

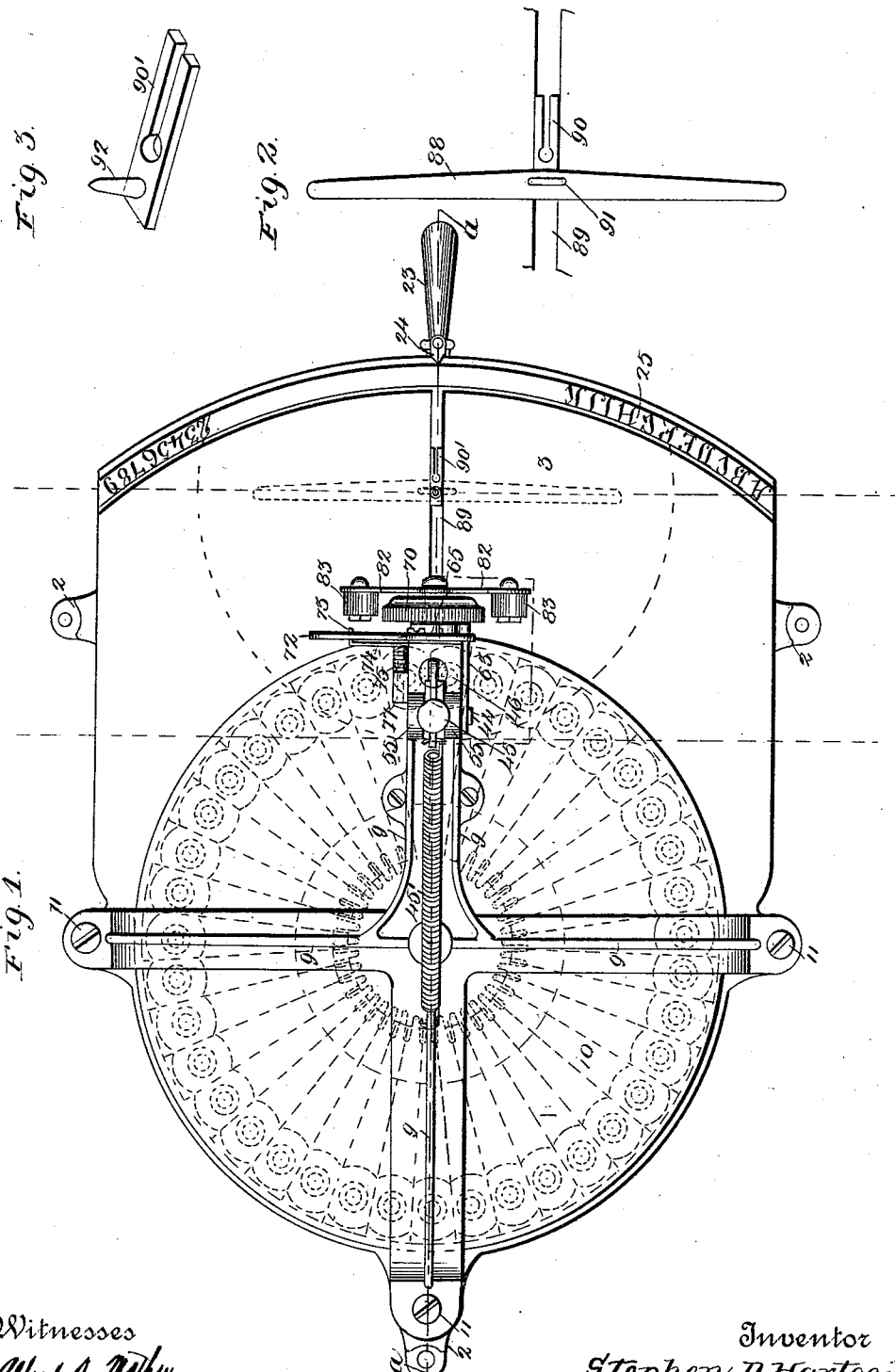
(No Model.)

4 Sheets—Sheet 1.

S. D. HARTOG, Jr.
STENCIL CUTTING MACHINE.

No. 561,990.

Patented June 16, 1896.



