

No. 696,168.

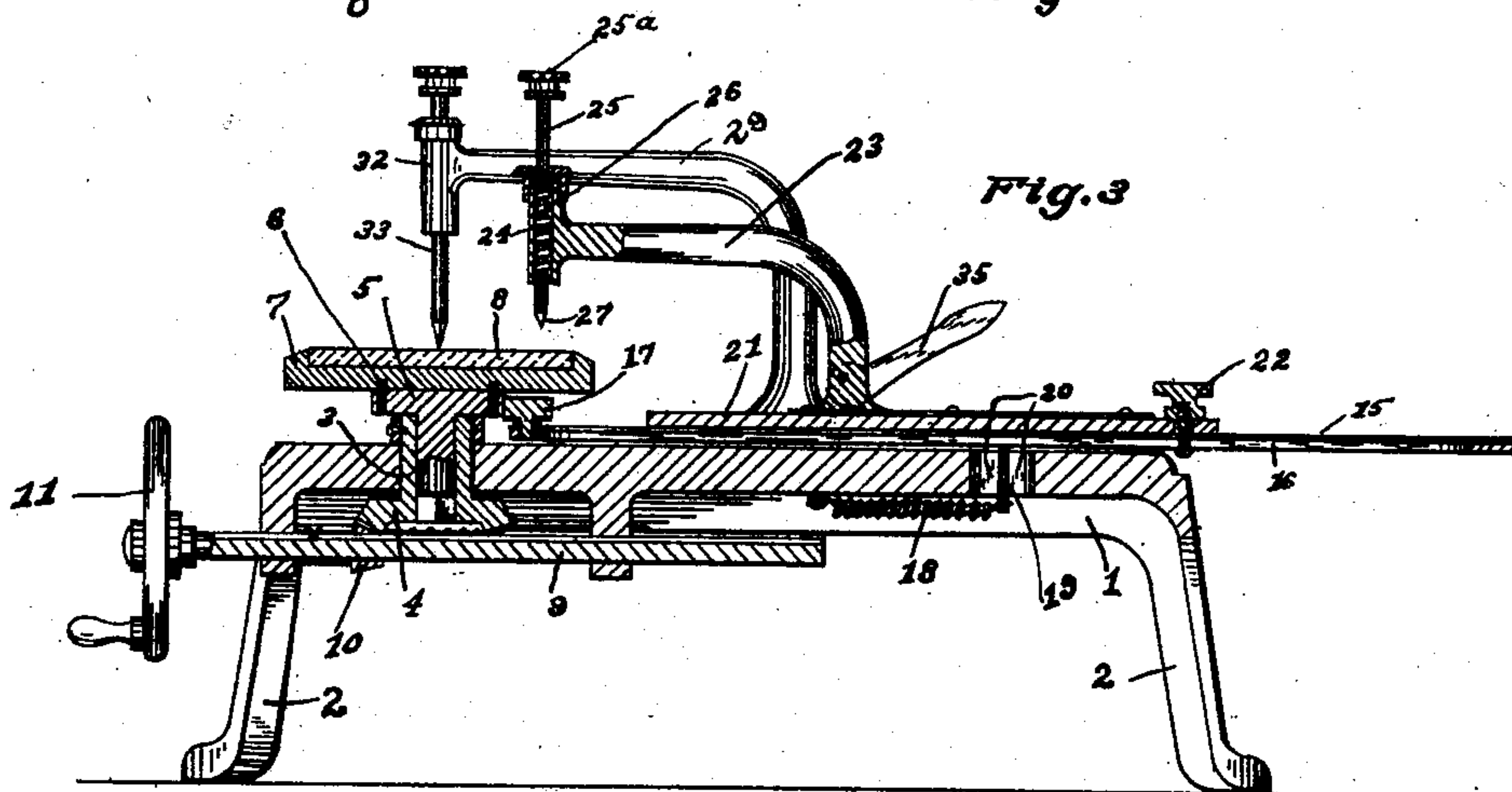
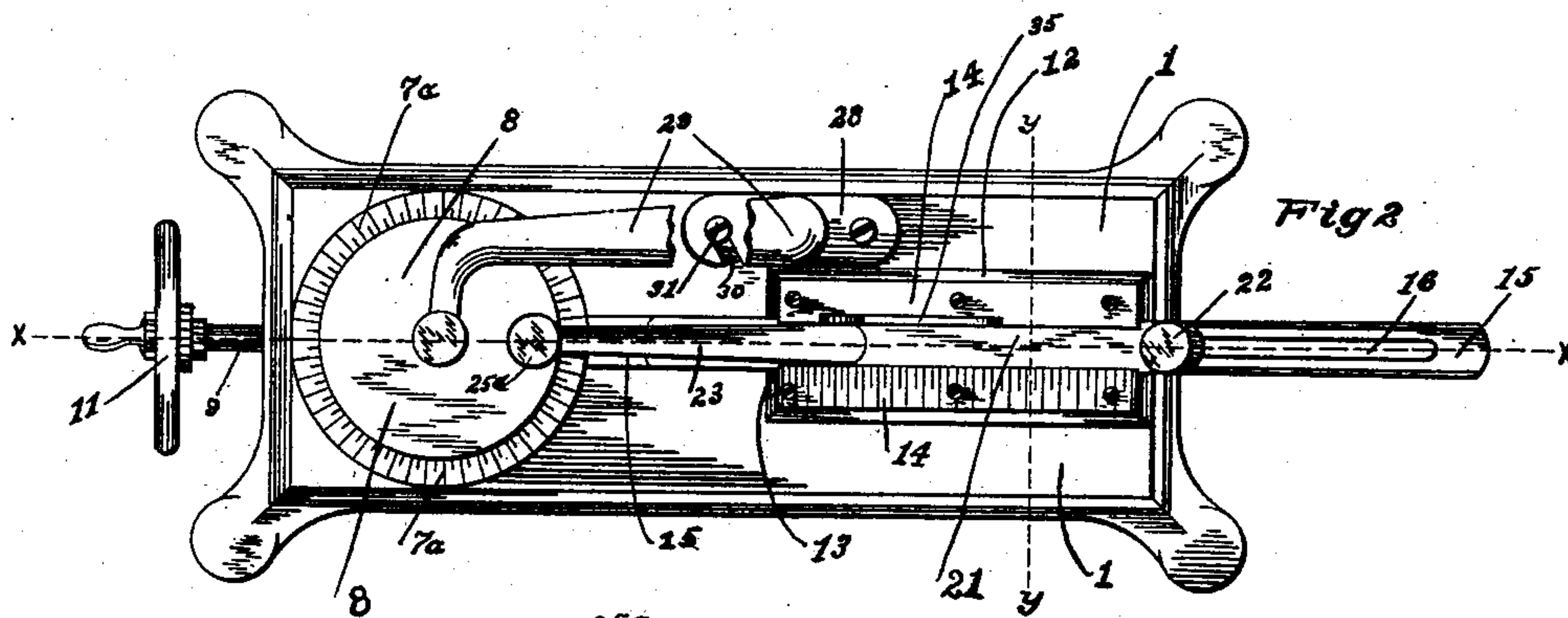
