

No. 612,892.

Patented Oct. 25, 1898.

A. J. BRADLEY.
STENCIL MACHINE.

(Application filed Dec. 24, 1894.)

(No Model.)

3 Sheets—Sheet 1.

Fig. I.

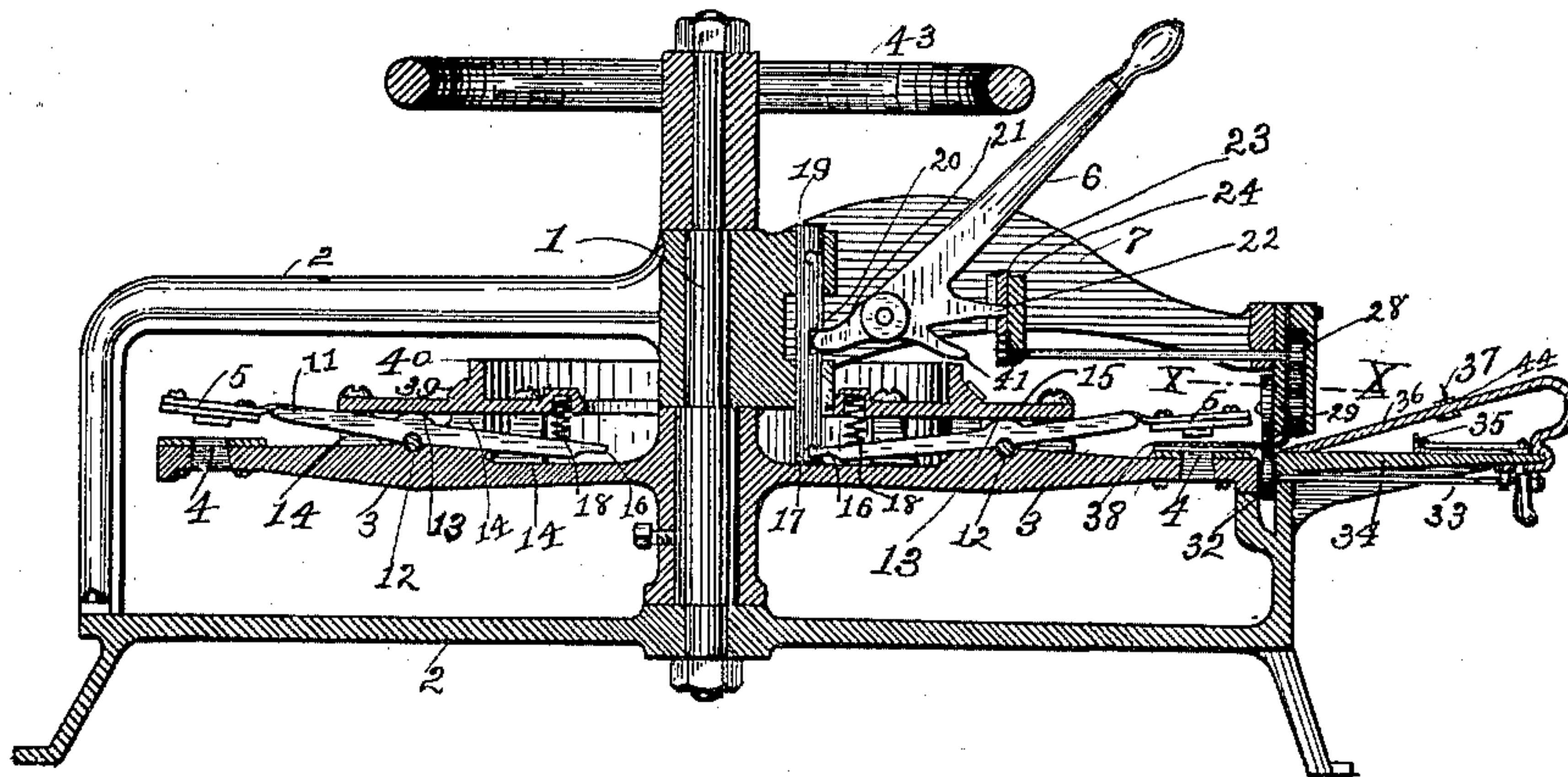
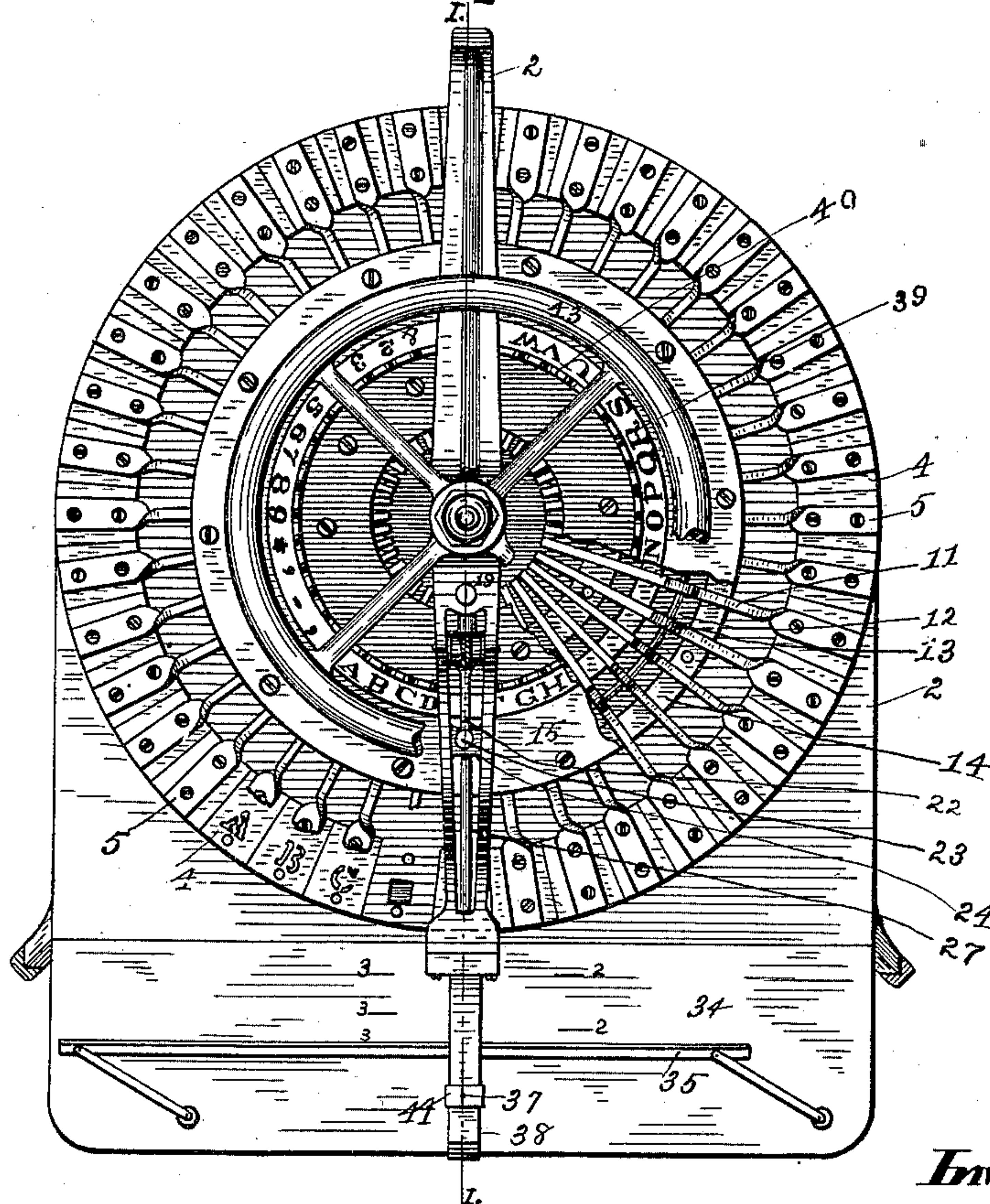


