

No. 675,786.

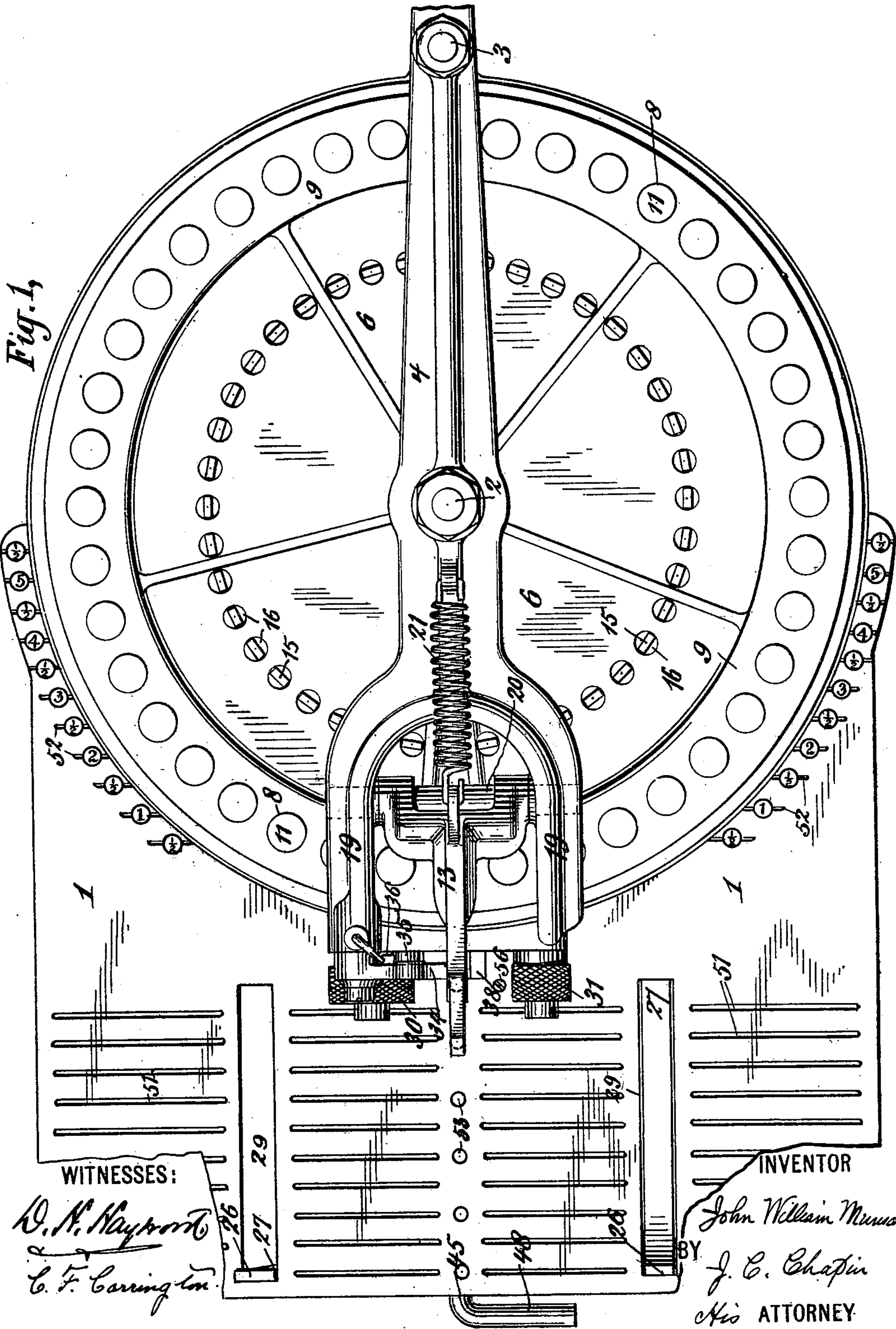
Patented June 4, 1901.

J. W. MUNSON.  
STENCIL CUTTING MACHINE.

(Application filed July 5, 1900.)

(No Model.)