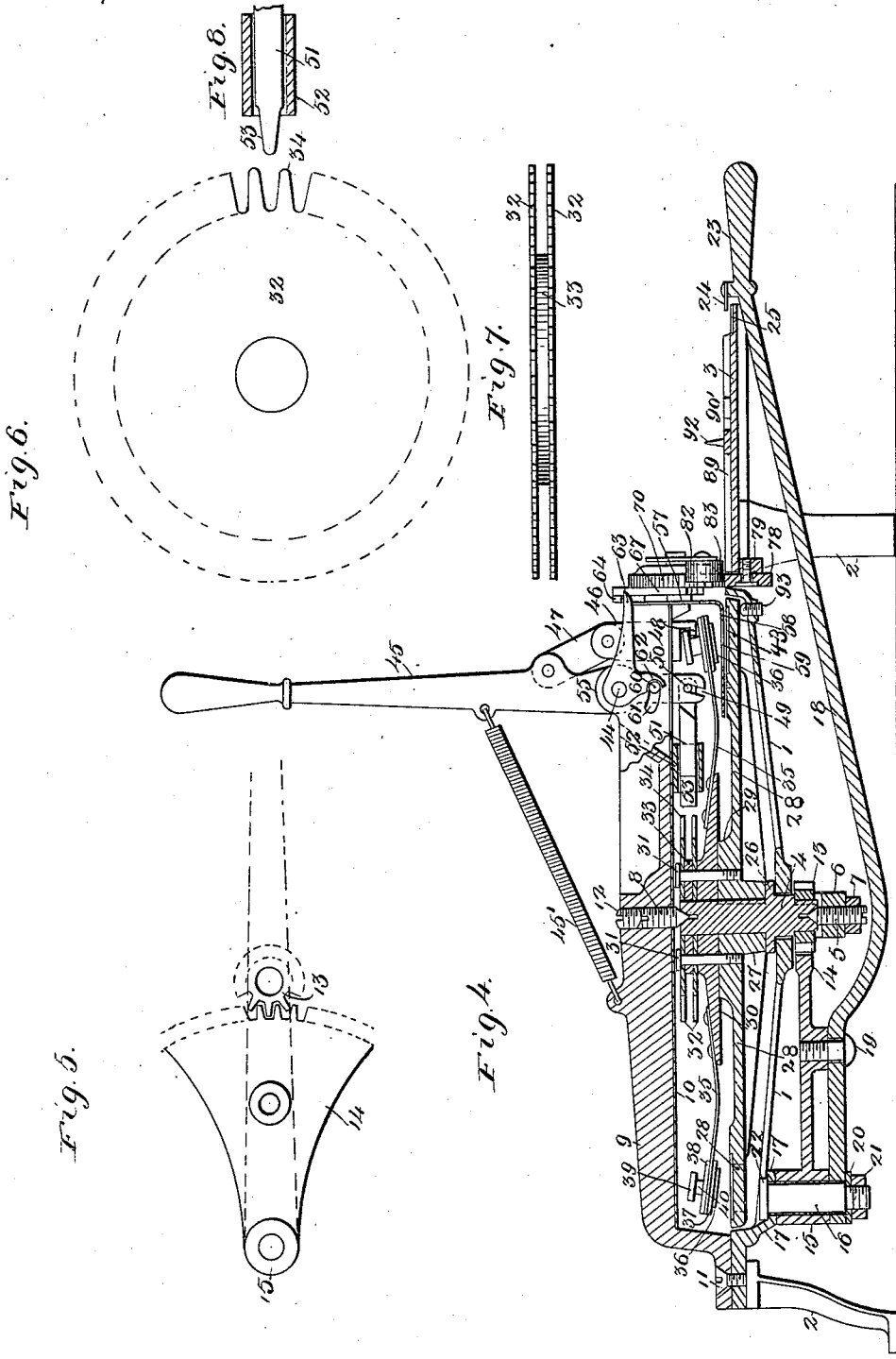
Witnesses
Alfred D. Mahony
H. D. Woodland

Inventor
Stephen D. Hartog, Jr.
By *his Attorneys*
Keller & Seare

S. D. HARTOG, Jr.
STENCIL CUTTING MACHINE.

No. 561,990.

Patented June 16, 1896.



Witnesses
 Alfred A. Mathey
 [Signature]