Fig. II.



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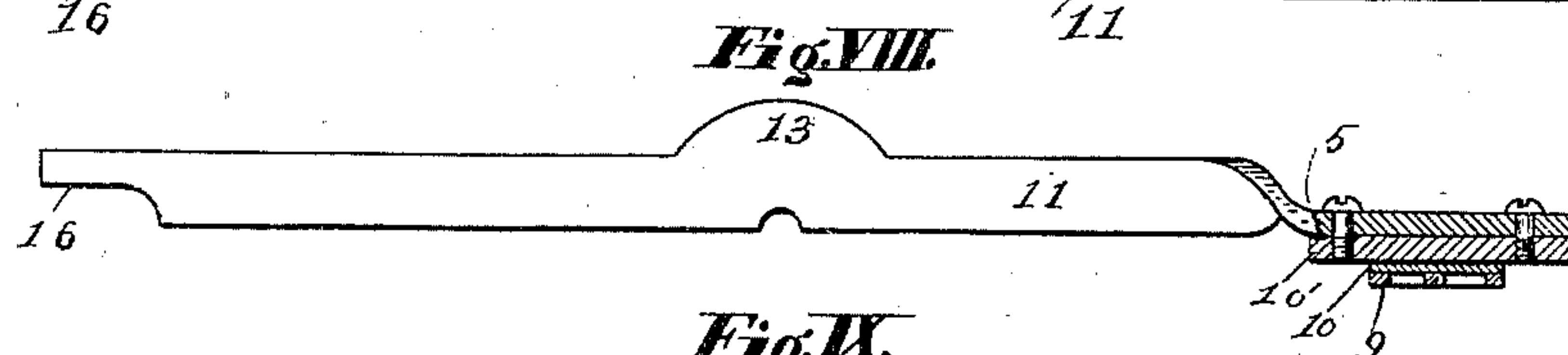