3 Sheets—Sheet 1.





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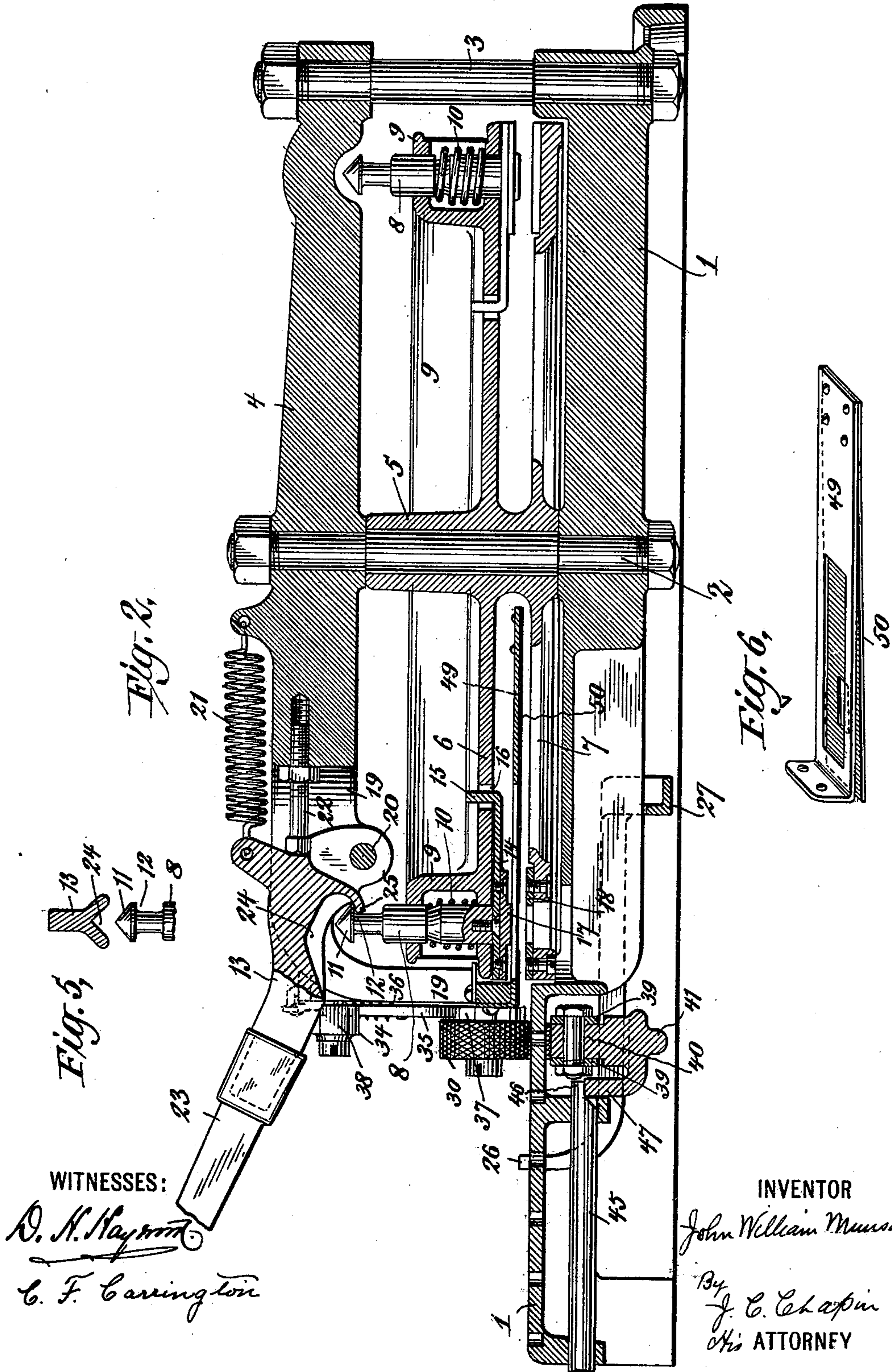
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3 Sheets—Sheet 3.

