

No. 815,233.

PATENTED MAR. 13, 1906.

E. TERRELL.
ENGRAVING MACHINE.
APPLICATION FILED JAN. 21, 1905.

3 SHEETS—SHEET 1.

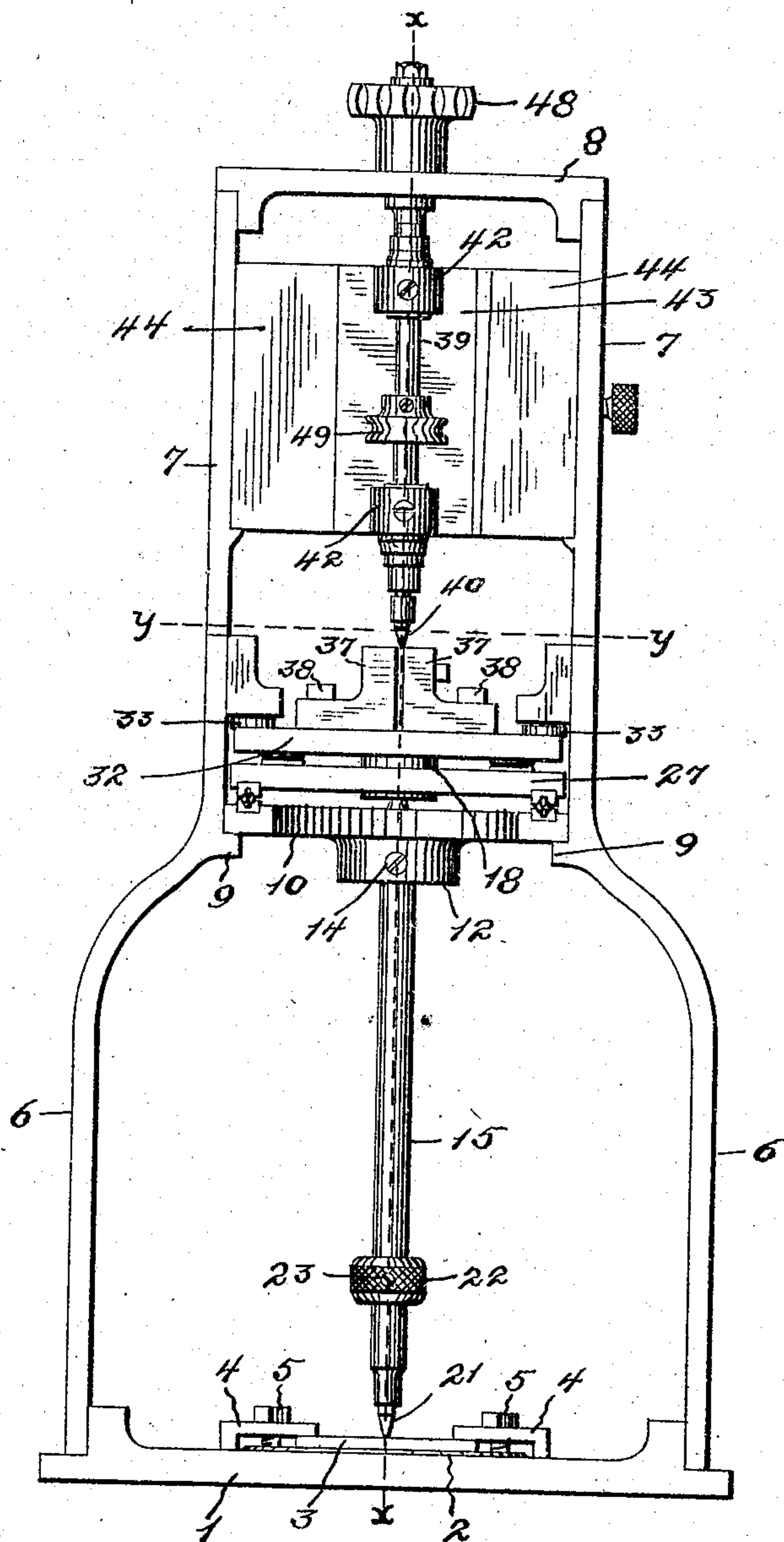


Fig. 1.