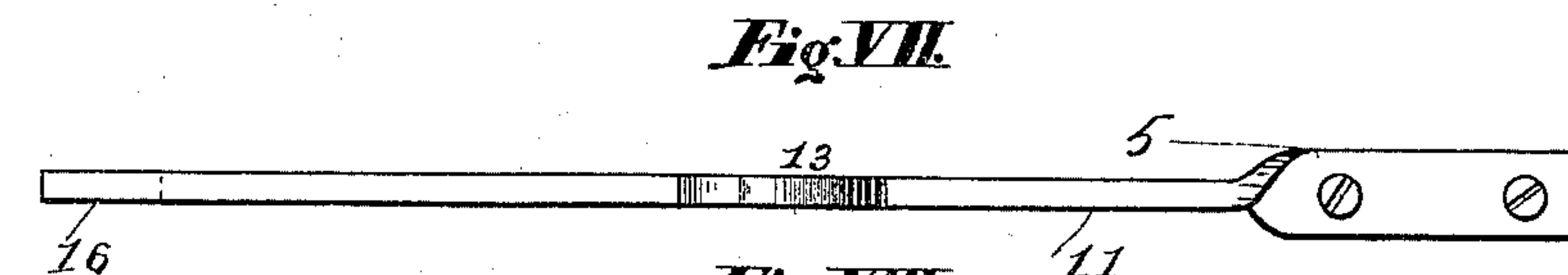
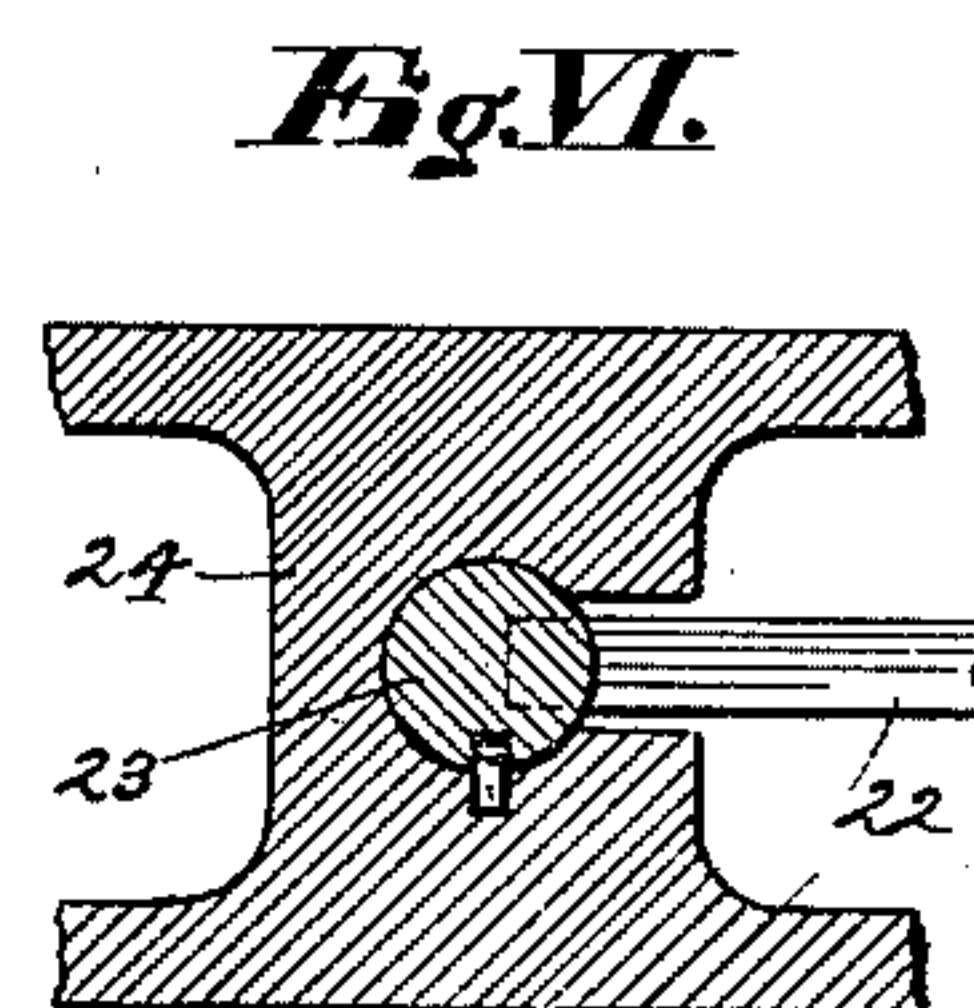
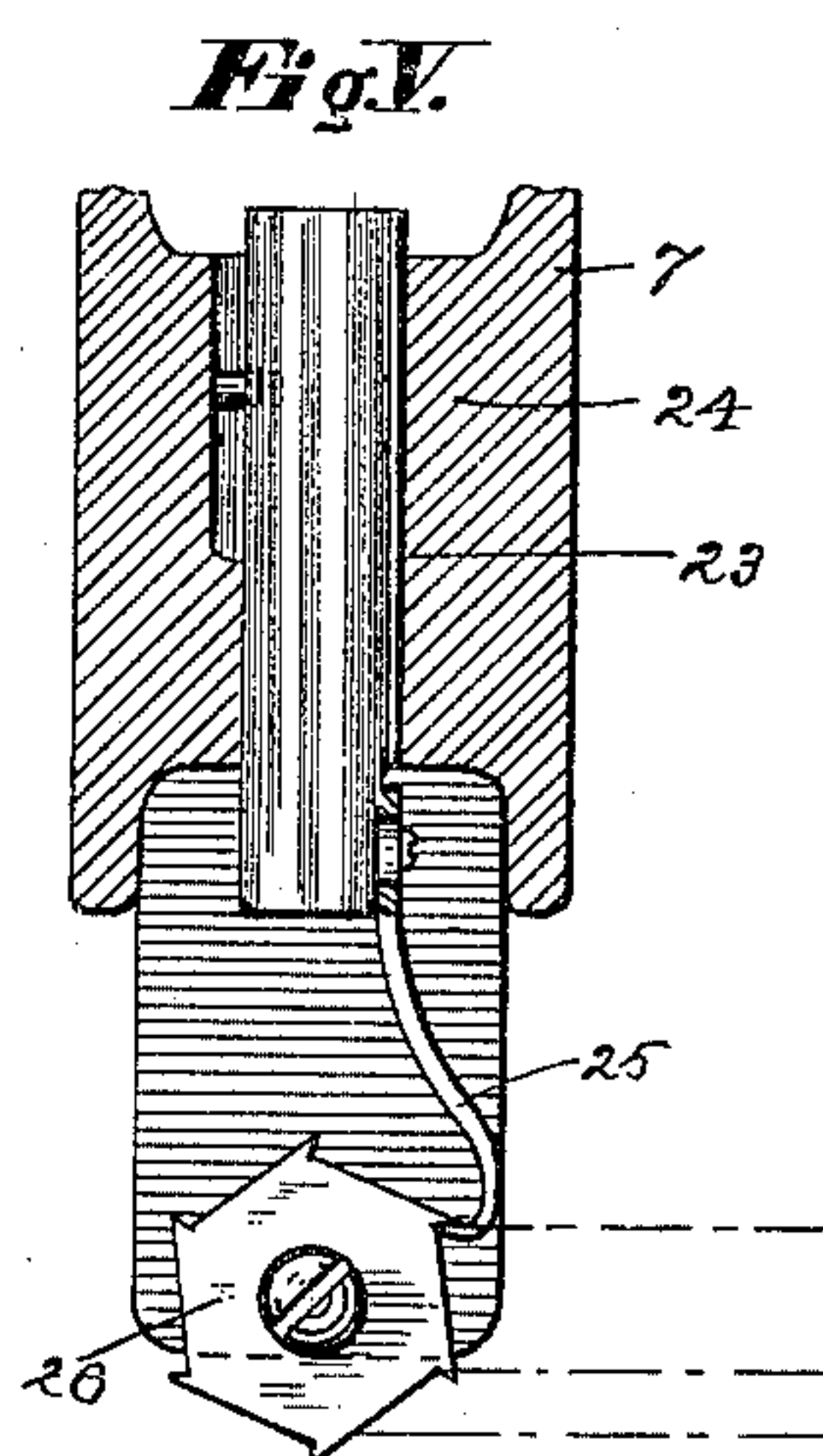