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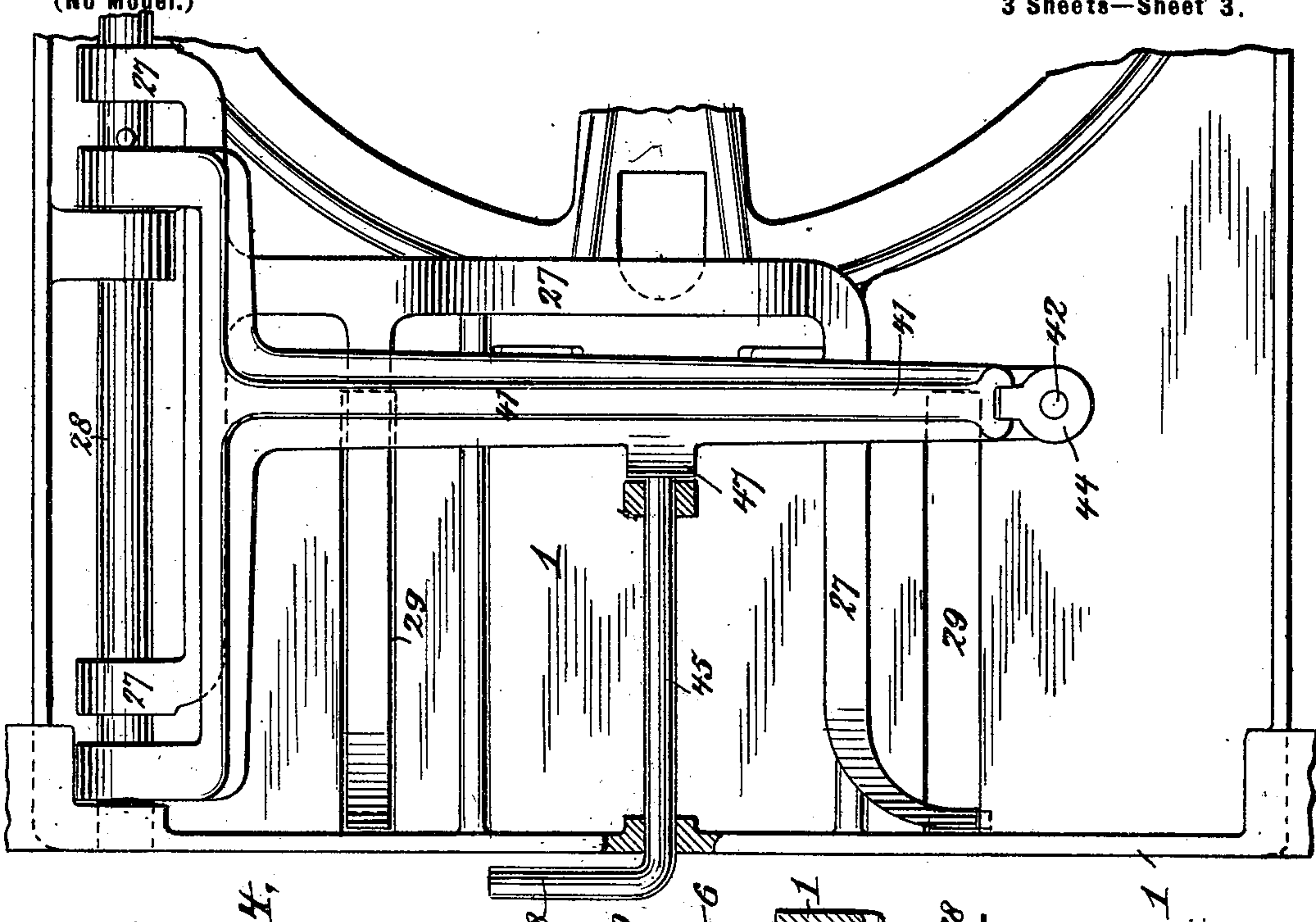


Fig. 4.

