine and the excellence of its execution.

Having thus described mechanism to which my improvements are applicable, I claim as my invention—

5 1. In a smoothing-machine, the combination of the tool-stock consisting of the parts L' and L'', vertically adjustable with respect to each other, having a cutting-blade, K, adjustable by means of the screws P, and the clamping-plate M, adjustable by means of the screws
10 Q and R, all arranged substantially in the manner and for the purpose specified.

2. In a smoothing-machine, the combination, with the adjustable cutting-tool K, having a tool-stock consisting of the parts L' and
15 L'', vertically adjustable with respect to each other, of an equalizing pressure-roll, V, or

other equivalent pressure device, arranged directly over the cutting-tool, substantially as specified and shown.

3. In a smoothing-machine, the combination 20 of the vertically-adjustable table B, the sliding inclined planes C C, screws D D, spiral wheels E E, worm-shaft F, and friction-wheels G and H, arranged and operated by lever J substantially as and for the purpose shown 25 and described.

In testimony whereof I affix my signature in presence of two witnesses.

BAXTER D. WHITNEY.

Witnesses:

FRED E. TASKER,
E. L. WHITE.