Inventor
 Stephen D. Hartog, Jr.
 By his Attorneys
 Keller & Storer

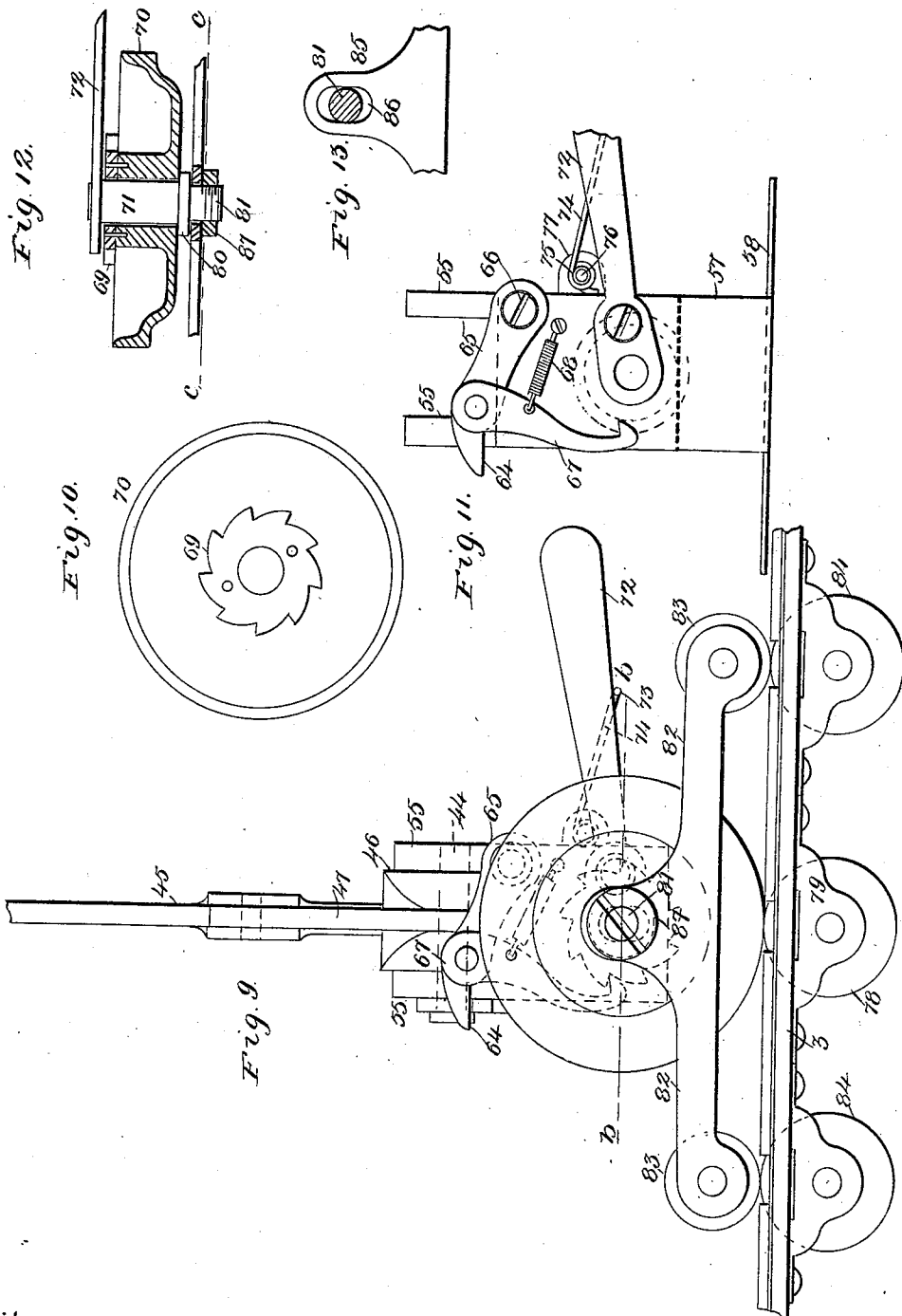
(No Model.)

4 Sheets—Sheet 3.

S. D. HARTOG, Jr. STENCIL CUTTING MACHINE.

No. 561,990.

Patented June 16, 1896.