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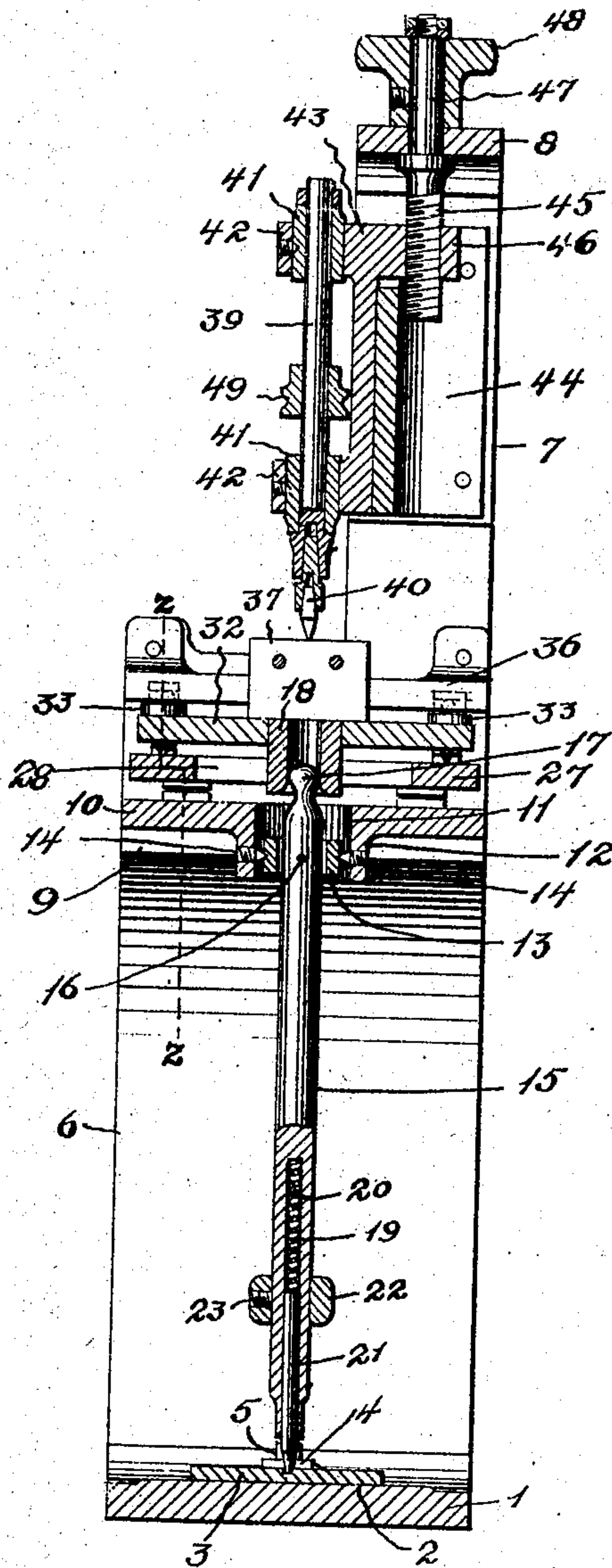


Fig. 3.