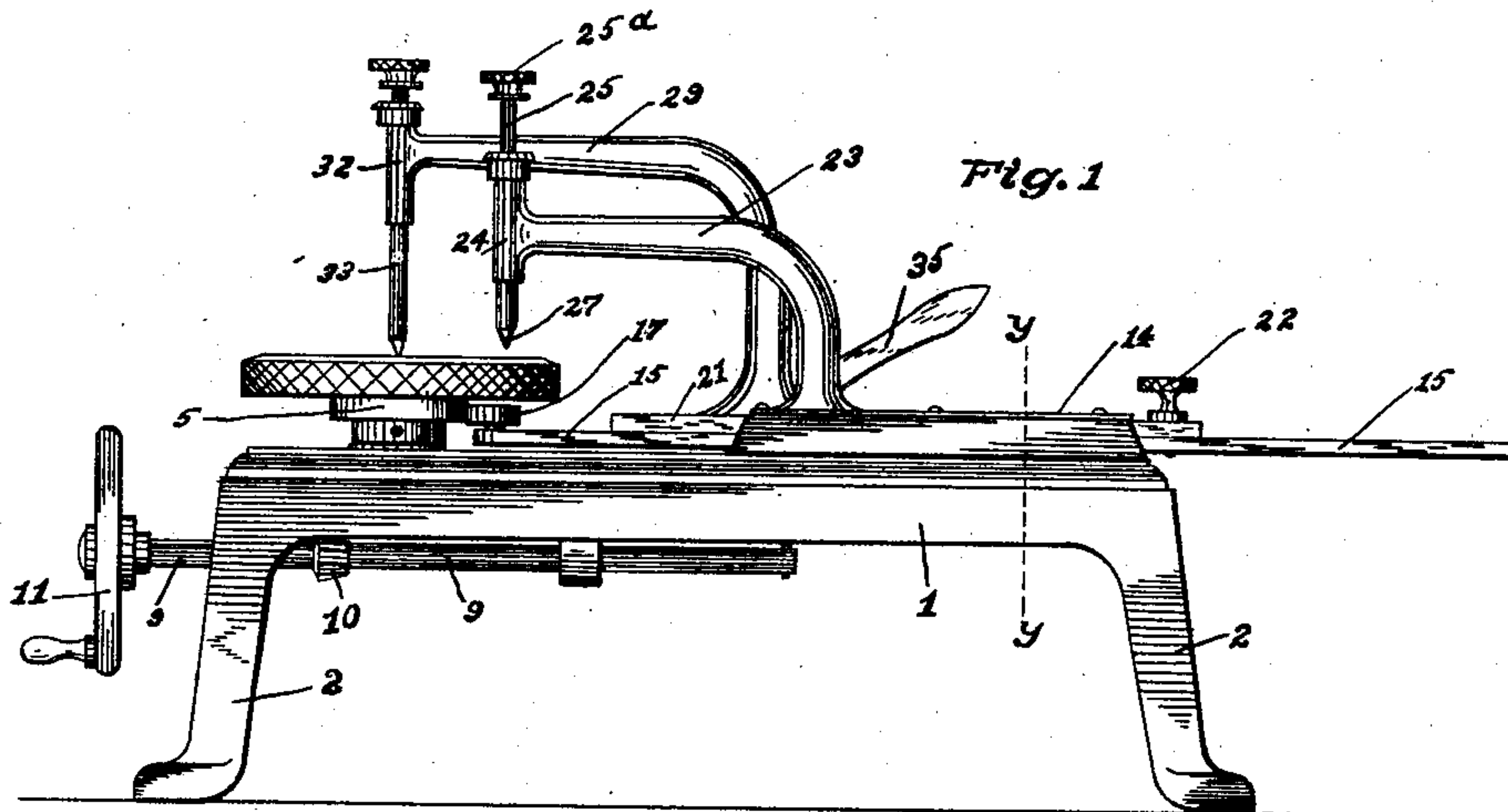
Patented Mar. 25, 1902.