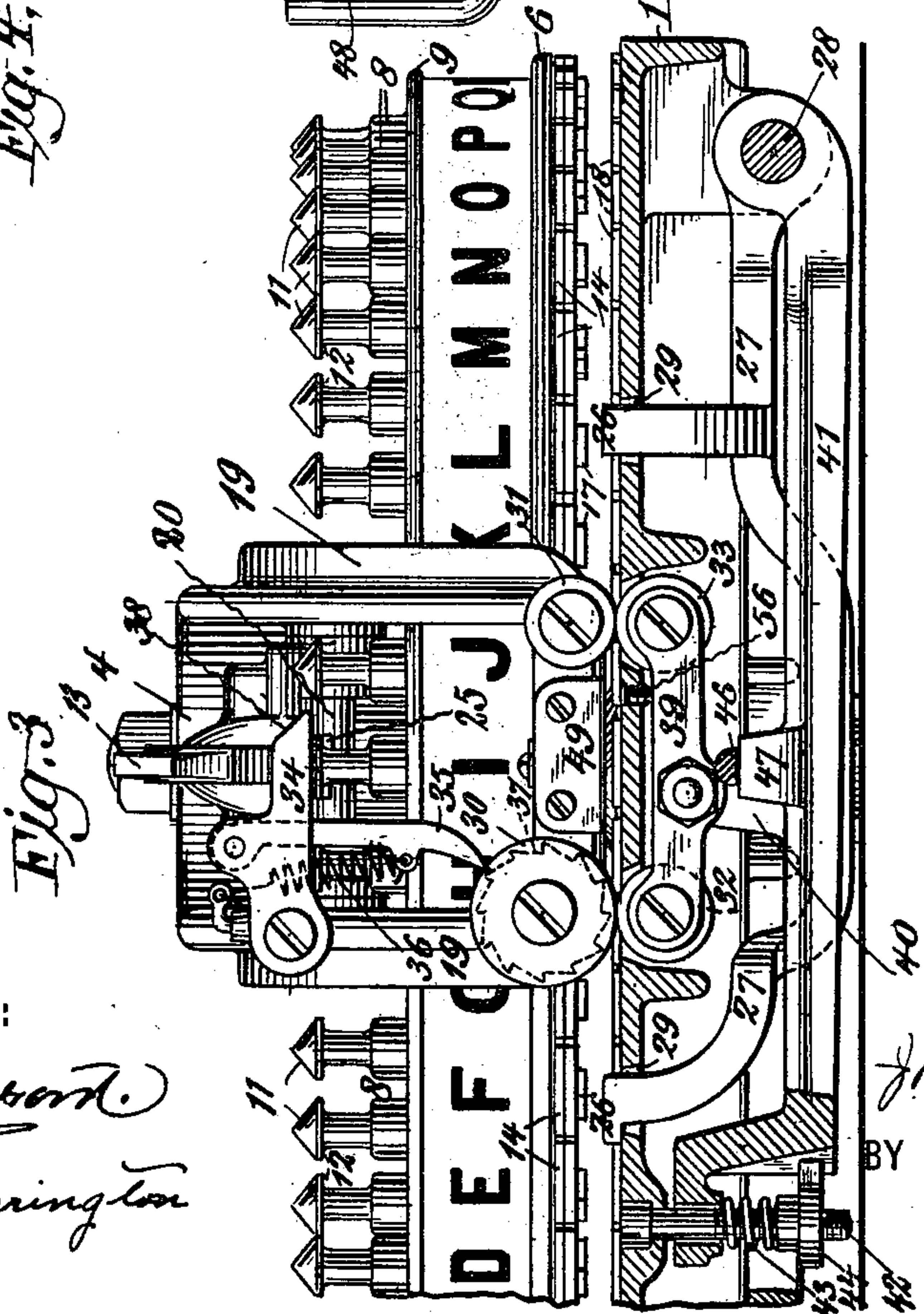
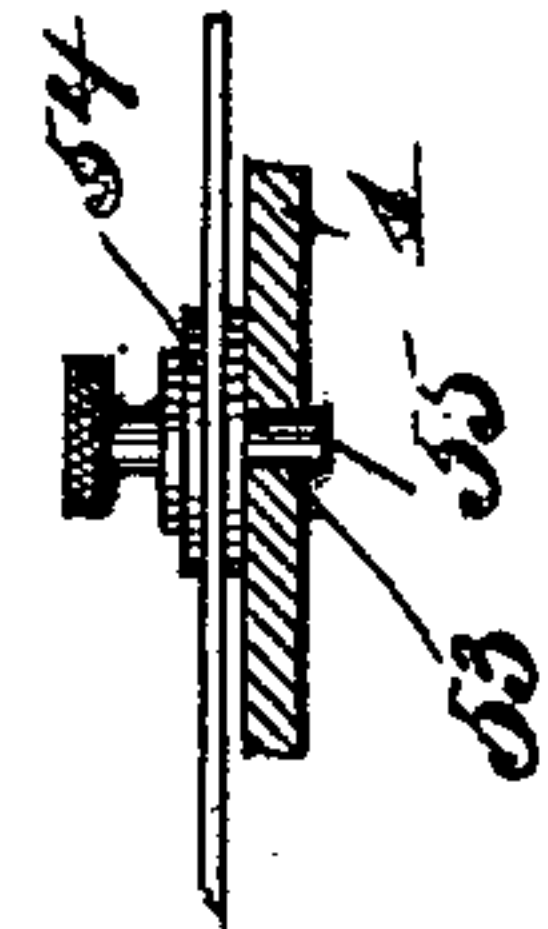


Fig. 3.