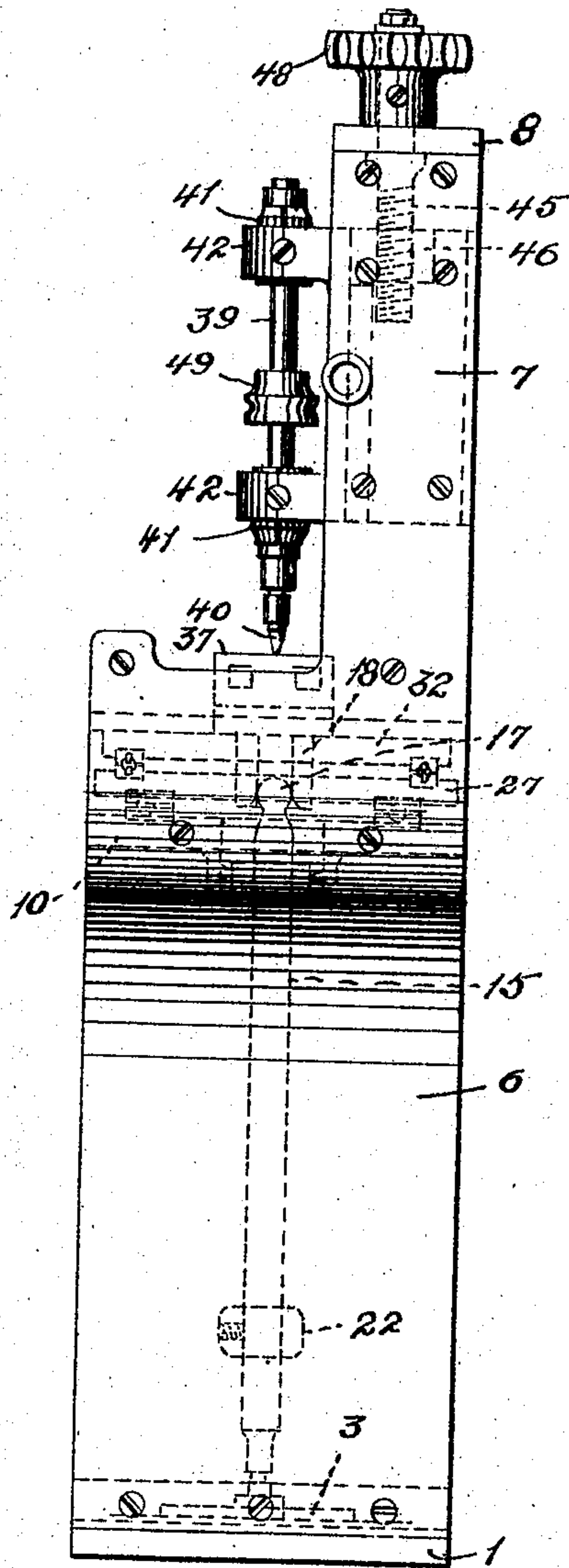


Fig. 2.

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3 SHEETS—SHEET 3.