Witnesses
Alfred D. Mathey
W. H. Woodcock

Inventor
Stephen D. Hartog, Jr.
 By his Attorneys
Keller & Storer

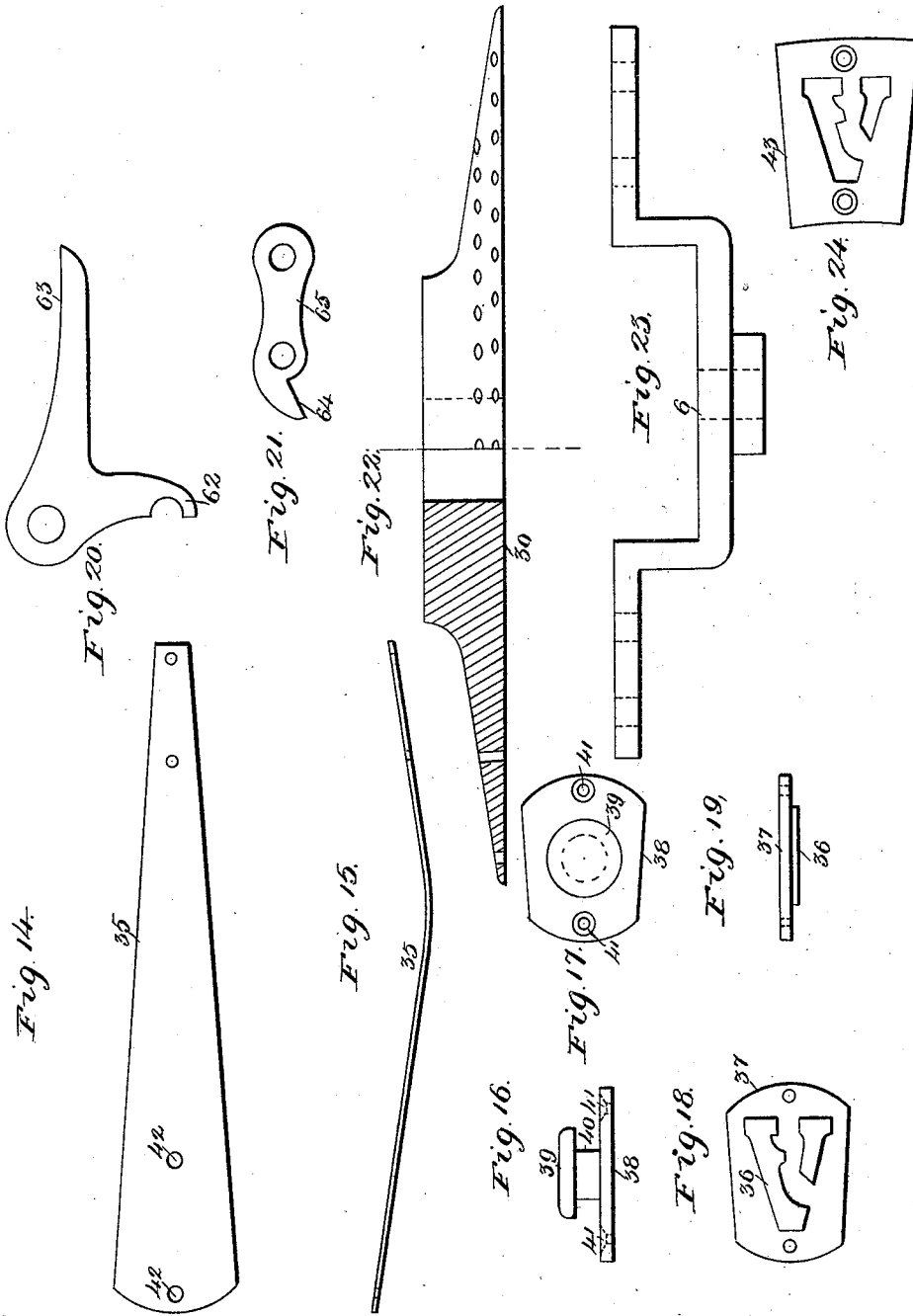
(No Model.)

4 Sheets—Sheet 4.

S. D. HARTOG, Jr.
STENCIL CUTTING MACHINE.

No. 561,990.

Patented June 16, 1896.



Witnesses
Alfred A. Mather
[Signature]

Inventor
Stephen D. Hartog, Jr.
By his Attorneys,
Keller & Storer

UNITED STATES PATENT OFFICE.

STEPHEN D. HARTOG, JR., OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE
EUREKA STENCIL MACHINE COMPANY, OF SAME PLACE.

STENCIL-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 561,990, dated June 16, 1896.

Application filed January 23, 1896. Serial No. 576,495. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN D. HARTOG, Jr., a citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Stencil-Cutting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in stencil-cutting machines; and it consists in the novel arrangement and combination of parts, more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a top plan view of my improved machine. Fig. 2 is a detail plan view of the guide-bar for the paper. Fig. 3 is a detail plan view of the adjustable pivotal pin used on sheets intended for circular stenciling. Fig. 4 is a middle vertical section on the line *a a* of Fig. 1. Fig. 5 is a bottom plan view of the toothed arc and pinion controlling the rotating die-plate. Fig. 6 is a plan view of the superposed toothed plates carried by the rotating die-plate and constituting a part of the retaining and centering mechanism for the die-plate and to be presently described. Fig. 7 is a side elevation of the same. Fig. 8 is a plan view of one end of the reciprocating bar which coöperates with the teeth of said plates. Fig. 9 is a front view or elevation of the feed mechanism. Fig. 10 is an inner plan view of the main feed-disk and ratchet carried thereby. Fig. 11 is a front elevation in detail of the mechanism controlling the main feed-disk, the disk itself being removed from this figure. Fig. 12 is a detail middle section, taken on line *b b* of Fig. 9, of the feed-disk and ratchet-arm carrying the same, and the roller-bracket carried by it, with parts broken away. Fig. 13 is a detail elevation showing the manner of supporting the roller-bracket to the pivotal pin of the main feed-disk, the pin being in section on line *c c* of Fig. 12. Fig. 14 is a plan view of one of the spring-arms on which the punch-characters are mounted. Fig. 15 is a side elevation of the same. Fig. 16 is an elevation of the button-plate superposed over each character-punch. Fig. 17 is a plan view of the same. Fig. 18 is a plan view of one of the