Fig. 7.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JOHN WILLIAM MUNSON, OF NEW YORK, N. Y., ASSIGNOR TO D. HOWARD HAYWOOD, OF SAME PLACE, AND JAMES C. CHAPIN, OF ENGLEWOOD, NEW JERSEY.

## STENCIL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 675,786, dated June 4, 1901.

Application filed July 5, 1900. Serial No. 22,522. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN WILLIAM MUNSON, a citizen of the United States of America, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Stencil-Cutting Machines, of which the following is a specification.

My invention relates to improvements in stencil-cutting machines; and it consists in the novel arrangement, construction, and combination of parts, as will hereinafter be more fully set forth.

The objects of my invention are to improve and simplify the construction of stencil-cutting machines, to decrease the number of the working parts, to increase the accuracy of the operation of the machine, and to render easier the manipulation of the same. I attain these objects in and by the machine herein described and as illustrated in the accompanying drawings.

I will now proceed to describe a stencil-cutting machine embodying my invention, and will then point out the novel features in claims.

In the drawings, Figure 1 represents a top view of a stencil-cutting machine embodying my invention. Fig. 2 represents a central longitudinal section of the same. Fig. 3 represents a partial front elevation, certain parts being broken away in order to better illustrate certain other parts. Fig. 4 is a view looking upwardly at the front end of the machine. Fig. 5 is a detail cross-sectional view of an operating-lever employed, showing the same in engagement with the head of one of the plungers. Fig. 6 is a detail view of a compound stripper employed. Fig. 7 is a detail view showing a pivotal support for a piece of stencil material for use at such times as it is desired to cut a stencil in a curved line.

Similar reference characters designate corresponding parts in the several figures.

The base of this machine is formed, preferably, of a single casting, which serves as a support for the rest of the parts going to make up the machine. This casting is designated in the drawings by the reference character 1. Upon the base 1 is rigidly secured a central

vertical pivot-bolt 2, and a second bolt or standard 3 is secured to the base at its rear end. It will be understood that in the description of the machine herein that portion of the machine which is to the left in looking at Fig. 2 of the drawings is considered to be the front end of the machine. A yoke-bar 4 is secured to the base 1 by means of threaded extensions of the bolts 2 and 3 and nuts engaging therewith. The bolts 2 and 3 have enlarged central portions which are shouldered down to engage with the lower face of the yoke-bar 4 and the upper face of the base 1, and by this means the yoke-bar and the base are maintained in their correct relative positions toward each other.

Rotatably mounted upon the central bolt 2 is a supporting-frame 5, which is arranged to support the punches and dies. This frame comprises a central hub-like portion which fits between the yoke-bar and the base and is thereby held against longitudinal movement relatively to the bolt, but is permitted to rotate upon the same; and two disk-like portions which branch from the said hub-like portion. The upper disk-like portion 6 is adapted to carry a plurality of punches, and the lower disk-like portion 7 is adapted to carry a plurality of dies. The punches are mounted in and upon the upper disk-like portion 6 at or near its outer edge. In this instance, as shown in the drawings, there are so mounted forty of these punches; but there may of course be a greater or less number. I will describe one of these punches in detail, and it will then be understood that the description of this one applies equally to the remainder.

Reference character 8 designates a plunger to the lower end of which is secured in a manner to be hereinafter more fully set forth the punch-plate or punch proper. The main body portion of the plunger is cylindrical and is fitted in a cylindrical orifice in the disk-like portion 6 of the supporting-frame 5. The disk-like portion 6 has an uprising extension 9 near its outer edge, which rises upwardly and then flares outwardly for a short distance parallel with the main portion of the disk. A second cylindrical orifice is arranged in that portion of the extension 9 which is par-



allel with the main disk-like portion 6 and in a line with the aforementioned orifice therein. The plunger 8 passes through both these orifices and in this way has two bearings provided for it at some distance apart, with the result that it is held steady at all times and the relative position of the punch-plate secured thereto is correctly maintained. A spring 10 is coiled around the plunger 8 and bears at one end against the disk-like portion 6 and at the other end against a shoulder upon the plunger 8. The tendency of the spring 10 at all times is to force the plunger upwardly.

The upper end of the plunger is provided with a conical-shaped head 11, and beneath the head 11 is a recessed portion 12. The conical head 11 constitutes the operating-head of the plunger and is adapted to engage with or be engaged by an operating-lever 13 in a manner to be more fully described hereinafter.