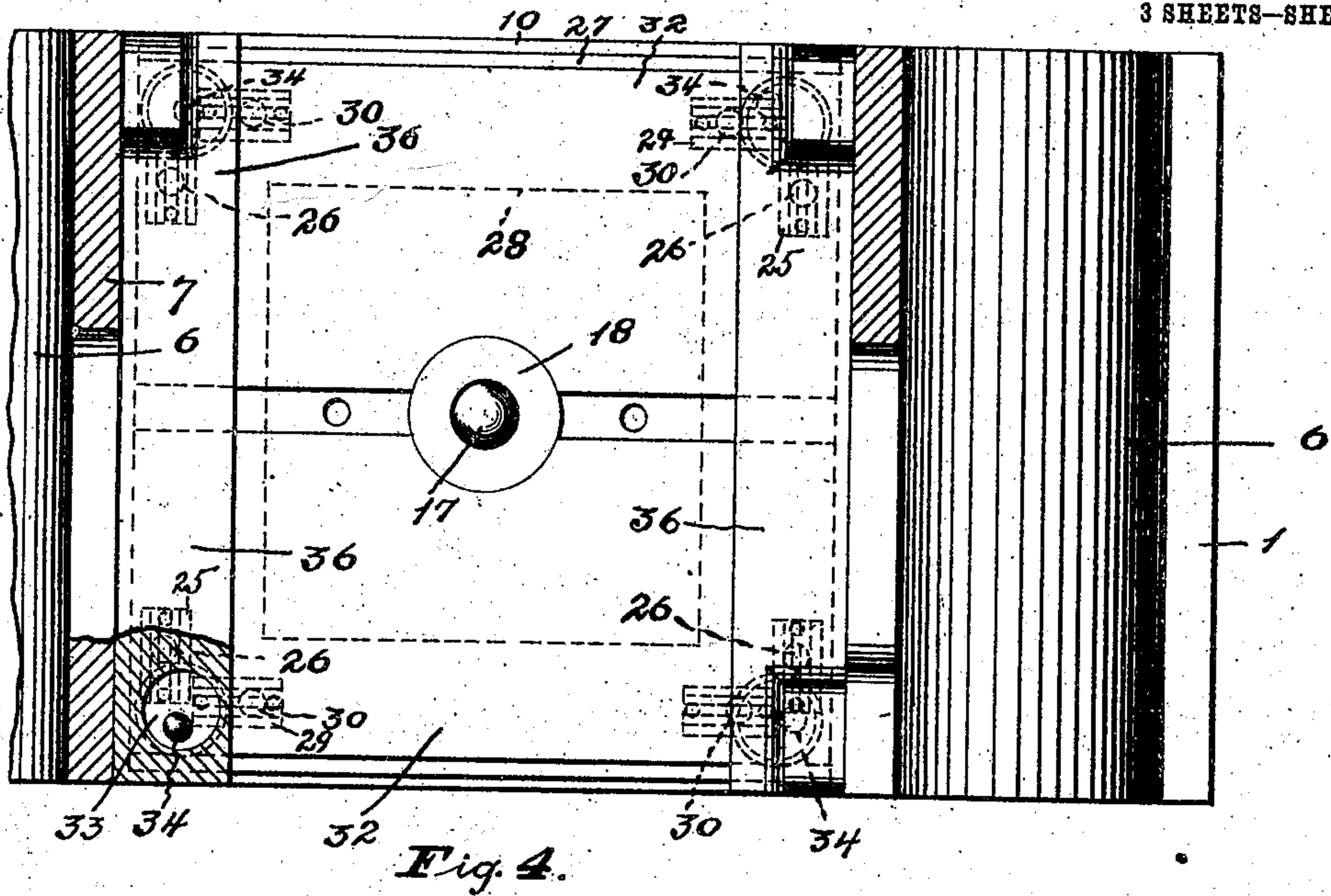


Fig. 4.