G. W. FOWLE.  
LENS CUTTING MACHINE.

(Application filed Nov. 29, 1901.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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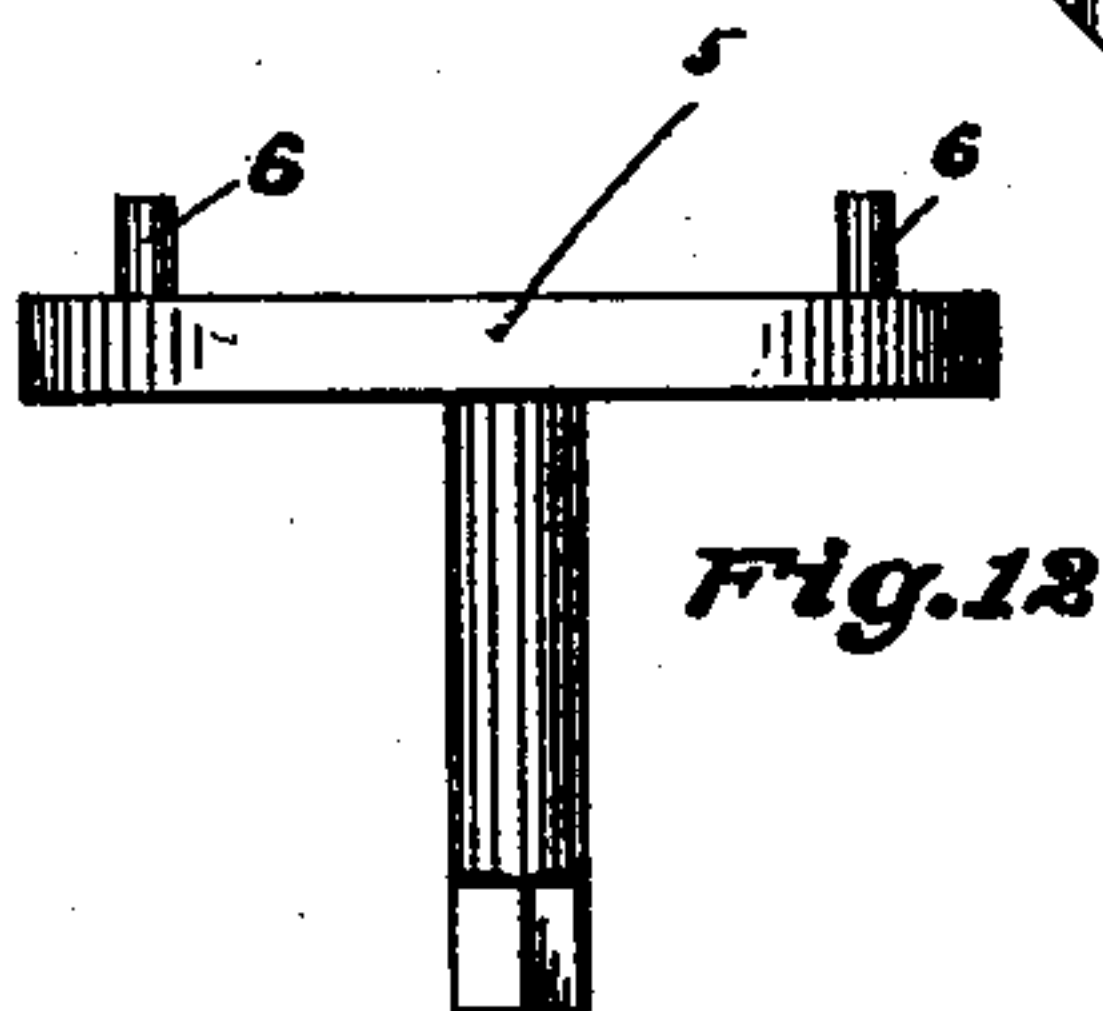
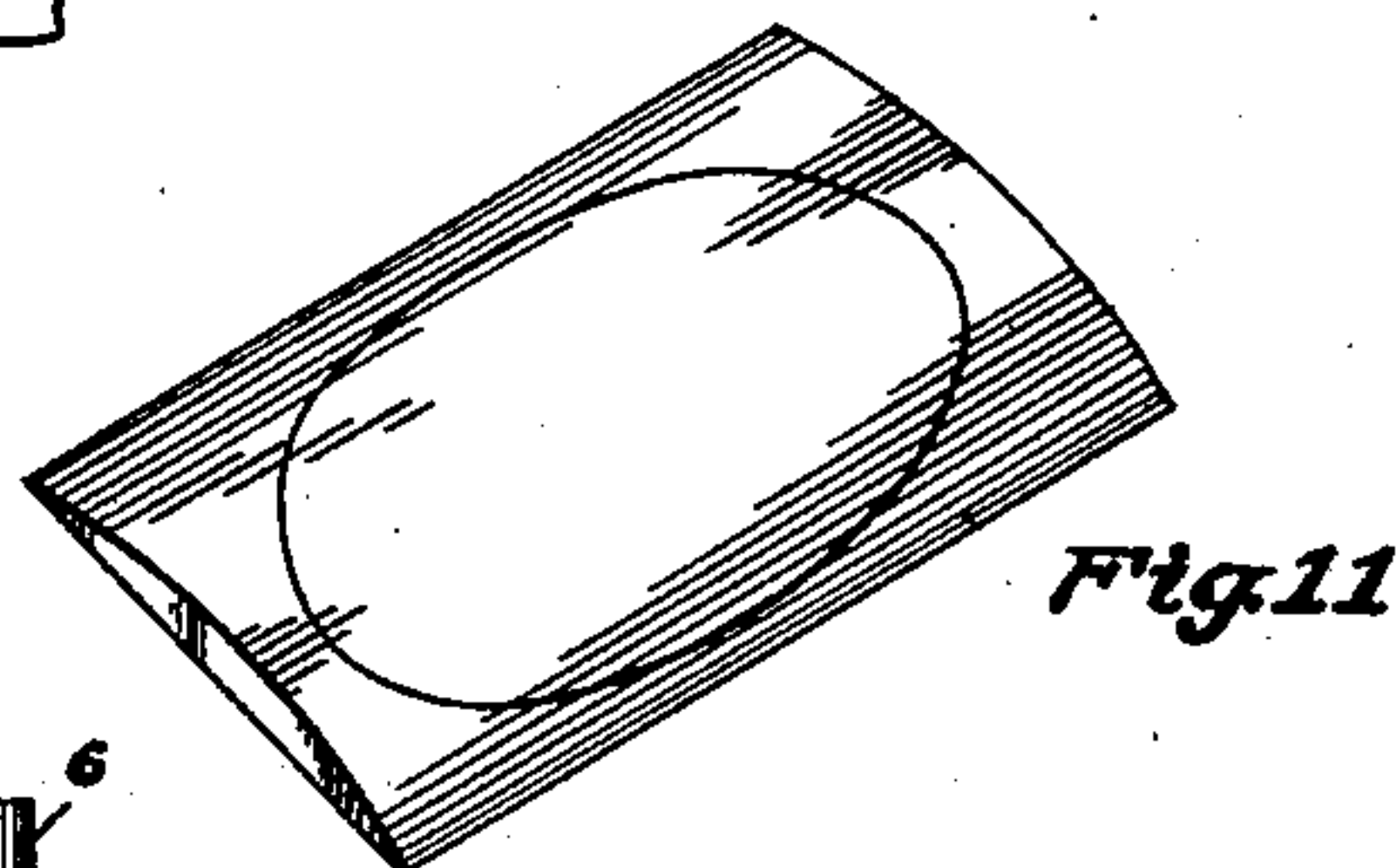
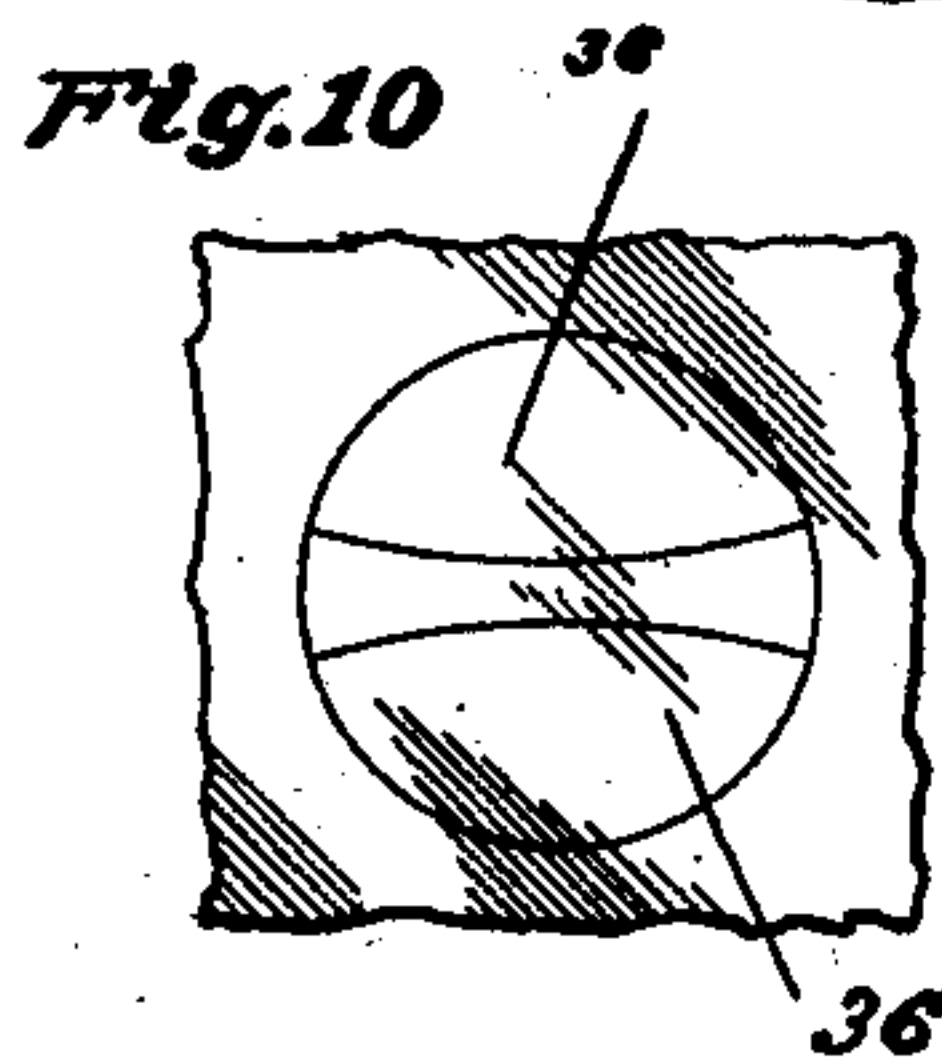