Secured to the lower end of the plunger 8 is a flat plate 14, which plate serves the double function of a backing or support for the punch-plate and a guide for preventing the plunger from rotation. The plate 14 is firmly secured to the plunger 8 by means of a heavy central screw, and the inner end of the said plate, or that end which is toward the pivot-bolt 2, is turned upwardly, as at 15, and passes through an orifice 16 in the disk-like portion 6 of the supporting-frame 5. The turned-up portion 15 is of such length that it will always remain in engagement with the disk-like portion 6 within the recess 16 whether the plunger is in its depressed position or in its normal upward position, as shown in the drawings. Such engagement will positively prevent rotation of the plunger upon its axis. A punch-plate 17 is secured to the plate 14, preferably by two screws, as shown. By the foregoing arrangement and construction I am enabled to easily and securely attach a punch-plate to the plunger without weakening the punch-plate or interfering with the letter or character thereon. The central or projecting portion of the punch-plate 17 will of course be that portion of the plate which acts as a punch and which is cut into the shape of the letter or character which it is desired to reproduce as a stencil. By reference to the drawings it will be seen that by use of the intermediate plate 14 I am enabled to arrange the screws or attaching devices well away from the central portion.

The lower disk-like portion 7 of the frame 5 carries the dies, one of which is provided for each of the punches. One of these dies, as shown in Fig. 2 of the drawings, is immediately below the punch just described and is designated by reference character 18. These dies or die-plates may be secured to the lower disk-like portion 7 by means of screws, as shown, or in any other desired manner.

In machines of this description it is absolutely essential that the die-plates shall be maintained absolutely in perfect alinement

with their respective punches. The common practice heretofore has been to provide two separate disks answering to the disk-like portions 6 and 7, which have then been bolted together. I have found by experience that it is a matter of great difficulty to maintain extreme accuracy of alinement in such construction, and for this reason I have provided a punch and die support which consists of one integral piece comprising two disk-like portions cast together upon a single hub, as shown. In this arrangement and construction it would be a matter of impossibility for the support for the punches to get out of alinement with a support for the dies.

The aforesaid operating-lever 13 is arranged between the bifurcated end 19 of the yoke-bar 4 and is pivotally mounted upon a stud 20, secured thereto. A spring 21 tends to pull the lever 13 upwardly and to hold it in its normal upward or returned position. An adjustable bolt 22, secured to the yoke-bar 4, forms a stop to limit the upward movement of the said lever. A handle 23 of the desired length and shape may be secured to the lever 13 and is employed for the purpose of operating the same. The under side of the lever 13 at that point which is opposite to the conical heads 11 of the plungers 8 has formed therein a V-groove, the sides of which are formed at angles corresponding to the angles formed by the said conical heads. When, now, the lever 13 is depressed, the conical groove 24 will engage with the conical head 11 of that plunger which has been brought beneath it, and further movement downwardly of the lever 13 will depress the plunger and cause the engagement of the punch and die for the purpose of cutting the stencil. Upon the release of the lever 13 the return-spring 21 will carry the same upwardly, and a projection 25, with which the lever is provided, will engage with the recess 12 of the plunger and will positively draw the same upwardly with it. The springs 10 also tend to draw the plungers upwardly and hold the said plungers in their upward position when they are out of engagement with the said operating-lever. With the lever in its upward position, as shown in the drawings, the carrying-frame 5, with the punches and dies mounted thereon and carried thereby, may be freely rotated upon the central bolt 2. By this means that particular punch and die which it is desired to use may be brought beneath the lever 13. Should the plunger carrying the punch be brought to such a position as to be not quite in proper line—that is to say, it is not quite centered beneath the lever—the engagement of the conical recess 24 with the conical head 11 will move the carrying-frame the necessary distance to correctly locate the punch and die in order to cut the stencil in its proper place.

The material of which the stencil is to be made, which may be a strip of paper, will rest for a portion of its width and length upon



the front end of the base 1, which front end is arranged as a table to receive same. A portion of the width of the paper will extend within the machine between the disk-like portions of the carrying-frame and will partially rest upon the dies 18. The front end of the paper may rest against and be guided by fingers 26 26, which form part of a guide-yoke, (designated as a whole by the reference-character 27.) The guide-yoke 27 is supported at one side upon a shaft 28 and upon the other side by an overhanging portion of one of its fingers 26, which rests for this purpose upon the table-like portion of the base 1. The guide may be adjusted inwardly or outwardly, according to the position it is desired that the paper shall assume.