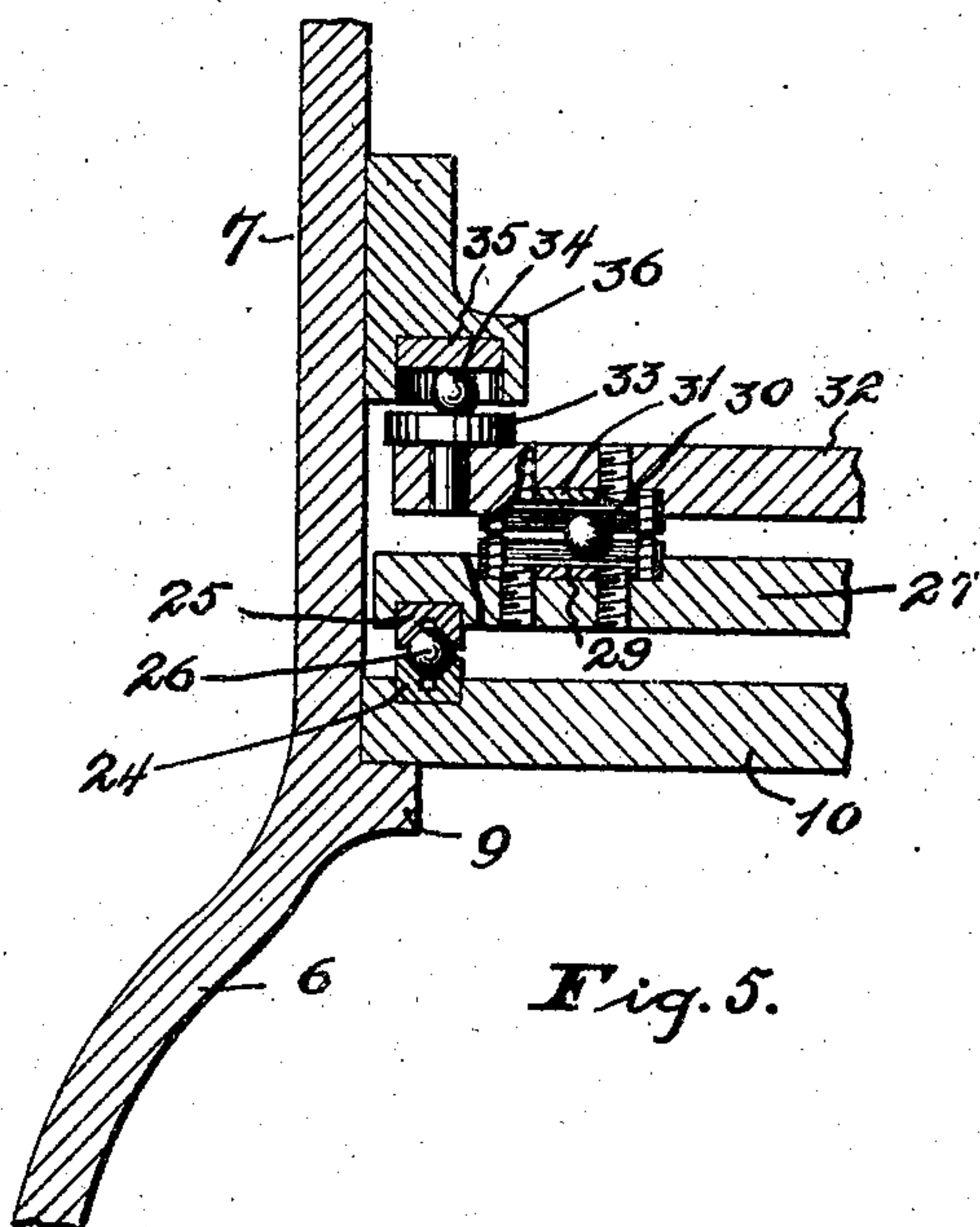


Fig. 5.