punches or punch-characters. Fig. 19 is a side elevation of the same. Fig. 20 is a side elevation of the gravity lifting arm forming a part of the feed mechanism. Fig. 21 is a detail of the finger controlled by the aforesaid arm. Fig. 22 is a part elevation and part section of the conical block to which one end of each of the spring-arms carrying the punches is secured. Fig. 23 is a side elevation of the bracket forming the basal support for the spindle of the rotating die-plate, and Fig. 24 is a plan view of one of the dies with which the punches coöperate.

The object of my invention is to construct a stencil-cutting machine—that is, one intended to cut stencil characters, addresses, &c., from sheets of paper, thin metal, and the like, commonly known as “stencil-plates.”

A further object is to construct a machine which shall be characterized by perfect accuracy of coöperation among its several parts; one which shall insure a perfect and smooth edge to the stencil-characters cut in the paper; one in which the punch shall at all times squarely enter its corresponding die—that is, without any lateral binding—thus insuring the clean cut above referred to; one wherein the parts are thoroughly adjustable and work with a minimum amount of friction, and one presenting further and other details to be hereinafter more particularly referred to.

In general the invention consists of a suitable frame carrying the several parts; of a rotating die-plate and corresponding punches mounted on said frame; of a suitable operating-lever controlling a plunger for depressing the several punches brought successively under the same; of suitable mechanism between the operating-lever and rotating die-plate for properly centering and bringing each punch (or center thereof) in the direct line of action of the plunger and firmly holding or retaining the die-plate against rotation during the punching operation; of suitable means for supporting the periphery of the die-plate at the base of each die operated on; of suitable means for adjusting the bearings for the die-plate and parts carried thereby; of suitable feed mechanism for operating, when necessary, on circular sheets of paper or stenciling along the arc of a circle, and of other mi-

nor and further details to be hereinafter particularly described.

In detail the invention may be described as follows:

5 Referring to the drawings, 1 represents a basin-shaped frame supported on suitable legs 2, an operating table or extension 3 forming a part of said frame. The central portion of the basin has an opening for the reception of the lower end of a rotating spindle 4, the base of the spindle being supported by and adapted to revolve about the conical end or bearing of an adjustable screw-threaded bolt 5, passing through the medial member of a supporting-bracket 6, carried at and secured to the base of the frame 1, the bolt 5, when once adjusted, being held in place by a nut 7, bearing against the bottom of the bracket. The upper end of the spindle 4 similarly revolves about the conical end of an adjustable screw-threaded bolt 8, passed through the meeting-point of the ribs 9, which stiffen and form an integral part of a general cover-plate 10, by which ribs said plate is secured to the frame 1 by screws 11. The bearing 8, when once adjusted, is retained in place by a superposed retaining-bolt 12, screwed above the same. The lower end of the spindle 4, projecting below the bottom of the basin of the frame 1, has keyed thereto a pinion 13, which is adapted to mesh with a toothed segmental arc 14, whose pivotal end has formed integrally therewith a sleeve 15, adapted to be passed about the smooth portion of the pivotal pin 16, depending from an arm 17 of the frame. The lower end of the smooth portion of the pin 16 is embraced by and forms the pivotal point for the short arm of a horizontally-swinging lever 18, connected or secured to the toothed arc, along the lower surface thereof, by means of a bolt 19, passing through approximately the medial portion of the said segmental arc. The reduced lower projecting end of the pivotal pin 16 is screw-threaded, said screw-threaded end being adapted to receive a washer 20 and nut 21 to prevent the movement of the pin in one direction, an expanded head 22, formed at the opposite end thereof, preventing movement of the same in the opposite direction, and thus securing the pin in place.