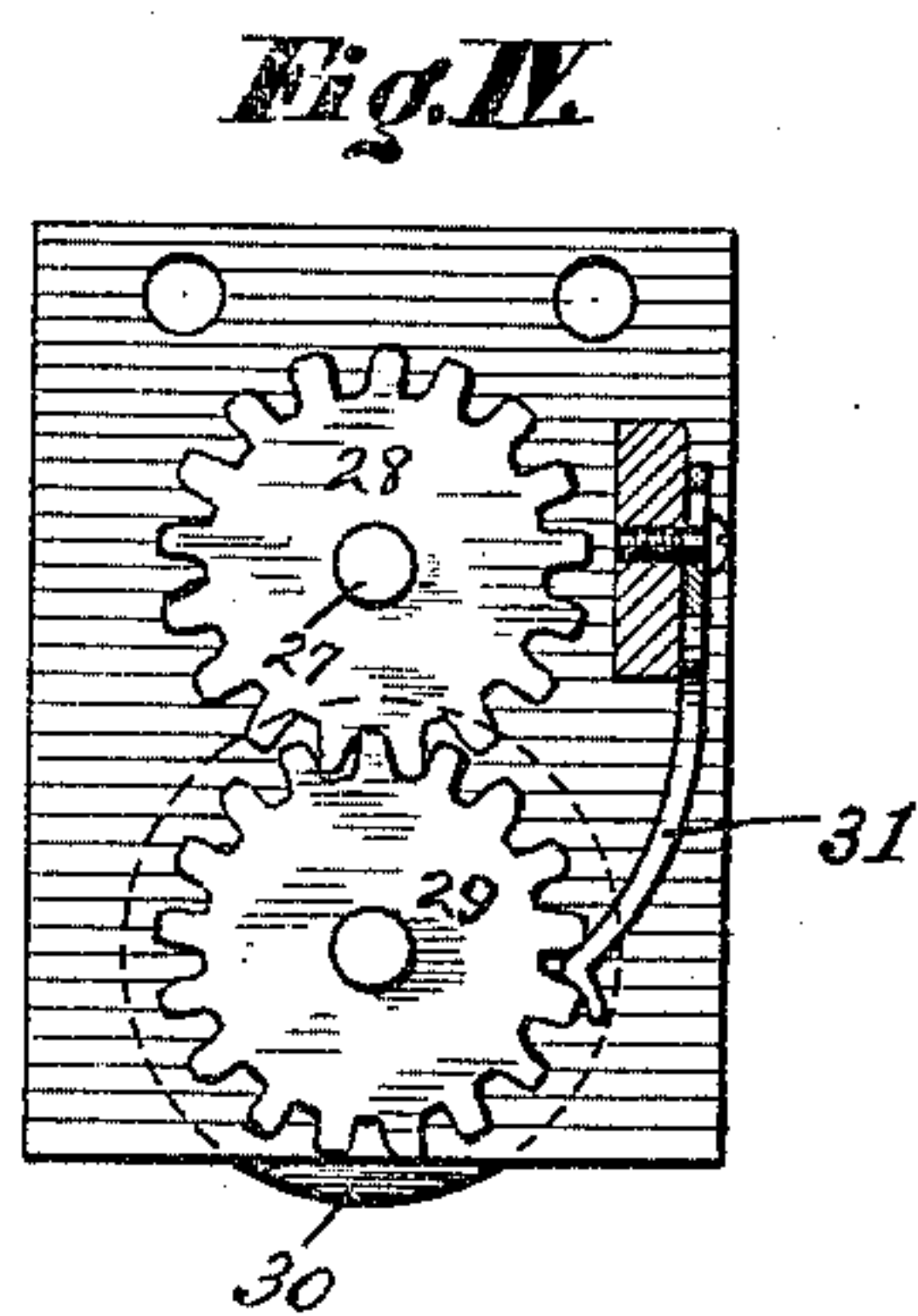
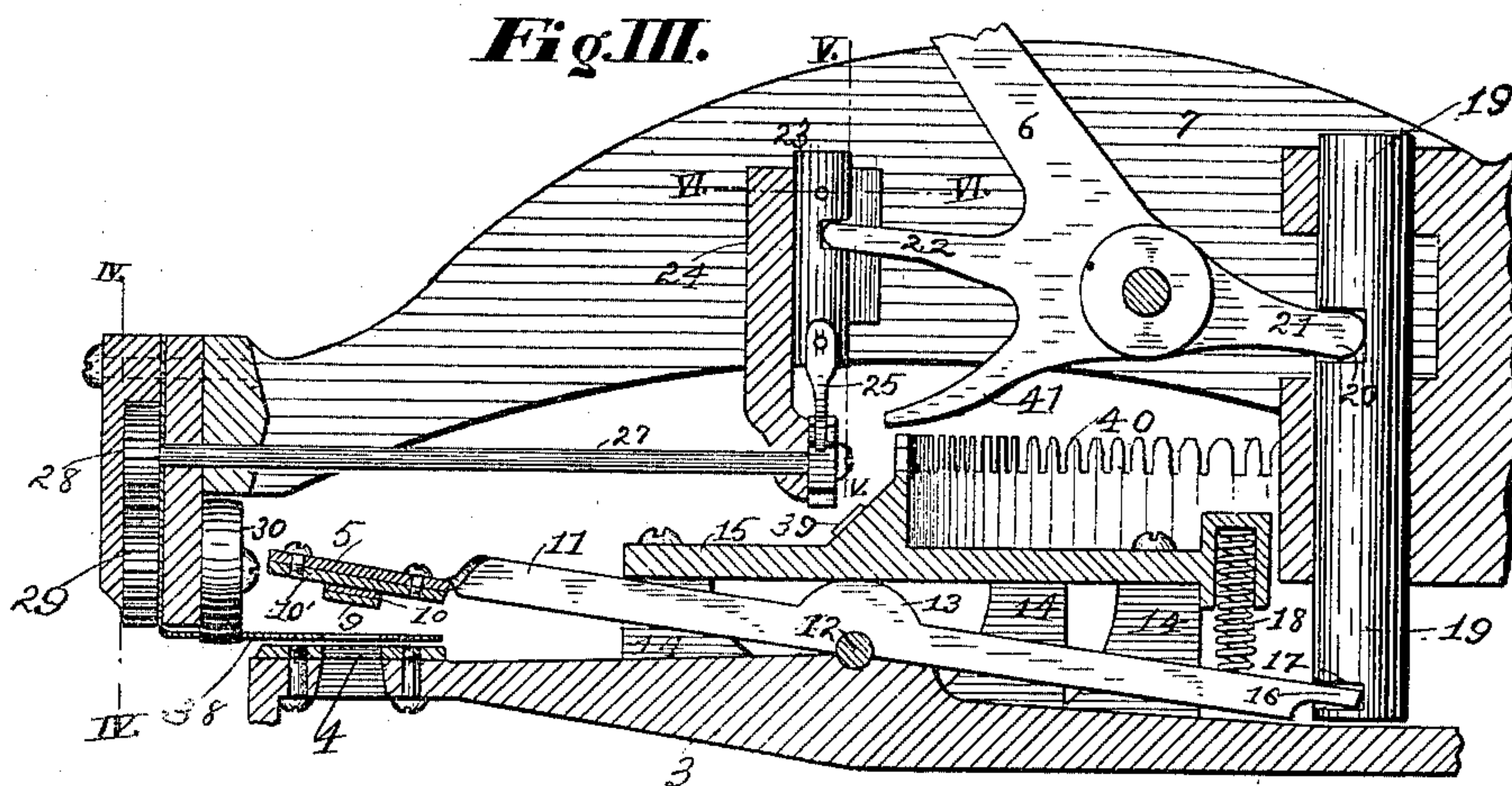
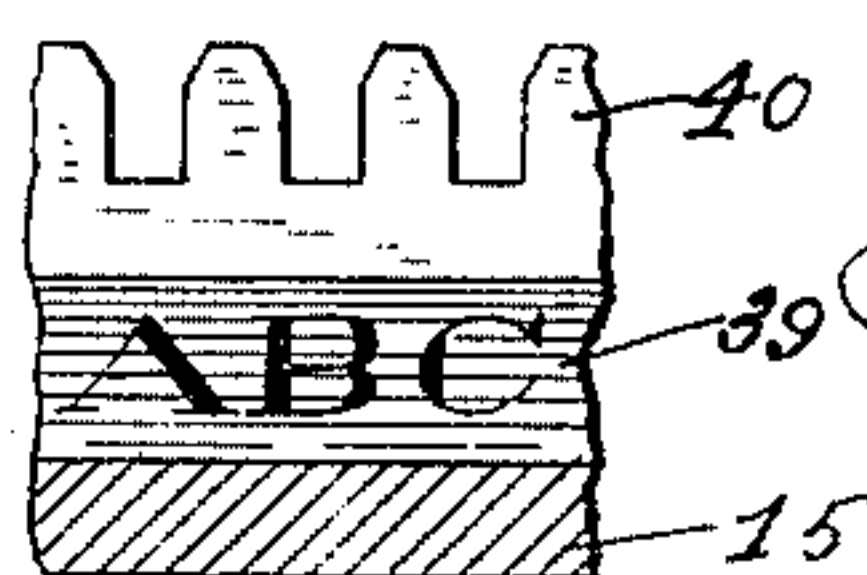