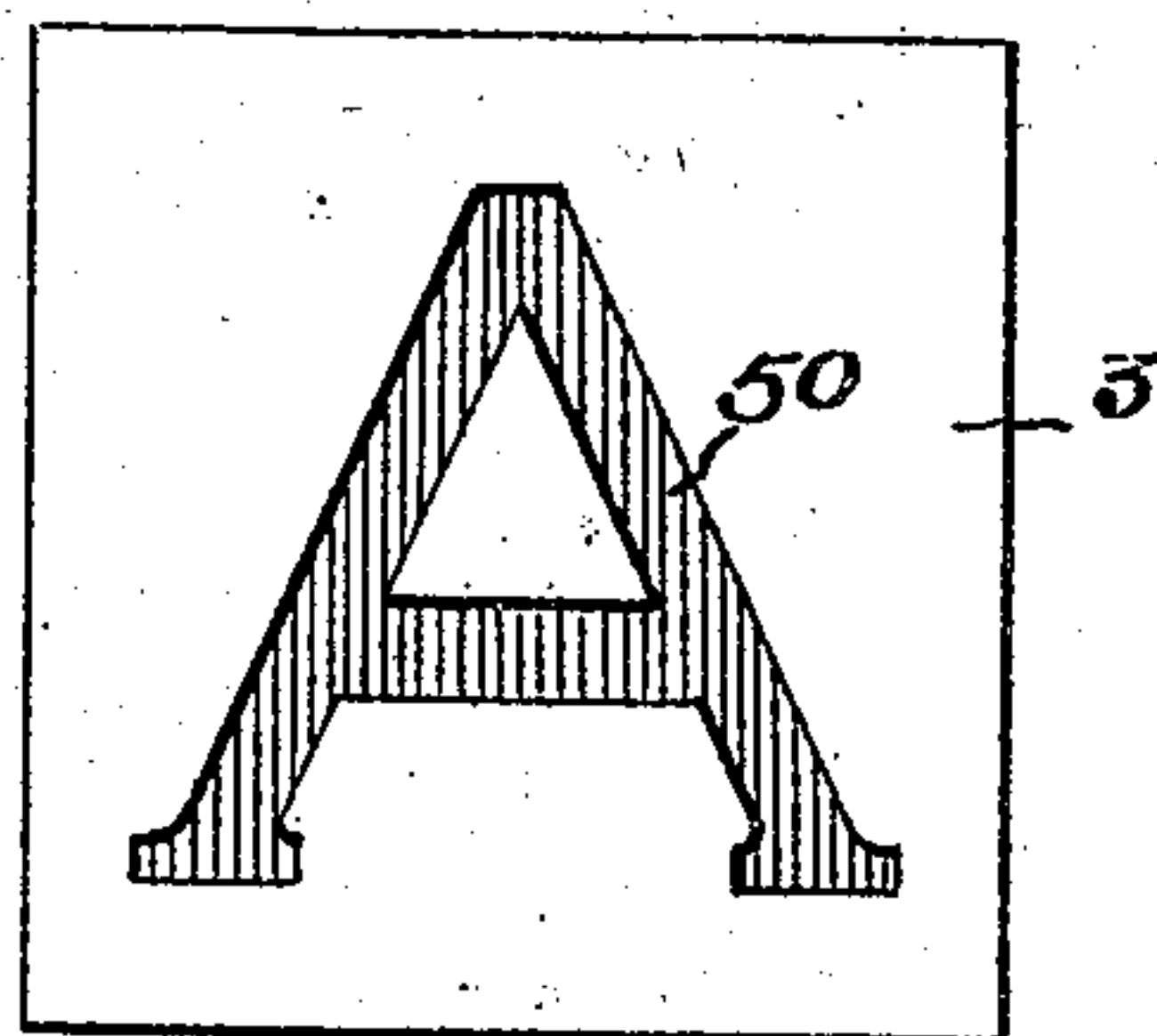


Fig. 6.

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UNITED STATES PATENT OFFICE.

ELAH TERRELL, OF COLUMBUS, OHIO, ASSIGNOR OF ONE-THIRD TO P. A. HOLSTEIN AND ONE-THIRD TO F. A. RAY, OF COLUMBUS, OHIO.

ENGRAVING-MACHINE.

No. 815,233.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed January 21, 1905. Serial No. 242,097.

To all whom it may concern:

Be it known that I, ELAH TERRELL, a citizen of the United States, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Engraving-Machines, of which the following is a specification.

My invention relates to a new and useful improvement in engraving-machines.

The object of the invention is to provide a simple machine of superior construction in which the work is moved beneath a rapidly-revolving tool to effect the cutting operation and also one in which all lost motion is eliminated and in which variations of the minutest degree may be effected.

Another feature resides in the provision of two or more transversely-movable tables for manipulating the work, which are so constructed and arranged as to be sensitive to the slightest movement of the tracing-rod.

Finally, the object of the invention is to provide a device of the character described that will be strong, durable, efficient, and comparatively simple and inexpensive to make and one in which the several parts are not liable to get out of working order.

With the above and other objects in view the invention consists of the novel details of construction and operation, a preferable embodiment of which is described in the specification and illustrated in the accompanying drawings, wherein—

Figure 1 is a front elevation of my improved engraving-machine. Fig. 2 is a side elevation of the machine, showing some of the hidden parts in dotted lines. Fig. 3 is a vertical sectional view taken on the line $x x$ of Fig. 1. Fig. 4 is a horizontal sectional view taken on the line $y y$ of Fig. 1 and showing portions of the machine in plan. Fig. 5 is a partial transverse vertical sectional view taken on the line $z z$ of Fig. 3, and Fig. 6 is a plan view of one of the several pattern-letters employed with the machine.

In the drawings the numeral 1 indicates the base of the machine, which is arranged centrally with the bed or raised portion 2, upon which the pattern-letter 3 is held by means of suitable clamp members 4, secured by suitable set-screws 5, engaging in the bed 2 at each side of the pattern 3.

It is to be understood that any suitable

means for securing the pattern in place may be employed, and the devices shown are merely a preferable form. Extending upward from each side of the base are standards or side frame members 6, which are curved toward each other so as to form at their upper ends vertical uprights 7, which are connected and held together at their upper ends by a cross-bar 8. The uprights 7 are formed at their lower inner ends with laterally-projecting flanges 9, which fixedly support the platform 10. The platform 10 is formed with an opening 11 in its central portion which lies concentric to the opening of a collar or ring 12, which projects from the under side of the said platform, as clearly shown in Figs. 1 and 3. Supported within the collar 12 is a ring 13 of less diameter than the interior of the collar and pivotally mounted on the points of a pair of pivot-screws 14.