From the connections described it is apparent that if the lever 18 be swung around horizontally about its pivotal pin 16 it will swing the arc 14 with it about its pivotal pin, the arc in turn rotating the pinion 13 and the spindle 4, to which it is secured. The handle portion 23 of the lever 18 carries an index 24, cooperating with the index-characters 25, marked along the outer curved edge of the operating-table 3, said characters corresponding with and representing those carried by the punches and dies, the machine being so mounted that the particular punch-character and die brought under the plunger (and to be stenciled in the paper) will always correspond to the character with which the index

cooperates as it is swept about the curved edge of the operating-table. Forming an integral part of the spindle 4 and located above the supporting-base of the frame is a flange or annular shoulder 26, adapted to support the central tubular bearing 27 of the circular die-plate 28, keyed to the spindle. The die-plate has a central raised ridge 29, provided with an upper flat surface, on which is adapted to rest a conical-shaped block 30, of dimensions sufficient to overlap the edge of the ridge 29, said block having a central opening adapted to pass over the spindle 4 and being firmly secured to the die-plate by bolts 31. Supported on a central ridge of the block 30 are two circular plates 32, separated a slight distance by an intervening disk 33, said plates and disk being secured to the block 30 by the same bolts 31 that secure the latter to the die-plate. (See Fig. 4.) The plates 32 have formed therein the alining peripheral teeth 34, having inclined walls, as best seen in Fig. 6. Along the outer inclined surface of the overlapping edge of the block 30 are secured a series of punch-supporting spring-arms 35, deflected upwardly about their medial portions, so as to hold the punches carried by their free ends normally at an incline to the plane of rotation of the dies located immediately below them, so that when the punches are driven into the dies they may enter the latter truly at right angles to the plane of rotation of the said dies, thus reducing any binding tendency to a minimum.

From the description of the parts thus far it is apparent that upon the rotation of the spindle 4, under the action of the swinging lever 18, the die-plate and the punches mounted above it and the plates 32 will revolve together as a unit. To the under side of the free end of each arm 35 is secured the character-punch, each punch being formed by depressing or forcing out the character from a suitable metallic plate or blank 37, according to a process described in my pending application, Serial No. 524,606, filed October 1, 1894, and securing said blank to the under surface of the arm 35, with the punch-character projecting outwardly therefrom. Secured also to the arm 35 and directly opposite the punch so mounted is a similarly-shaped blank or plate 38, having a central projecting cap or button 39, connected by the neck 40. The openings 41 of the plate 38 are countersunk to allow the heads of the bolts securing the punches and cap-plates to the spring-arms to enter flush with the surface of the plates 38.

The openings 42, formed in the spring-arms for the reception of the bolts, are somewhat larger than the diameters of the bolts to allow for slight lateral movement of the bolts passing through them and thus for the consequent accurate adjustment of the parts just referred to. The dies (see Fig. 24) for the punches are cut out of suitable blanks 43, the latter being mounted along the outer edge of

the circular die-plate 28 over clearance-openings of approximately the same outline and dimensions, each blank being sunk sufficiently into the plate to be flush with the upper surface thereof. (See Fig. 4.)

Between the lugs 55 of the forked end of one of the ribs 9, forming a part of the cover-plate 10, is passed transversely a pin 44, forming the pivotal point for the operating-lever 45, the latter being held normally in a vertical position by a controlling spring 45', having one end secured to the lever and the other end to the rib on which the lever is mounted. Guided between the forked ends of the rib referred to is a reciprocating plunger 46, whose upper end is connected to the operating-lever 45 by a link 47, the plunger or the line of action of the same being directly over the series of punches carried by the arms 35. The plunger is provided at its base with an inwardly-projecting finger 48, adapted to pass under the cap or button 39 of each of the series of cap-plates, the button itself being adapted to be depressed by the plunger. The object of the finger 48 is to assist the spring-arms carrying the punches to assume their normal position after they have done their work in cutting the stencil-characters in the paper or other stencil-plate operated on, the plunger itself of course being drawn up by the lever 45 as the latter resumes its normal position under the action of the spring 45'. The free end of the short arm of the lever 45 has an inclined slot 49, which is adapted to receive a pin 50, carried at one end of a reciprocating bar 51, mounted in and freely sliding in a casing or bearing 52, secured along the under surface of the cover-plate 10. The free end 53 of the reciprocating bar is tapering or conical, being adapted to enter the space between any two consecutive alining pairs of teeth formed in the plates 32, the said spaces being radially in line with the centers of the punch-characters—that is, with the centers of the caps 39 surmounting the same. When, therefore, the horizontally-swinging index-lever 18 is swung so as to bring the index 24 opposite any character 25, the punch of that character carried by the arm 35 will be approximately in the line of action of the plunger 46, and when the latter is depressed by pulling down on the operating-lever 45 the short arm of the operating-lever by reason of its connection with the reciprocating bar 51 will force the free end 53 of said bar between the teeth of the plates 32, thus retaining or locking the die-plate and punches cooperating therewith firmly in position and obviating any tendency on the part of said die-plate to shift during the punching operation and insuring that the center of each button (corresponding with the center of each punch-character) is brought directly in the line of action of the vertically-reciprocating plunger 46, and thus further insuring the forcing of the punches squarely into their respective dies and without any lateral binding.