The table portion of the bed-plate 1 has preferably marked thereon a number of transverse lines or grooves 51, which may, if desired, have index-numbers marked against them and by which the stencil material may be located. A plurality of transverse lines or grooves 52 may also be provided, by which the position of the inner edge of the stencil-strip may be correctly located with reference to the center of the punch beneath the lever 13.

Slots 29 29 are cut out of the table-like portion of the base for the purpose of permitting the travel of the fingers 26 26. In Figs. 1 and 4 the said guide, as shown, is moved to its outer extremity. In Fig. 2 it is adjusted inwardly a portion of the distance to which it may be adjusted.

30, 31, 32, and 33 designate feed and pressure rollers between which the stencil-strip is arranged to travel. The upper rollers 30 and 31 are mounted at or near the ends of the bifurcated extension of the yoke-bar 4. The roller 31 is an idler and the roller 30 constitutes a feed-roller.

The feed is effected in the following manner: A feed-lever 34 is pivotally mounted upon one of the extending arms 19 of the yoke-bar 4, and the said lever carries a feed-pawl 35. A spring 36 tends to move the feed-lever 34 upwardly and to hold it in its upper position and also tends to force the pawl inwardly. The feed-wheel has secured to it or formed as a part of it a ratchet-wheel 37, the teeth of which the pawl 35 is adapted to engage. The feed-lever 34 rests normally against the under side of the operating-lever 13. Upon the first portion of the downward movement of the operating-lever 13 the feed-lever 34 is forced downwardly and the feed-pawl 35 by its engagement with the teeth of the ratchet-wheel 37 will rotate the feed-wheel 30 and feed the paper forward the required distance. Upon the further downward movement of the operating-lever 13 the feed-lever 34, by reason of the arc through which it travels, will pass out of the path of movement of the operating-lever, and the beveled end 38 of the said feed-lever 34 will rest against the side of the said operating-lever

during its further downward movement. It will be seen that by this arrangement the first portion of the downward movement of the operating-lever 13 will effect the feeding of the paper in which the stencil is desired to be cut forwardly and that after such feed of the paper has taken place the desired letter or character will be cut by the punch and die. The punch and die will of course not come into engagement with each other for the purpose of cutting the stencil until after the feeding of the paper has been completed.

The pressure-rollers 32 and 33 are mounted upon an equalizing-bar 39, which is fulcrumed upon an uprising lug 40, secured to or made a part of a lever 41. The lever 41 is loosely mounted upon the shaft 28 and at its upper opposite end embraces a steady-pin 42, which is mounted in the base 1 of the machine. A spring 43 bears at one of its ends against the end of the said lever 41 and at the other of its ends against an adjustable nut 44. The adjustable nut 44 is threaded upon the steady-pin 42 and is prevented from accidentally turning by an engagement with the lever 41, as shown. The adjustment of the tension of the spring 43 may be effected by rotating the steady-pin 42, which may conveniently be accomplished by means of the engagement of a screw-driver with the slotted head of same. Access to this head may be obtained from above the base of the machine. The pressure of the spring 43 tends to force the lever 41 upwardly, and the cross-bar 39, being secured thereby, maintains the pressure between the pressure and feed rollers. The cross-bar 39, being pivotally connected to the lever 41, transmits an equalized pressure to the said rollers, so that a single spring tends at all times to press all the rollers together with a predetermined amount of force.

45 designates a shaft mounted in suitable bearings in the base of the machine and having at its inner end a portion cut away, by which is formed a cam or eccentric 46. A lug 47 upon the lever 41 bears against the said cam or eccentric. By rotating the shaft 45 the lever 41 may be forced downwardly against the pressure of the spring 43 and the pressure-rollers 32 and 33 thereby withdrawn from contact or pressure with the rollers 30 and 31. This is for the purpose of permitting the release of the paper when the desired stencil has been cut and for the purpose of removing the paper or permitting the insertion of a new strip of paper for the purpose of cutting a stencil therein. The other end of the shaft 45 is provided with a handle 48, which is here shown as a portion of the said shaft bent over to form the same and by which the shaft 45 may be conveniently rotated.