It is apparent that the ring 13 is allowed a free swinging movement as the pivot-screws 14 are oppositely disposed, as shown in Fig. 3. Passing through the ring 13 is a tracing-rod 15, which is supported by a pin 16, passing through the rod and secured at each end in the ring 13 at right angles to the pivot-screws 14. It is obvious from this that a universal joint or mounting is provided and that the rod 15 may be swung in any direction. The rod 15 is formed at its upper end, which projects above the platform 10, with a ball-head 17, which projects into the rounded end of a socket-sleeve 18, which will be hereinafter referred to. The tracing-rod 15 is formed at its lower end with a vertically-extending annular recess or bore 19, which extends a short distance upward in the rod, so as to receive a coiled spring 20, disposed to bear upon a stylus or tracing-point 21, which is thus slidably mounted in the bore 19 and projects a short distance below the tracing-rod 15. By such an arrangement the tracing-point is spring-pressed and will thus be firmly held in contact with the pattern as it is moved thereover. Any suitable means for assisting in the manipulation of the tracing-rod may be provided, and I have shown a milled ring 22, which is adjustably held on the rod by means of a set-screw 23, for this purpose.

The most essential feature of my invention resides in the work supporting and moving

means, which I will now describe. The platform 10 is arranged at each side and set in from the front and rear with ball-races 24 and 25, the ball-races 25 being arranged
 5 above the ball-races 24 and a ball-bearing 26 disposed between each pair of races 24 and 25. The upper ball-races 25 support and are secured to the under face of a table 27, which
 10 has a width transversely slightly less than the distance between the uprights 7, so as to allow the table to move freely from front to rear, and vice versa. The table 27 is formed with an enlarged rectangular open center, as shown at 28 in Figs. 3 and 4. Supported
 15 upon the upper surface of the table 27 at right angles to the ball-races 24 and 25 are ball-races 29, each provided with a ball-bearing 30, which supports an upper ball-race 31 directly over each ball-race 29. The ball-
 20 races 31 support and are secured to the under side of a work-carrying table 32, which has a width transversely considerably less than the distance between the uprights 7, so that the said table may freely move from side to side
 25 or laterally between the uprights and at right angles to the table 27. The table 32 is provided at each corner, as best shown in Figs. 4 and 5, with a hardened bearing-disk 33, fastened on the table and impinged by a ball-
 30 bearing 34, which in turn impinges a hardened-metal disk 35, supported in a recessed bracket 36, secured to the uprights 7, one of said brackets being secured to the uprights 7 at each side of the plate 32 over and between the
 35 disks 35. The brackets 36 and their disks 35 and ball-bearings 34, bearing on the disks 33, act to hold the tables and their parts in position and against vertical displacement, but at the same time reducing the friction to a mini-
 40 mum. It is obvious that the tables 27 and 32 being entirely supported by ball-bearings will be sensitive to the slightest touch and that they may be moved readily and expeditiously without vibration or jar.

45 The socket-sleeve 18, hereinbefore mentioned, projects beneath and is secured in the table 32, central thereof, and passes through the opening 28 of the table 27, which is considerably larger than the sleeve, so as to al-
 50 low the sleeve a free movement without contacting with the said table. Directly over the sleeve 18 and upon the upper side of the table 32 are arranged work-holding members 37, adapted to be locked in position by suit-
 55 able set-screws 38, it being understood, however, that various forms of work-holding members may be employed, according to the desires of the operator. The tracing-rod 15 being supported near its upper end and con-
 60 nected with the tables 27 and 32, it is apparent that when the said rod is swung the travel of its point 21 will be communicated to the work-holding members and the work, but on a reduced scale. It will be apparent, how-
 65 ever, that the work is moved in a horizontal

plane, and owing to its sensitive support the slightest movement of the stylus or point 21 will be communicated to the said work.