Fig. IX.



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Fig. X.

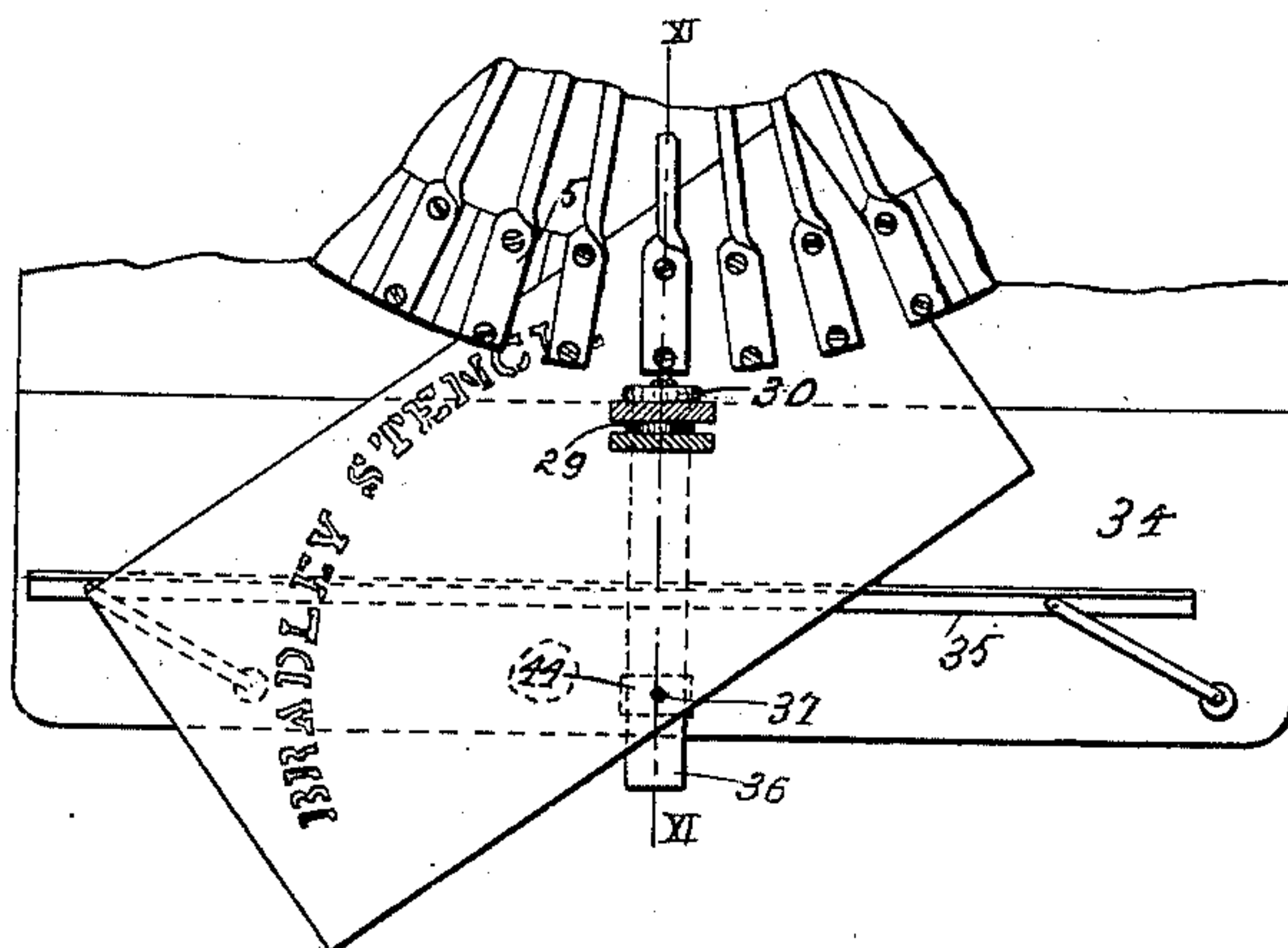


Fig. XI.