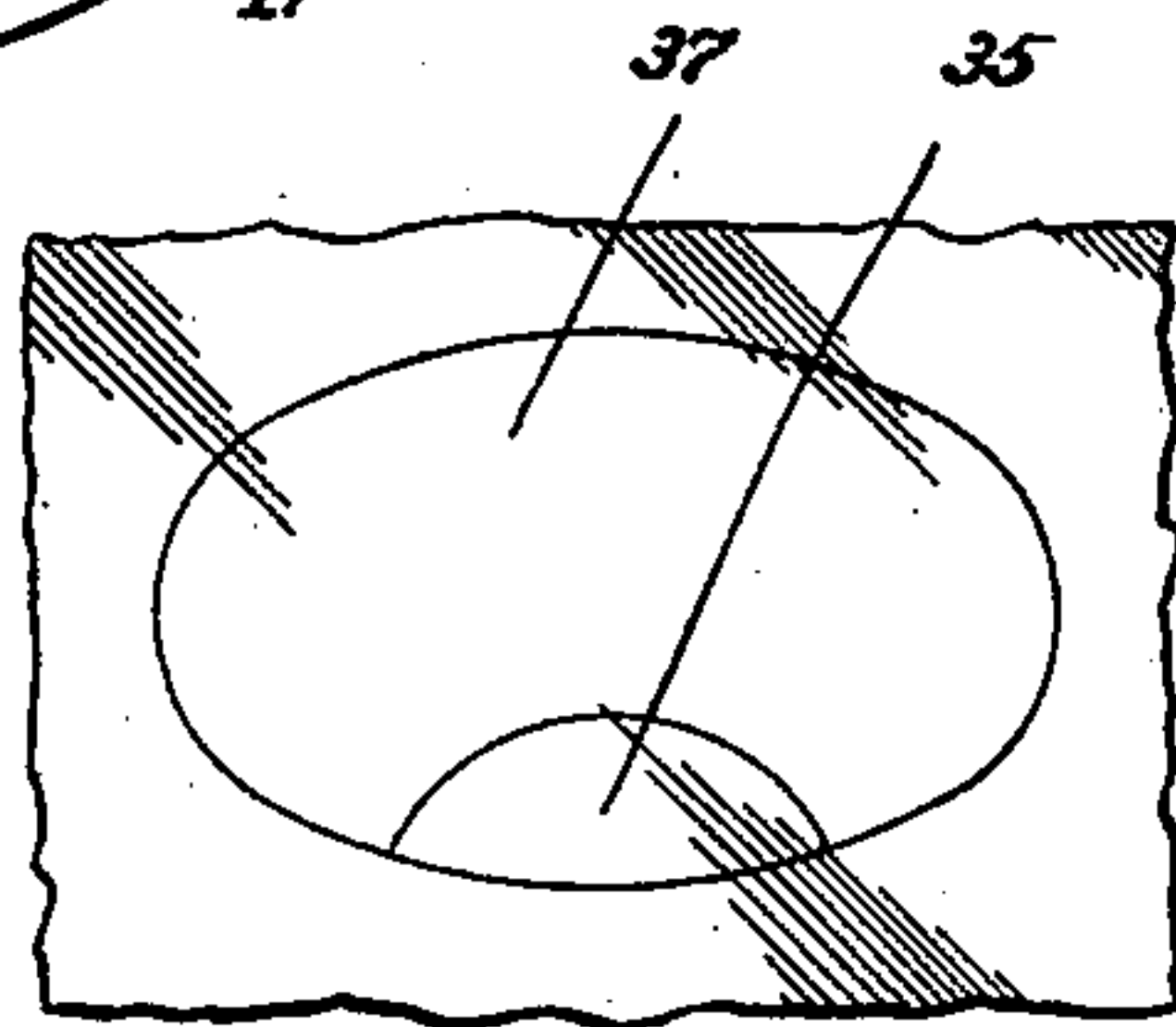
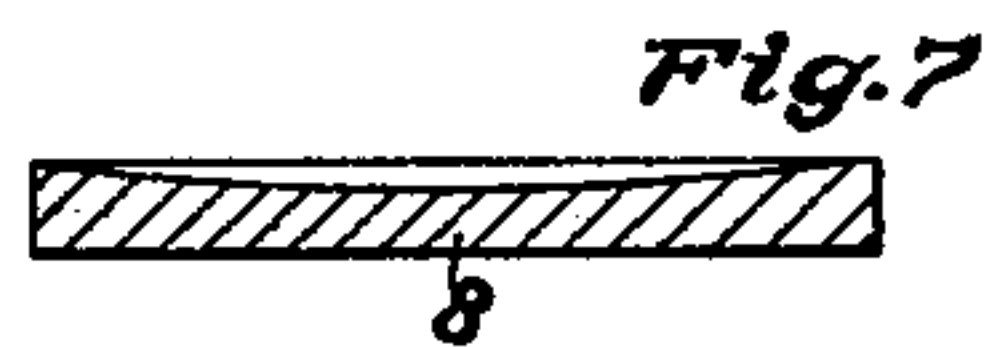
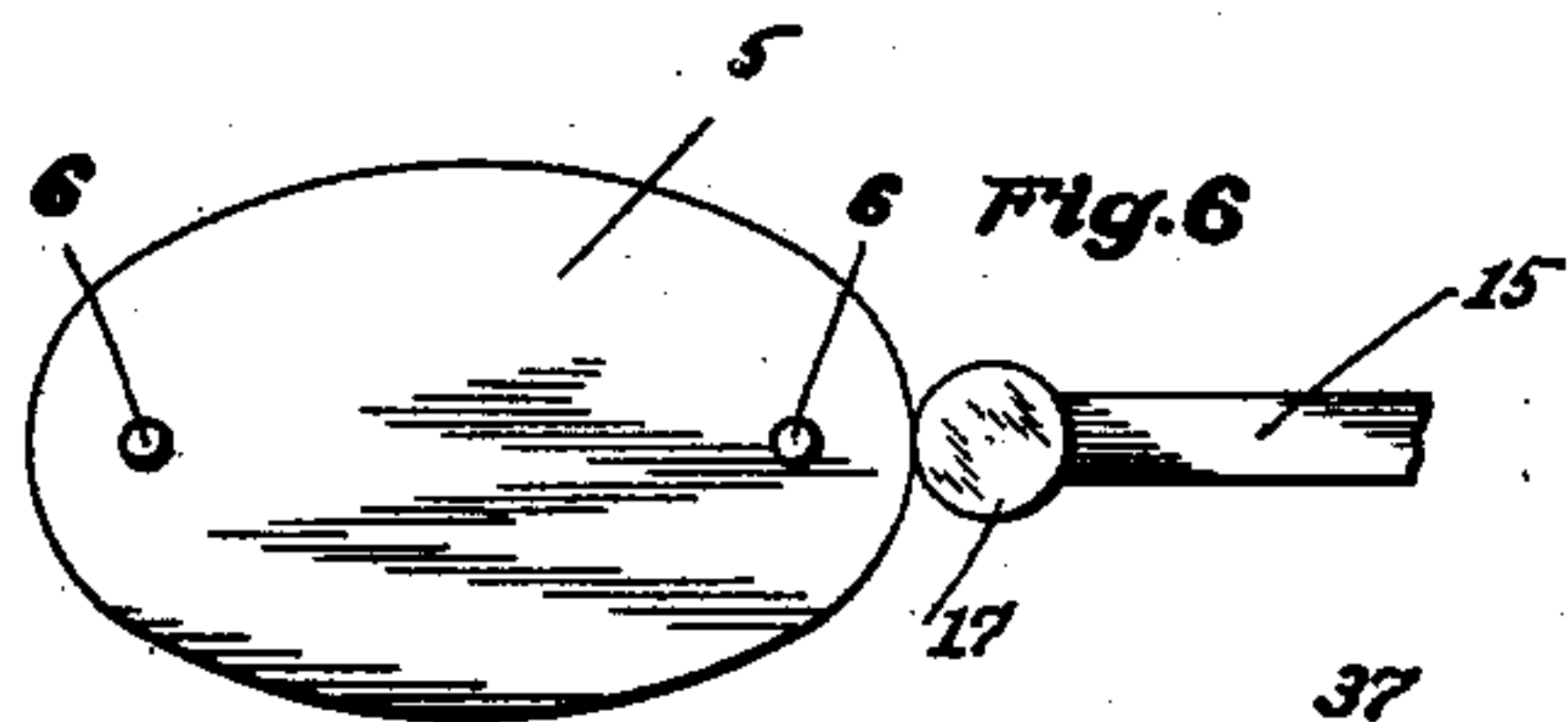