For operating on the work I provide a ver-
 tical shaft 39, which carries at its lower end a
 70 suitable cutting-tool 40, properly mounted in the lower end of the shaft 38, which shaft is supported in suitable bushings 41, carried by bearing-boxes 42, which project forwardly
 75 from a vertically-adjustable head 43. The head 43 is slidably mounted in a suitable cross-frame or block 44, supported by the uprights 7 and rigidly held thereby. For
 adjusting the head 43 so as to raise and lower the shaft and its tool 40 over the work I pro-
 80 vide a screw 45, which is threaded through the rearwardly-projecting portion 46 of the head and which screw is provided with a
 shank 47, projecting upwardly through and above the cross-bar 8 and having fixed on its
 85 projecting end a hand-wheel 48, by which the screw may be turned to cause the lug 46 to travel vertically on the said screw, and thus
 adjust the head 43. A suitable pulley 49 is fixed upon the vertical shaft 39, so that mo-
 90 tion may be transmitted to the shaft and the latter driven at a high rate of speed when it is desired to cut the work by the tool 40.

In Fig. 6 I have shown one of the pattern-
 letters 3, which is provided on its surface with
 95 the grooved letter 50, in which the stylus or point 21 is traversed to move the table, so that the work supported by the members 37 will be moved under the cutting-tool 40 to
 correspond to the design traversed by the
 100 said stylus on the pattern or pattern-letter 3.

From the foregoing it is thought that the invention and its operation will be clearly understood; but it may be briefly stated that
 105 the suitable pattern or pattern-letter 3 being placed upon the bed 2 and clamped in position by the clamps 4 the stylus is then placed in the center of the pattern, which is ready for operation. The proper tool 40 having been
 110 placed in the end of the shaft 39, the same having previously been elevated by vertically adjusting the head 43, the work is placed between the members 37 and the shaft and its tool 40 lowered upon the work by the
 115 head 43 and the screw 45. Motion being imparted to the shaft 39 by way of the pulley 49, the tool 40 is revolved at a high rate of speed and the operator traversing the stylus in the groove of the pattern the design is
 120 rapidly and readily cut on the work, and the operator is allowed to give all his attention to the pattern and the tracing of the same.

One of the advantages of my construction is the steadiness of the tracing-rod and the
 125 tables. The latter while sensitive to the slightest movement of the tracing-rod are held rigidly by the said rod, so as to have no independent movement thereof, and the rod itself is firmly supported in its universal
 130 mounting. By such a construction and ar-

rangement a perfect and clear cut is had and wavering lines eliminated.

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

1. In an engraving-machine, the combination with a non-traveling cutting-tool and a fixed platform arranged directly beneath the tool, of a work-carrying table supported on the said platform so as to move in a plane parallel thereto, means projecting over the work-table for holding the same in position and preventing vertical displacement thereof, and a tracing-rod universally supported in the platform and having universal connection with the bottom of the work-table.

2. In an engraving-machine, the combination with a non-traveling cutting-tool and a fixed platform arranged directly beneath the tool and having guides on its upper surface, of an open table movable in said guides and having guides on its upper surface transverse to the first-named guides, a work-carrying table supported on the open table and movable in said last-named guides so as to have a universal movement in a plane parallel to the platform, a tracing-rod universally supported in the platform projecting through the open table and having universal connection with the bottom of the work-carrying table, and a pattern-support arranged beneath the fixed platform and adjacent to the lower end of the tracing-rod.

3. In an engraving-machine, the combination with a non-traveling cutting-tool and a

fixed platform arranged directly beneath the tool, of an open table supported on the platform and mounted for reciprocating movement thereon in one direction, a work-carrying table supported on the open table and mounted for reciprocating movement thereon in a direction transverse to that of the open table, whereby the work-carrying table has a universal movement with reference to the fixed platform in a plane parallel therewith, a tracing-rod universally supported in the platform, projecting through the open table and having universal connection with the bottom of the work-carrying table, and a pattern-support arranged directly beneath the fixed platform and adjacent to the lower end of the tracing-rod.

4. In an engraving-machine, the combination with supporting means and a non-traveling cutting-tool arranged on the supporting means, of a platform fixed to the supporting means, horizontally-movable work-supporting devices movably mounted on the platform beneath the tool, and means mounted on the supporting means above the movable work-supporting devices for holding the same in position and preventing vertical displacement.

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

ELAH TERRELL.

Witnesses:

A. L. PHELPS,
M. B. SCHLEY.