

(No Model.)

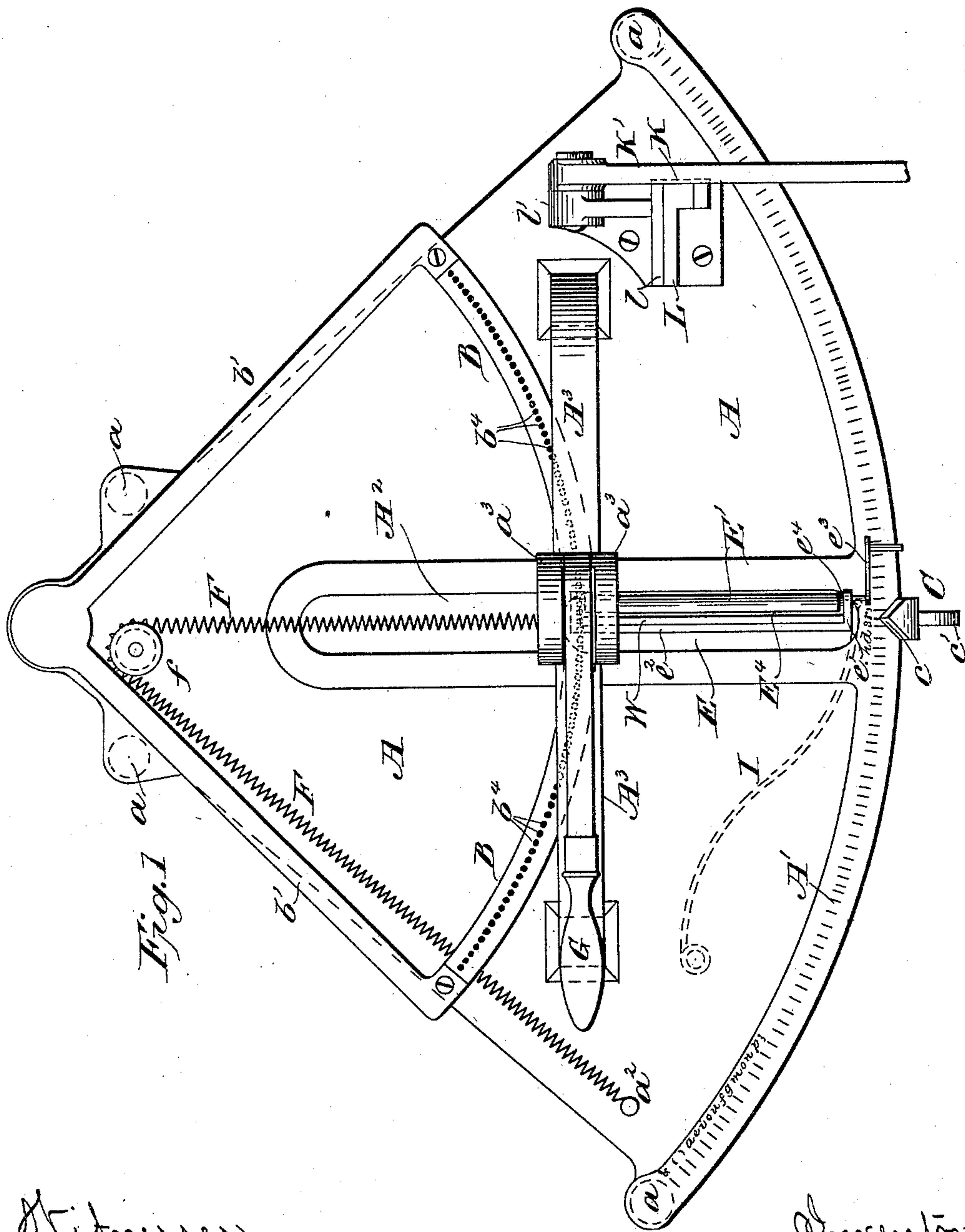
4 Sheets—Sheet 1.

A. J. ENGELEN

MACHINE FOR MAKING TYPE BARS.

No. 413,042.

Patented Oct. 15, 1889.



Witnesses
C. M. Hallahan
A. N. Weaver

Antoine J. Engelen
for Inventor
Atty

(No Model.)