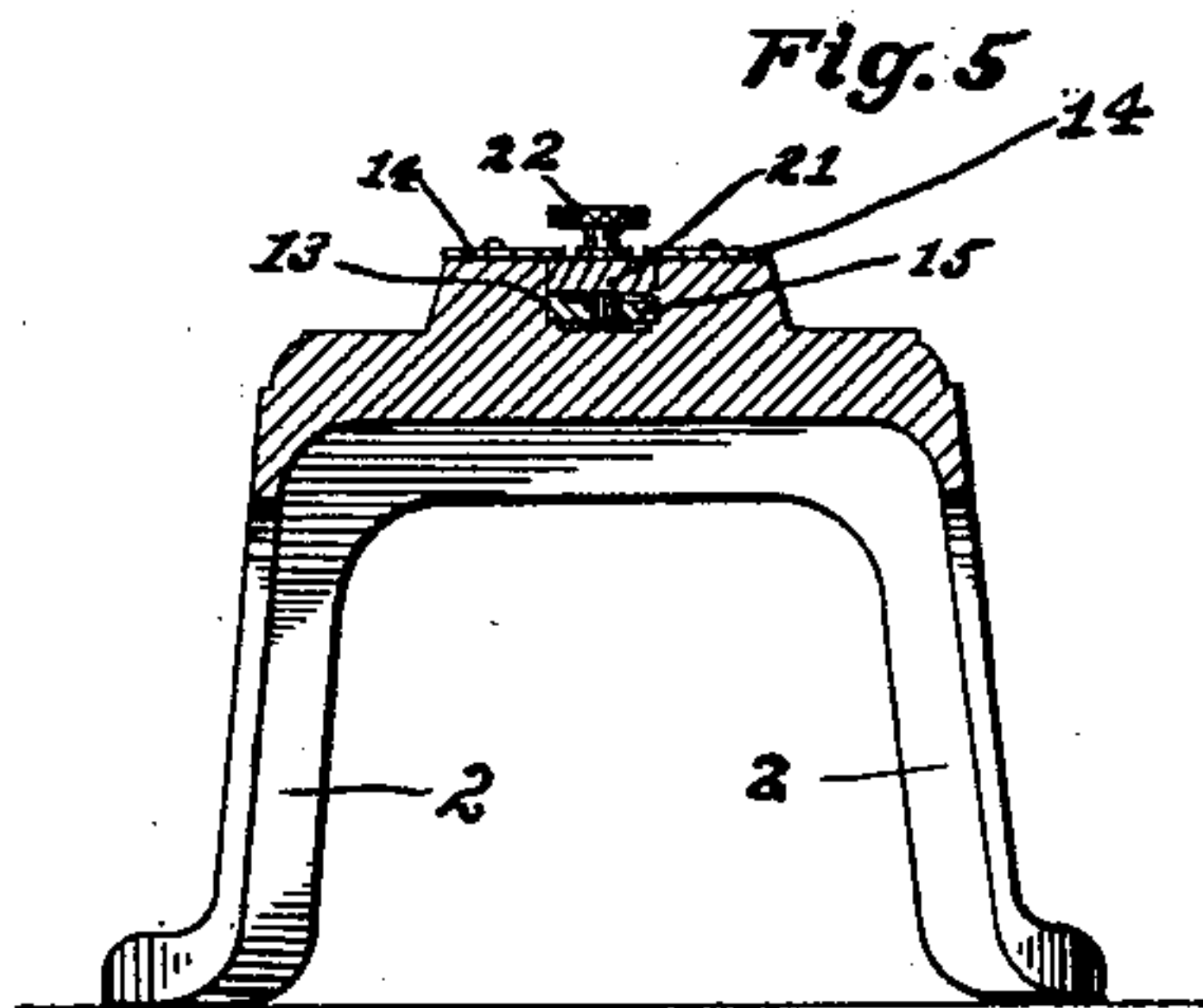
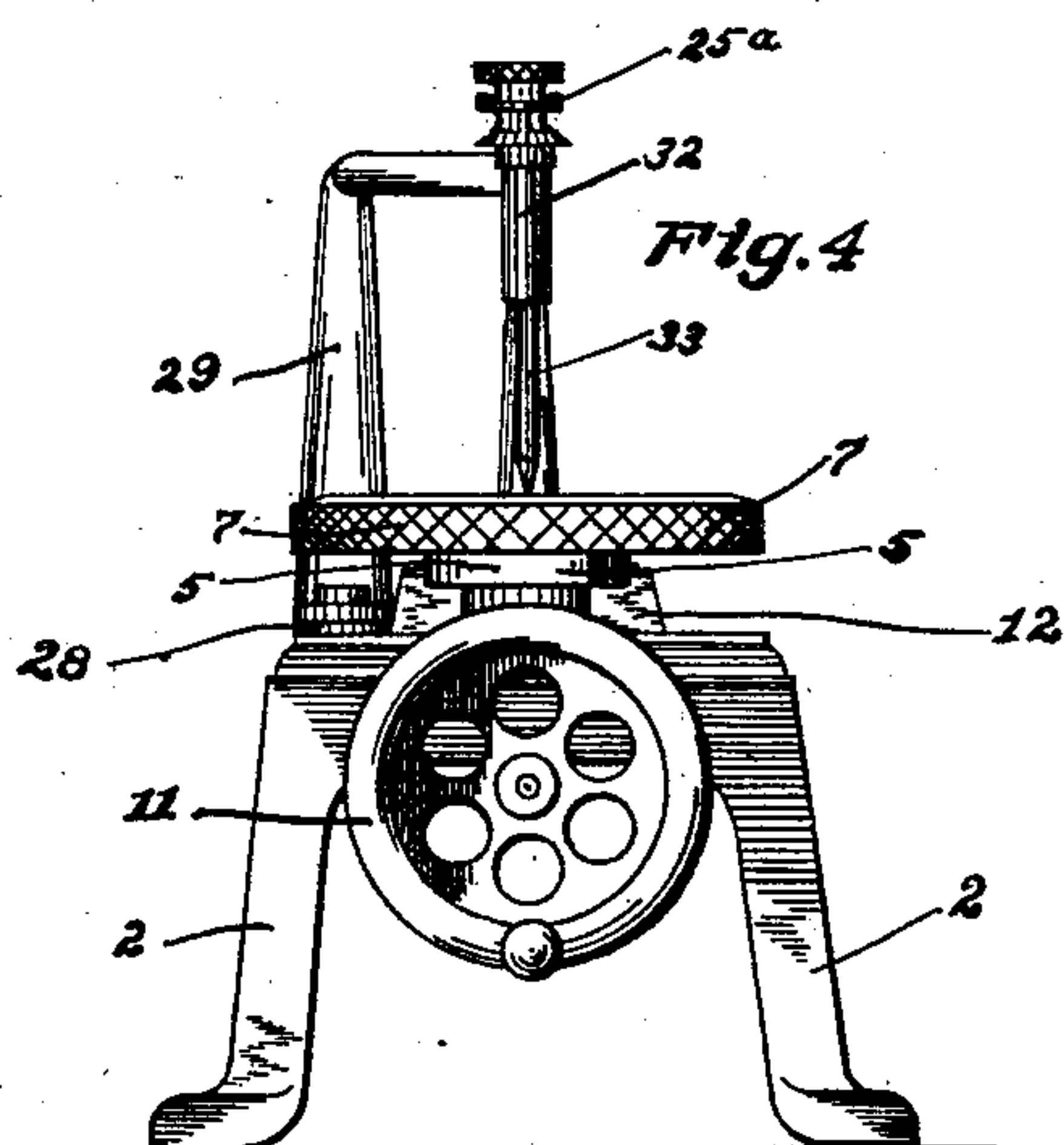
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# UNITED STATES PATENT OFFICE.