The parts are so proportioned that at the time the punch is entering a die to cut the stencil from the sheet of paper fed under the stripper-plate the end of the tapering portion 53 of the reciprocating bar 51 has about reached the base of the opening or space between the pair of teeth it enters. The reciprocating bar 51, together with the toothed plates 32, cooperating therewith, I here denominate as the "retaining and centering mechanism" for the die-plate, preventing, as it does, the die-plate from shifting during the punching operation and centering said die-plate properly to bring the center of each button or center of the punch-character in direct line of vertical action of the plunger 46.

Secured to the front vertical wall of the forked rib carrying the operating-lever is the vertical member 57 of the horizontal stripper-plate 58, the latter being expanded considerably, as seen best in Fig. 11, said stripper-plate being of course interposed between the series of rotating punches and dies and having a suitable opening 59 (see Fig. 4) to allow for the free passage of the punches into their respective dies, the purpose of the stripper-plate being to strip the paper from the punch as the latter is resuming its normal position after the punching operation has been completed.

The feed mechanism of the present machine may be described as follows: Carried adjacent to the pivotal point 44 of the operating-lever 45 and on the short arm of said lever is a laterally-projecting pin 60, which operates in and projects a suitable distance beyond the wall of the curved slot 61, formed in one of the forked members of the rib carrying the operating-lever. This pin 60 is adapted to cooperate with the lower engaging end or toe 62 of a lifting arm 63, pivoted loosely from the outer projecting end of the pin 44. As shown in Fig. 4, the free end of the arm 63 is held in an elevated position by reason of the pin 60 occupying the position it does when the operating-lever is in a vertical or normal position. When the operating-lever is depressed, the pin 60 sweeps along the curved slot 61 away from the engaging toe 62 of the said lifting arm, allowing the latter to drop by gravity, only to be again lifted when the operating-lever assumes its vertical position. As the arm is being lifted it engages with the under surface or engaging end 64 of a finger 65, pivoted along the outer surface of the vertical member of the stripper-plate, the pivotal bolt or pin 66 passing through said vertical member and into the front wall of the rib 9, carrying the same. Adjacent the engaging end of the arm 65 is pivoted a depending pawl 67, controlled by a spring 68, having one end secured to the pawl and the opposite end to the vertical member of the stripper-plate. The spring 68 keeps the pawl in engagement with the teeth of the ratchet-disk 69, secured centrally along the inner surface of the main feed-disk 70, (see Figs. 9 and 10,)

so that each time the arm 65 is raised by the action of the lever 45 the feed-disk will be advanced the angular distance corresponding to the advance of one tooth of the ratchet-disk, this space corresponding to the distance between any two consecutive characters to be stenciled on the paper.

The feed-ratchet and its disk are mounted on and are free to rotate about the pivotal pin 71, carried at the end of the short arm of a spring-actuated arm 72, pivoted to the front wall, to which the vertical member of the stripper-plate is secured, the end carrying the feed-disk being kept normally in a depressed position (to insure the necessary pressure by the disk against the paper fed under it, and thus insuring a positive feed) by the deflected end 73 of the arm 74, forming part of a resilient spring 75, coiled about a pin 76, projecting from a lug 77, which is carried by the side of the rib in which the operating-lever is mounted, the inner end of the spring bearing against and being secured to the lug. Coöperating with the feed-disk is a roller 78, mounted from a lug 79 at the bottom of the operating-table, the periphery of the roller passing through a suitable opening in the table, as seen in Fig. 9. To insert the paper to be stenciled, the free end of the arm 72 is depressed by the operator, raising the feed-disk sufficiently to admit of the paper being passed under it and between it and the roller 78. The outer end of the pivotal pin 71 carries a collar 80, (see Fig. 12,) limiting the outward movement of the feed-disk, from which collar extends a screw-threaded end 81, having a smooth portion about which is free to be passed the roller-bracket, whose oppositely-extending arms 82 carry at their free ends the rollers 83, coöperating with rollers 84, secured similarly to the roller 78. The roller-bracket has a medial upwardly-projecting shoulder 85, provided with a vertically-elongated slot 86, embracing the smooth portion of the screw-threaded end 81 of the pin 71, the whole being clamped against the collar 80 by a terminal nut 87. (See Fig. 12.) The roller-bracket assists the main feed-disk in feeding or advancing the paper placed under it. The object of having the slot 86 vertically elongated is to permit the roller-bracket to be adjusted and raised entirely off the operating-table when occasion arises to dispense with the bracket-rollers for feed purposes, as it does arise when circular paper is fed or the stenciling is cut in the arc of a circle, when only the main feed-disk is used, as subsequently explained.