For the purpose of cutting a stencil in a curved line, if so desired, I have provided the table portion of the base 1 with a number of orifices 53. In Fig. 7 I have illustrated a clamp and support for a stencil-sheet which is adapted to coact with any one of the ori-



fices 53. When it is desired to cut the stencil upon the curved line, the stencil material will be mounted upon a clamp-support, such as is shown at 54 in Fig. 7, and the pin 55 thereof will be engaged with one of the orifices 53, which is the desired distance from the center of the punch beneath the lever 13, and by using the pin 55 as a center of rotation the stencil material may be fed in such a way as to produce the stencil cut in the curved line desired.

When cutting a stencil on a curved line, it would be undesirable that the feed-wheel and the idler 31 and 33 should remain in close engagement with the said material. For the purpose of causing the said wheels to become disengaged I have provided a threaded pin 56, which is adjustably mounted in the table portion of the base 1 at a point just above the equalizing-lever 39 and upon that side of the center thereof at which the idler-wheel 33 is mounted. By turning the adjustable screw 56, so that it is forced downwardly the equalizing-lever 39 will be rocked upon its fulcrum or support and the idler 33 will be moved out of engagement with the feed-wheel 31, while the feed-wheel 30 will remain in intimate engagement with the idler 32. The operation of the feed-wheel 30 against the feed-wheel 32 will feed the stencil material in a curved line, while the pressure of the two feed-wheels 30 and 31 against the idlers 32 and 33, when the adjusting-screw has been moved upwardly, will cause the feeding of the stencil material in a straight line.

For the purpose of stripping the paper away from the punch I have provided a compound stripping-plate comprising two sheets of metal secured together at one end. The upper sheet is of comparatively heavy metal and is rigid, while the lower sheet is of comparatively thinner material and is flexible. The upper sheet, which is designated by the reference character 49, is rigidly secured at its outer end to the yoke-bar 4 and is provided with a recess large enough to permit the punch and its supporting-plate to pass therethrough. The lower flexible sheet of metal, which is designated by the reference character 50, is secured to the upper plate at or near its inner end and has a recess therein large enough only for the letter or character of the punch to pass therethrough. Such a device forms a very much more effective stripper than the single stripping-plate commonly in use heretofore.

By my arrangement and construction of parts I have produced a machine which is simple and inexpensive in construction, positive and accurate in its operation, and easy of manipulation.

What I claim is—

1. In a stencil-cutting machine, the combination with a frame, of a plurality of punches or dies, each punch or die, as a whole, consisting of three separate pieces secured to-

gether, said pieces being a cylindrical plunger, a punch or die-supporting plate, and a punch or die proper, the said punch or die-supporting plate having a lateral extension which engages with the frame, and permits reciprocating movement of the plunger relatively to the frame but prevents rotary movement thereto.

2. In a stencil-cutting machine, the combination with a movable punch and punch-supporting plate of a compound stripper comprising a rigid plate, having an orifice through which the punch-supporting plate is adapted to pass, and a flexible plate secured at or near one of its ends to the rigid plate, and having an orifice through which the punch only is adapted to pass.

3. In a stencil-cutting machine, the combination with feed-rollers of pressure-rollers arranged to bear against same, the said rollers mounted upon an equalizing-beam, a pivoted pressure-lever upon which said equalizing-beam is fulcrumed, and means for forcing the said pressure-lever in one direction.

4. In a stencil-cutting machine, the combination with feed-rollers of pressure-rollers arranged to bear against same, the said rollers mounted upon an equalizing-beam, a pivoted pressure-lever, upon which said equalizing-beam is fulcrumed, a spring normally tending to force the pressure-lever in one direction, and hand-operated means for moving the lever in the opposite direction against the pressure of the spring.

5. In a stencil-cutting machine, the combination with a punch-operating lever of a pivoted feed-lever, the free end of which lies normally in the path of the said operating-lever, a pawl pivoted to the said feed-lever, a feed-wheel operated by the pawl, and a return-spring for returning the feed-lever and pawl to its normal position, the said feed-lever adapted to be operated by the operating-lever during the first portion of the movement of the same, and to swing upon its pivot, out of the path of movement of the said operating-lever during the second portion of the movement of the same.

6. In a stencil-cutting machine, the combination with feed-rollers, or pressure-rollers arranged to bear against same, the said rollers mounted upon an equalizing-beam, a pivoted pressure-lever upon which said equalizing-beam is fulcrumed, means under elastic tension for forcing the said pressure-lever in one direction, and means whereby one end of said equalizing-beam may be forced downwardly against the pressure of said means under spring tension.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN WILLIAM MUNSON.

Witnesses:

JNO. S. PARKER,

C. F. CARRINGTON.