GEORGE W. FOWLE, OF COLUMBUS, OHIO, ASSIGNOR TO THE COLUMBUS PHARMACAL COMPANY, OF COLUMBUS, OHIO, A CORPORATION OF NEW JERSEY.

## LENS-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 696,168, dated March 25, 1902.

Application filed November 29, 1901. Serial No. 84,027. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. FOWLE, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented a certain new and useful Improvement in Lens-Cutting Machines, of which the following is a specification.

My invention relates to the improvement of lens-cutting machines, and has particular relation to the improvement of the mechanism forming the subject of Patent No. 673,988 to Lewis O. Linville, issued under date of May 14, 1901.

The objects of my invention are to provide an improved lens-cutting machine of this class of superior construction and arrangement of parts; to so construct the same as to so arrange the same as to secure desirable accuracy in construction and operation; to provide improved means of adjustment whereby lenses may be accurately cut to desired outlines or sizes; to provide improved means for supporting and adjusting the cutting-diamond, and to produce other improvements the details of construction and arrangement of parts of which will be more fully pointed out hereinafter. These objects I accomplish in the manner illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved machine. Fig. 2 is a plan view of the same. Fig. 3 is a central longitudinal section on line *x x* of Fig. 2. Fig. 4 is an end view. Fig. 5 is a transverse section on line *y y* of Fig. 1. Fig. 6 is a detail plan view of one of the pattern-cams shown in conjunction with a portion of one of the cutter-operating bars. Fig. 7 is a central sectional view of a leather disk having a concaved face. Fig. 8 is a similar view of a leather disk having a convexed face. Fig. 9 is a face view of an uncut lens, showing the lines marking a bifocal lens thereon. Fig. 10 is a similar view showing the lines marking the cement-scales of a bifocal lens. Fig. 11 is a view in perspective of an uncut cylinder lens, showing the lens outline thereon; and Fig. 12 is a side elevation of the pattern-cam and its stem.

Similar numerals refer to similar parts throughout the several views.

In carrying out my invention I employ an oblong frame or table 1, having suitable supporting-legs 2. Journaled in an opening in the forward portion of the frame or table 1 is the upwardly-extending hub or hollow stem 3 of a bevel gear-wheel 4. Extending into the hollow of the hub 3 is the downwardly-extending central stem of a pattern-cam 5, the lower end of said stem being squared to properly engage the central squared opening of the gear-wheel 4 and the head of said pattern-cam being in the form of an ellipse or partial ellipse or of a form corresponding with a desired contour of lens. The cam 5 is provided, as indicated in Figs. 3 and 6 of the drawings, with upwardly-projecting fixed pins 6, said pins being adapted to detachably engage corresponding pin-sockets in the under side of a horizontally-arranged circular lens-table 7, said lens-table having its upper face provided with a circular depression into which is adapted to be fitted a disk of leather or similar material 8.

Journaled and keyed to slide horizontally on the under side of the top plate of the table 1 is a shaft 9. This shaft carries thereon a bevel-pinion 10, the teeth of which mesh with those of the gear-wheel 4. On its outer end the shaft 9 carries a suitable hand-wheel 11.

In constructing my improved machine I provide on the upper side thereof toward its rear end a raised longitudinally-arranged bed-plate 12, the latter having a central longitudinal guideway or groove 13, the upper side opening of which is reduced by the employment on opposite sides thereof of parallel plates 14, the inner edges of which project slightly over the sides of said guideway. In the guideway thus formed is a longitudinally movable or reciprocating bar 15, the latter having a longitudinally-slotted opening 16 formed therein. Upon the forward end of this bar 15 is pivotally mounted a small friction-wheel 17, the periphery of which is adapted to bear against the periphery of the cam 5. This friction-wheel 17 is normally retained in contact with said cam through the medium of a spring 18, one end of which is connected with the lower end of a downwardly-projecting pin 19 of the bar 15 and the remaining end of which



is fixed to the under side of the frame-top 1. The pin 19 extends through a slotted opening 20 in said frame-top. On the upper side of the bar 15 and within the guideway 13 is provided a horizontal plate or bar 21, which is slidably supported in said guideway and which is adjustably connected with the bar 16 through the medium of a set or thumb screw 22. From the bar 21 rises the upwardly-extending portion of an angular arm 23, the forwardly-extending portion of said arm normally terminating over the lens-table 7 and being provided with a vertical barrel or cylinder 24, through which passes vertically a plunger-rod 25, the latter being surrounded within the cylinder 24 by a spring 26, the lower end of which is suitably secured in the lower end portion of said cylindrical arm and the upper end of which is made fast to a rod 25. The upper end of the plunger 25 is provided with a suitable head or finger piece 25<sup>a</sup> and the lower end of said plunger is adapted to carry a glass-cutting diamond-point 27. As indicated in Fig. 2 of the drawings, one of the plates 14 has its upper side or face graduated or provided with scale-marks indicating fractions of inches.