To accommodate the variable widths of sheets of paper and at the same time guide the same while being fed under the punches, I provide an adjustable transverse guide-bar 88, the said bar being adjustable along the bed-plate or operating-table in a slot 89, along which the bar is shifted, the bar being held within the slot by the resilient expanding action of the members of the fork 90, form-

ing a part of the bar. A knob 91 is provided, by which the parts can be grasped by the operator. When the paper is to be fed in the arc of a circle—that is to say, when the stencil-address is to be punched along a curved line—the form of guide shown in Fig. 3 is to be substituted, being composed of a similar forked sliding part 90', but having a pin or spindle 92 in the place of the bar 88, over which the paper is passed, the pin or spindle serving as a pivot about which the paper is made to revolve by the feeding action of the main feed-disk 70, the roller-bracket under these circumstances being raised entirely out of contact with the rollers 84 in the manner above referred to.

To take up any undue strain imparted to the die-plate as an incident to the punching operation, I provide an adjustable strain-distributing supporting-bolt 93 for the under surface of the die-plate, adjacent to the periphery thereof, the bolt being passed through any convenient portion of the frame of the machine. Normally the supporting end of this bolt does not interfere with the free rotation of the die-plate; but as the latter will always yield more or less under pressure or during the punching operation it comes in contact with or is supported on the upper projecting end of the bolt referred to.

From the foregoing description the operation of the machine is obvious. Suffice it to say, however, that the index-lever 18 is swung into position, so as to bring any character opposite the plunger 46, when upon depression of the same by the operating-lever the reciprocating bar 51 will thoroughly and rigidly hold and center the die-plate and parts carried thereby, holding the same steady during the punching operation, the feeding of the paper taking place upon each upward stroke of the operating-lever 45.

Having described my invention, what I claim is—

1. In a stencil-cutting machine, a suitable frame, a rotating spindle, adjustable terminal bearings for said spindle, a rotating die-plate and a series of corresponding punches carried by the spindle, a plunger for said punches, an adjustable strain-distributing bolt for the die-plate carried by the frame, and means for rotating the die-plate, substantially as set forth.

2. In a stencil-cutting machine, an operating-lever, a lifting arm controlled by the same, a finger coöperating with the free end of the lifting arm, a spring-controlled pawl depending from the finger, and a feed-ratchet adapted to be seized by said pawl upon operation of the lever, substantially as set forth.

3. In a stencil-cutting machine, a suitable frame, an operating-lever pivoted in said frame, a curved slot formed in the frame adjacent to the short arm of the lever, a laterally-projecting pin carried by the short arm and projecting through the slot, a lifting arm pivoted adjacent to the operating-lever, a toe forming a part of the lifting arm and adapted

to engage with the projecting end of the pin carried by the short arm of the operating-lever, a suitable feed-disk, and intermediate connections between the feed-disk and the
5 lifting arm for advancing the feed-disk with each stroke of the operating-lever in one direction, substantially as set forth.

4. In a stencil-cutting machine, a rotating die-plate having a central raised portion or
10 ridge, a conical block resting on said ridge, a series of spring-arms secured radially to the conical surface of said block, a central raised portion for said conical block, a toothed plate mounted on said raised portion, a second
15 toothed plate superposed over the first toothed plate and separated a slight distance by an intermediate disk, said parts being all secured together by bolts and moving as a unit upon the rotation of the die-plate, substan-
20 tially as set forth.

5. In a stencil-cutting machine, a suitable arm, a pin carried at one end of the same, a

feed-disk passed over the pin, a ratchet centrally secured to the feed-disk, a shoulder on said pin for limiting the position of the disk
25 on the same, a screw-threaded extension projecting from the shoulder, said screw-threaded extension having a smooth portion, a bracket having an elongated slot by which it is passed over the smooth portion of the screw-threaded
30 extension, rollers at the free ends of the said bracket, and a securing-nut passed over the exposed portion of the screw-threaded extension whereby the roller-bracket is made vertically adjustable and can be raised entirely
35 off the operating-table while the main feed-disk remains in contact with it, substantially as set forth.

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

STEPHEN D. HARTOG, JR.

Witnesses:

E. STAREK,

ALFRED A. MATHEY.