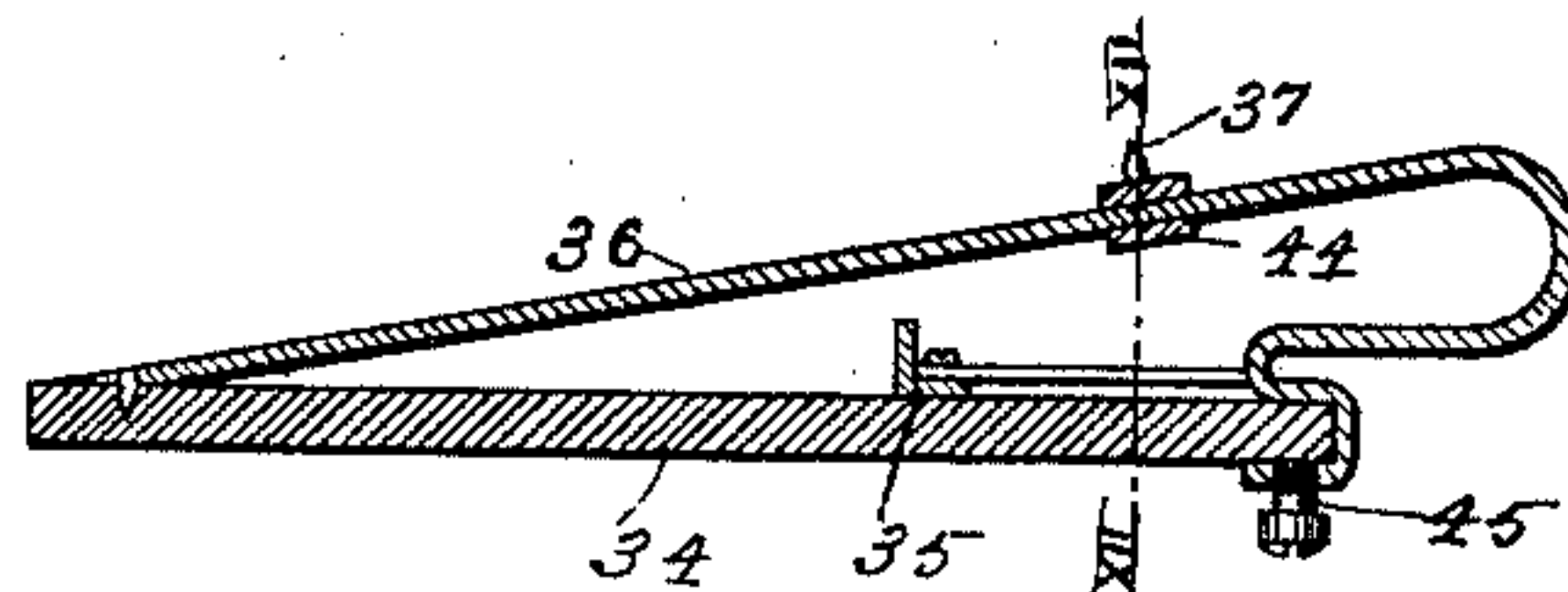
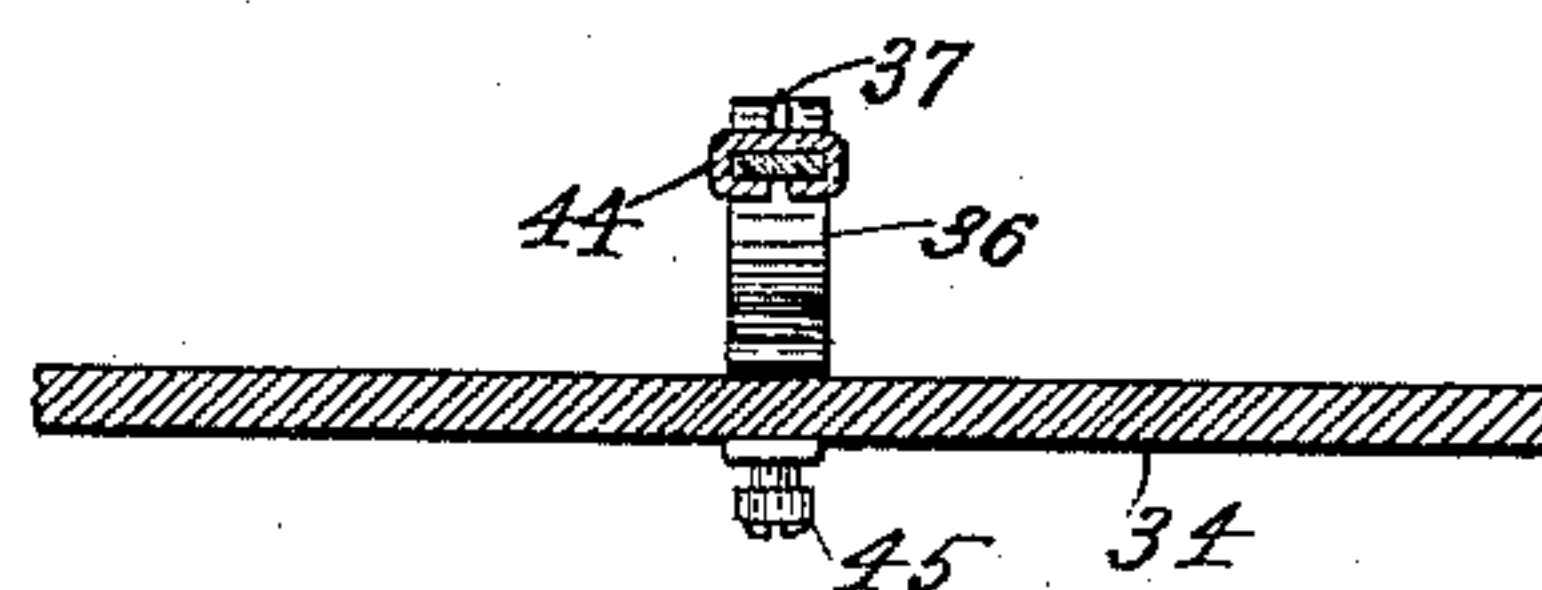


Fig. XII.



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UNITED STATES PATENT OFFICE.

ANDREW J. BRADLEY, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE BRADLEY
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STENCIL-MACHINE.

SPECIFICATION forming part of Letters Patent No. 612,892, dated October 25, 1898.

Application filed December 24, 1894. Serial No. 532,771. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. BRADLEY, residing in the city of St. Louis, State of Missouri, have invented a new and useful Improvement in Stencil-Machines, of which the following is a specification.

My invention relates to machines for cutting stencils and analogous purposes; and it consists in the parts and in the arrangements and in the combinations hereinafter set forth.

In the accompanying drawings, which form part of this specification, Figure I is a vertical sectional view of my device. Fig. II is a top plan view thereof with portions broken away to show the arrangements of parts below. Fig. III is an enlarged sectional view, being the reverse of Fig. I, of a portion of the machine. Fig. IV is a vertical sectional detail of the feed-operating wheels on the line *iv iv* of Fig. III. Fig. V is a vertical sectional detail of the feed-operating device on the line *v v* of Fig. III, and Fig. VI is a horizontal section of the same device on the line *vi vi* of Fig. III. Fig. VII is a top view, and Fig. VIII is a side view, partially sectional, of a punch. Fig. IX is a detail of the indicator and centering guide. Fig. X is a fragmental plan view illustrating the operation of the circular feed, the view being taken on the section *xx* of Fig. I; and Figs. XI and XII are vertical sectional views illustrating the circular feed device on the line *xi xi* of Fig. X and on the line *xii xii* of Fig. XI, respectively.