Pivotaly connected with the table-top at one side of the center of the width thereof is one end of the horizontal foot 28 of an angular arm 29, which rises from said foot in the manner indicated in the drawings. The unpivoted end portion of the foot 28 is provided with a side notch or recess 30, which is adapted to be made to engage the shank of a projecting pin or screw 31, and thus latch the arm 29 in such position that its forwardly-extending and inwardly-curved portion terminates immediately over the center of the disk 7. This forward termination of the arm 29 is provided with a vertical cylindrical head or barrel 32, within which is provided a spring-actuated plunger or vertical centering-pin 33, the pointed lower end of which is normally held down or in contact with the center of the disk 8.

Pivoted eccentrically to one side of the base of the arm 23 is the rounded head or cam termination of a lever 35, the cam-head being adapted when the lever is pressed downward to produce a frictional lock with the surface of one of the plates 14.

As indicated in the drawings, the periphery of the lens-table 7 is knurled or roughened to facilitate the turning of the same. It will also be seen that upon the upper face of the lens-table and on the margin thereof I have provided the degree marks or graduations, such as are indicated at 7<sup>a</sup>.

In order to illustrate the operation of my improved lens-cutting machine, I will assume that it is desired to cut a lens of a size and character previously prescribed by an oculist. In carrying out this operation the usual preliminary steps are first taken of obtaining the axis of the lens and marking the terminals of the same at opposite points on the uncut lens.

The glass or uncut lens is then placed on the lens-table 7 and held in frictional engagement therewith through pressure of the center pin or plunger 33, the latter bearing on the optical center of the lens. Now following the formula or prescription of the oculist the uncut lens is moved until its axis-marks register with the degree-marks 7<sup>a</sup> of the lens-table called for in the prescription. The set or clamping screw 22 being loosened, the bar 21 and its arm 23 are moved horizontally until a predetermined point on said bar is opposite that graduation-mark of one of the plates 14 which corresponds to the size of lens required by the prescription. The set-screw is now tightened to secure a rigid connection of the bars 15 and 21. The cutting of the lens is now carried out by depressing with a finger of one hand the spring-actuated diamond-carrying plunger 25 until the diamond is in proper contact with the surface of the uncut lens and turning the hand-wheel 11 with the other hand, the result being the rotation of the lens-table 7 and the cutting on the lines of the desired ellipse. It is obvious that in this operation the movement of the diamond-carrying arm 23 will be controlled by the movement of the reciprocating bar 15 and that the backward-and-forward movement of the latter will be controlled by the contour of the pattern-cam with which the friction-wheel 17 is in contact. In case the lens to be produced is what is known as a "cylinder" lens, such as is indicated in Fig. 11 of the drawings, it is obvious that the pressure of the finger upon the spring-actuated plunger 25 may be regulated so as to insure a desirable uniform engagement or contact of the diamond and glass with the convexed surface of the lens throughout the cut. In order to cut a circular lens, the set-screw 22 is loosened and the arm 23 is moved to a point which will bring the diamond opposite a point on the glass the distance between which and the center pin 33 is equal to one-half the diameter of the circle desired. This being accomplished, the lever 35 is pressed downward until, by frictional engagement of its head and one of the plates 14, the arm 23 is locked in the position to which the same has been previously moved. The diamond-holding plunger is now depressed and the lens-table rotated, with the result that a perfect circle of the desired size is scratched upon the glass. In a somewhat-similar manner it is obvious that my improved machine may be employed for cutting what is known as "bifocal" lenses, such as indicated at 35 in Fig. 9 of the drawings, or the cement-scales indicated at 36 in Fig. 10. In producing the bifocal lens 35 the desired size of elliptical lens 37 is first scratched in the manner hereinbefore described, after which the center-pin-carrying arm 29 is thrown outward away from the lens-table and the scratched line of the elliptical lens so placed as to intersect the center of the lens-table. It will be seen that the operation



of cutting the bifocal section from the lens 37 is accomplished by setting the arm 23 as in the process of cutting the circle, inasmuch as the cut necessary to produce the bifocal section is in the arc of a circle.

As shown in Figs. 7 and 8 of the drawings, the leather disk 8 may have its upper bearing-surface concaved or formed convexed to conform to the curvature of the uncut lens-glass and retain the surface of the latter in contact with the surface of said disk.

From the construction and operation herein described it will be seen that while the results obtained are similar to those shown in the heretofore-mentioned patent to Lewis O. Linville the means for movably supporting the friction-wheel-carrying bar and the diamond-carrying arm 33 are such as to obviate the necessity of employing a bearing-frame for these parts, and likewise the necessity of forming in said frame accurately-arranged

bearing-points such as are required in the before-mentioned patent.

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

In a lens-cutting machine, the combination with a frame 1 having a horizontal guideway thereon, a rotary lens-table mounted therein and a pattern-cam carried by said table, of a spring-actuated reciprocating bar 15 mounted in said guideway, a friction-wheel mounted in the forward end thereof, a bar 21 adjustably connected with said bar 15 and an arm 23 rising from the bar 21 and a diamond-carrying spring-actuated plunger supported in said arm, substantially as specified.

GEORGE W. FOWLE.

In presence of—

C. C. SHEPHERD,  
A. L. PHELPS.