A main shaft 1 is supported in any suitable frame 2—as, for instance, by a yoke-piece fixed to the base of the frame. This shaft 1 carries a circular body 3, constituting the die-carrier. Female dies 4 are arranged in a circular row in the carrier 3, near the outer edge. The several punches 5, corresponding to the respective female dies 4, are also permanently secured to the die-carrier 3 in operative relation to their respective female dies. The several punches are operated by a plunger or lever 6, adapted to operate by its movement any one of the punches which happens to be in proper position at that time. The punches are normally held away from their dies by springs. In order that the several punches may be operated by the one plunger, either the plunger should move in a circular path

along the row of punches, as it may do if journaled to the main shaft 1, or the die-carrier should be free to rotate on said supporting-shaft 1. It is preferable to have the die-carrier rotate on the shaft, in which case the plunger may be permanently located at any desired point.

The best specific embodiment of my improvement is the following:

Instead of the female punches being formed in the body of the carrier 3, holes or perforations are cast or otherwise made in said carrier where the female dies are to be, said holes being large enough to permit an easy passage therethrough of the punched-out or waste material. Over these holes face-plates containing the proper designs therein, with cutting edges, are mounted on the carrier 3.

The punches 5 consist, preferably, of three or four parts, a sharp-edged face piece or pieces 9, constituting the design, a back plate 10, on which such face-piece is mounted, and a shank 11, to which the back plate 10 is rigidly secured. When a fourth piece is used, the arrangement is as follows: The face-piece is soldered or brazed to a back plate 10, small enough to pass through the hole in the stripper-plate 38, hereinafter mentioned. This back plate 10 is soldered to a larger mounting-plate 10', which is fastened to the shank 11. In the present construction this shank 11 consists of a flat bar whose end portion is twisted at right angles to the main body, and to this end portion the back plate 10 is screwed or otherwise fastened flatwise. In the lower edge—that is, the edge corresponding with the side on which the punch-plate is mounted—a semicircular or curved notch is formed near the middle of the bar, and on the upper edge of said bar, just above the notch, is a curved projection 13, whose edge is the arc of a circle described from the same center as the notch. The several punch-bars are arranged radially and with their curved notches fitting over a curved surface 12, provided therefor on the die-carrier to serve as an axle or pivot. This axle 12 may be a single ring of heavy cylindrical wire fastened concentrically on the die-carrier.

In order to prevent lateral movement, the punch-bars are fitted in radial slots, which

are preferably cut or milled in the body of the die-carrier, leaving the walls of the slots integral with the die-carrier. An annular slot, extending nearly or quite to the bottom of these radial slots, may accommodate the ring of wire which serves as the axle for the punch-bars. This axle should be so located that when the punch and die-faces meet their faces may be flush. The sides of the slots thus form lugs 14, on which a clamping-plate 15 rests and is fastened. This circular clamping-plate 15 is firmly fastened to said lugs 14, so as to bear against the circular projections 13 on the punch-bars and serve as a bearing-surface therefor when they turn vertically on their pivots. The inner end 16 of the punch-bar terminates in a hook or tail adapted to pass laterally through a slot 17 in a plunger 19, and this inner end is normally depressed by a spring 18. This spring 18 may be an ordinary helical spring, bearing at one end against said punch-bar and at the other against the clamping-plate 15. Any suitable limiting-stop may be provided for said punch-bar. In the form shown the edge of the circular clamping-plate 15 serves as a limiting-stop, said edge being high enough to allow sufficient space between the punch in its normal retracted position and the corresponding die.

The plunger 19 reciprocates vertically in slots or guides provided therefor in the yoke 7 or other part of the frame in line with the inner ends 16 of the punch-bars. The slot 17 is located in the outer side of the plunger and is cut deep enough and in proper position to have the ends of the punch-bars pass through it without interference when said plunger and punch-bars are in their normal positions. Therefore if the plunger is raised while the end of one of such punch-bars is in said slot 17 the outer end of the punch is depressed to cooperate with the corresponding die. Such a movement of the plunger is effected by the hand-lever 6, a working slot 20 in said plunger providing suitable bearing-surfaces for an arm 21 on said lever 6. Obviously in place of the ends of the punch-bars working in the slot 17 hooks may be provided on the ends of said bars for this purpose.

The feeding mechanism is as follows: The hand-lever 6 has a projecting arm 22, adapted to work in a slot in a bar 23, which reciprocates vertically in guides 24, provided therefor on or in the yoke-piece 7 or other portion of the frame. (See Figs. II, V, and VI.) A spring-pawl 25 depends from the lower end of this bar 23 and is adapted to advance in its forward movement beyond the point of operative contact with a ratchet-wheel 26 and to operate said ratchet-wheel at a predetermined point in its backward movement. This ratchet-wheel is fixed on a shaft 27, which shaft carries a gear-wheel 28 near its outer end. A second gear-wheel 29 meshes with said gear-wheel 28, and a friction or feed wheel 30 is fixed on the shaft which carries the gear 29. A spring-pawl or steadying-

spring 31 bears against the cog-wheel 29 to steady the same and bring it to rest in the exact position desired. The feed-wheel 30 extends down through a hole made in the stripper-plate 38 therefor and bears upon an idle-wheel 32, journaled on a movable shaft 33, supported in the frame, or a shelf 34, attached thereto, whereby the idle-wheel 32 can be moved to and from the feed-wheel 30. The feed table or shelf 34 is about flush with the tops of the female dies and just below the stripper-plate 38, and said shelf carries a straight ruler 35, pivoted thereto by stiff-acting parallel links, whereby the various positions of the ruler are parallel. This contrivance therefore is a guide to secure parallel alinement on the stencil or brand.

Figs. X, XI, and XII illustrate a simple attachment for securing a circular parallel alinement without removing the parallel-ruler. A small frame 36, shown as a stiff strip of sheet-steel bent or doubled into proper shape, is secured to the feed table or shelf 34. On this frame 36 is a pin 37, arranged in line with the main shaft and the operating-punch. In order not to interfere with the parallel-ruler 35, the frame bridges over it and is removable or detachable from the shelf 34. When the steel strip is used, one end is doubled back on itself to grip the edge of the shelf, and then it is turned up to clear the parallel-ruler, and then inclines forwardly and downwardly, meeting the shelf, to which it is secured by a pin or screw. A set-screw 45 may secure the other end to the table or shelf. The pin 37 is carried on a spring or friction clip 44, which passes around the frame and slides to and fro thereon, resting by friction wherever it is set. The operation of the device is this: The stencil to be cut is pierced by the pin 37, which thereby becomes a pivot on which the stencil turns. The forward portion of the stencil-blank is moved by the feed-wheels, while the portion which the pin pierces is fixed. Therefore the alinement of the brand cut in the stencil is circular. If a second line is to be cut parallel with the first, the stencil-blank and the clip are advanced the desired distance and with the pin piercing the blank in the same place as before in order that the two circular lines of the stencil may be cut with the same center. In other words, the moving of the clip merely changes the length of the radius of curvature without changing the center so long as the pin pierces the stencil at the same place.

The feed device moves the blank one space; but in order to insure the proper centering of the plunger above the stencil a guide is provided for each punch. These guides are a series of notches 40, arranged in or on the clamping-plate 15 in position to be entered by a tailpiece 41, fixed on the lever 6. An indicator 39 is also arranged on said clamping-plate, as shown, or other part of the die-carrier, and the tailpiece 41 may serve as a pointer therefor. The arrangement of the

indicator and notches are such that when the indicator points out the desired character the depression of the hand-lever 6 causes the tailpiece 41 to enter the corresponding notch, and by bearing against the inclined side thereof turns the die-carrier into exact position.

The operation of the machine is as follows: The stencil to be cut is inserted in proper position between the punches and dies below the stripper-plate. The outer edge of the stencil-blank is laid against the parallel-ruler if the alinement is to be straight or the pin-frame is attached to the shelf and the blank forced over the pin if the alinement is to be circular. Then the die-carrier is turned by a hand-wheel 43, fixed to the shaft, until the indicator shows the desired punch to be in position to be operated on by the plunger. Then the hand-lever 6 is manipulated, whereby the tailpiece 41 thereon at the beginning of its motion enters the guide-notch 40 and by bearing on the side thereof brings the desired die into position to cut the stencil at the exact point desired. This locating or centering of the die is produced simultaneously with the movement of the punch-bar, but before the punch has got into operative contact with the stencil-blank, the punch-bar being moved on its pivot by the plunger 19, which is moved by the hand-lever 6, so as to cut the desired character in the stencil-blank. The same movement of the hand-lever 6 advances the reciprocating bar 23 and the pawl 25 thereon beyond the point of operative contact with the ratchet-wheel 26 without moving said ratchet-wheel. On the back stroke of the lever the punch-bar is raised into its normal position by the plunger depressing its tail, and the tailpiece 41 is raised clear of the guide-notch 40. The pawl 25 is likewise retracted, and in the course of its backward movement comes into operative contact with the ratchet-wheel 26 and turns the same, thereby also turning the gear 28, fixed on the same shaft with the ratchet-wheel, and consequently the gear 29, meshing with said gear 28, and the feed-wheel 30, fixed on the shaft of the gear 29. The steadying-spring 31 insures the accurate spacing of the stencil-feed. This feed movement occurs, on the return stroke of the hand-lever, after the punch has got clear of its die and the stencil-blank, the first portion of the backward stroke of the pawl 25 being lost or ineffective until it comes into operative engagement with its ratchet-wheel 26, as illustrated in dotted lines in Fig. V. The stripper-plate 38 prevents the stencil-blank from rising with the punch.

It is obvious that most of the parts of this machine are equally applicable to a machine in which the dies are arranged in a straight row, similar, for instance, to the machine described in Letters Patent issued to me April 5, 1893. In such a machine the plunger frame or yoke should be movable along the row of punches, carrying along with it the plunger-operating mechanism and the feed-operating

mechanism, including the feed table or shelf. The necessary changes are thought to be sufficiently obvious to require no special description. Obviously, also, the plunger may be arranged to coöperate with the outer ends of the punch-bars or with hooks or projections on said punch-bars.

What I claim is—

1. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary die-carrier on said shaft and stencil-character punches and dies operatively carried on said die-carrier, each of said punches consisting of a rigid bar pivoted at a distance from its ends and with a face-plate fastened thereto flatwise, and a plunger having a notch therein through which the ends of the punch-bars can pass freely, and a hand-lever for operating said plunger, said die-carrier and said plunger being relatively movable, substantially as described.

2. A stencil-machine consisting of a frame, a die-carrier thereon and punches and dies operatively carried on said die-carrier, each of said punches consisting of a rigid bar having a circular notch in one edge to fit over an axle therefor on the die-carrier and having a circular projection on the other edge opposite said notch and having its outer end twisted at right angles to the body portion and a face-plate fastened to said bar flatwise at said outer end, an axle for each of said punch-bars, a clamping-plate bearing against said curved projections, and means for operating any of said punch-bars, said die-carrier and said punch-operating means being relatively movable, substantially as described.

3. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary die-carrier on said shaft, punches and dies operatively arranged in a circular row on said die-carrier, said punches consisting of rigid bars arranged radially edgewise and carrying the design portion on the under side near the outer end, said bars having circular notches in their lower edges to fit over axles therefor and a circular projection on the upper edge opposite said notches to form a bearing-surface, an axle for said punch-bars on said die-carrier, a clamping-plate bearing upon said curved projections, a plunger having a notch through which the coöperating part of said punch-bars may pass and means for operating said plunger, said plunger and said die-carrier being relatively movable, substantially as described.

4. A stencil-machine consisting of a frame, a vertical shaft supported thereby, a rotary die-carrier on said shaft, punches and dies operatively arranged in a circular row on said die-carrier, said punches consisting of rigid bars arranged radially edgewise and carrying the design portion on the under side near the outer end, said bars having circular notches in their lower edges to fit over axles therefor and circular projections on the upper edges opposite said notches to form bearing-sur-

faces, an axle for said punch-bars on said die-carrier, a clamping-plate bearing upon said curved projections, a plunger having a notch through which the inner ends of said punch-bars may pass and means for operating said plunger, said plunger and said die-carrier, being relatively movable, substantially as described.

5 The combination with a stencil-machine
10 having feeding-rollers of a framework detachably secured thereto, a sliding spring-clip thereon and a pin fastened to said clip, substantially as and for the purpose set forth.

6. In combination with a rotary stencil-
15 machine having its punches arranged radially and having a plunger adapted to operate on the inner ends of said punches and a lever for operating said plunger, a feed mechanism consisting of a reciprocating bar adapted to
20 be operated by an arm on said lever, a pawl on said bar adapted to be advanced beyond the point of operative contact with a ratchet-

wheel, a ratchet-wheel cooperating with said pawl and fixed to a shaft which carries a gear-wheel, a second gear-wheel meshing with the
25 first-mentioned gear-wheel and a feed-wheel fixed on the same shaft therewith, and an idle-wheel journaled on a movable shaft whereby it can be moved to and from said feed-wheel, substantially as and for the pur-
30 pose described.

7. A punch consisting of a rigid bar whose end portion is twisted at right angles to the body, said punch having a circular notch in one edge and a circular projection on the
35 other edge opposite said notch, and a face-plate secured flatwise to said end portion of the bar, substantially as and for the purpose set forth.

ANDREW J. BRADLEY.

Witnesses:

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T. PERCY CARR.