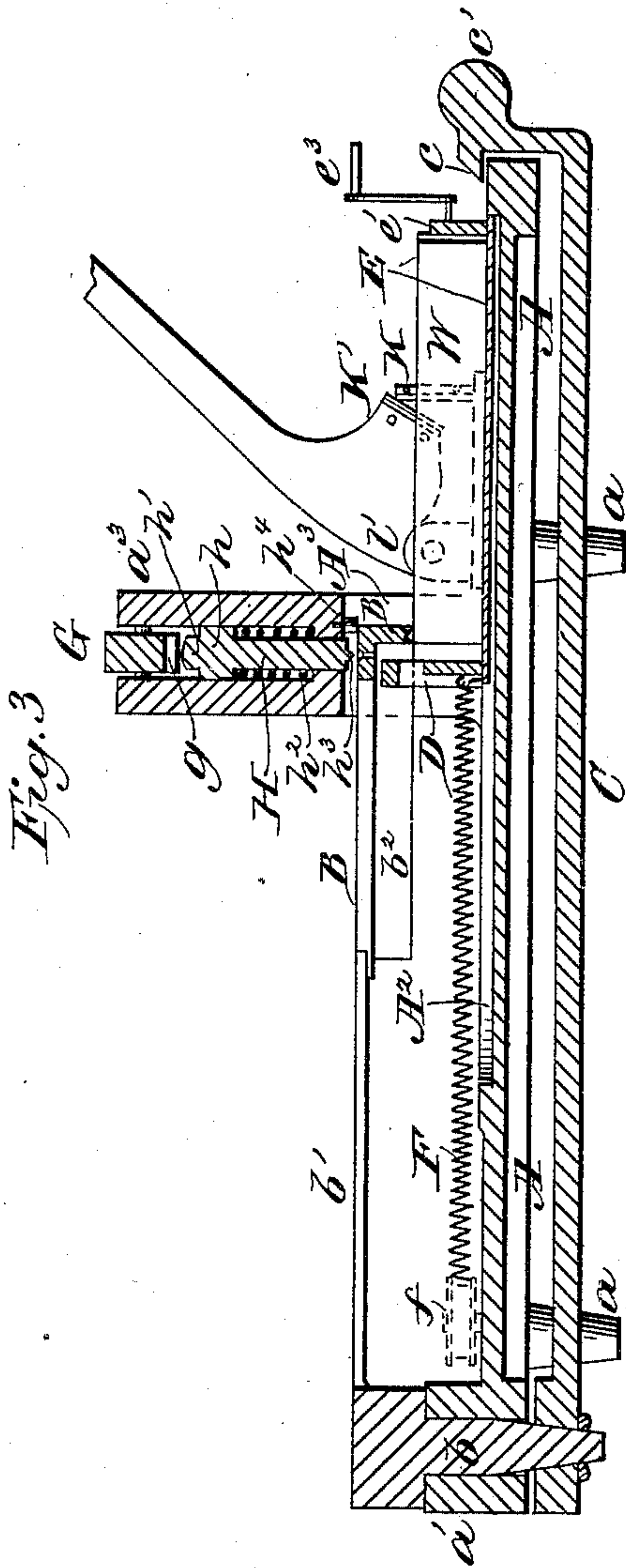
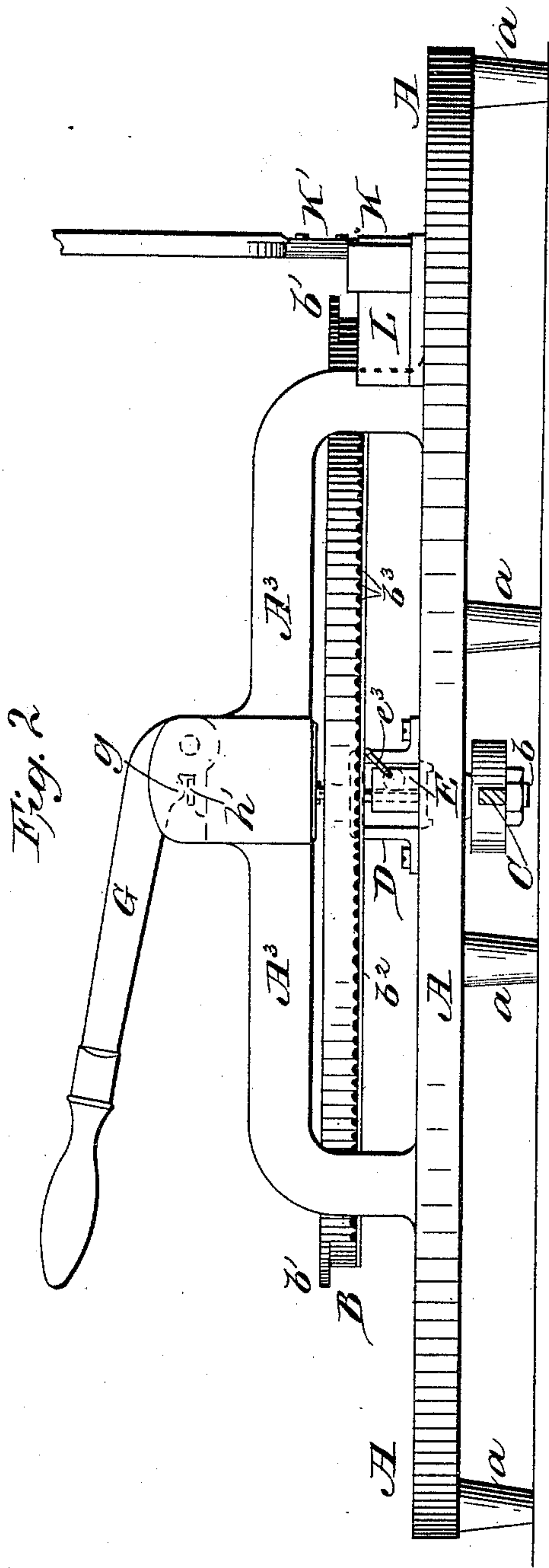
4 Sheets—Sheet 2.

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Witnesses
C. M. Gallahue
A. W. Weaver.

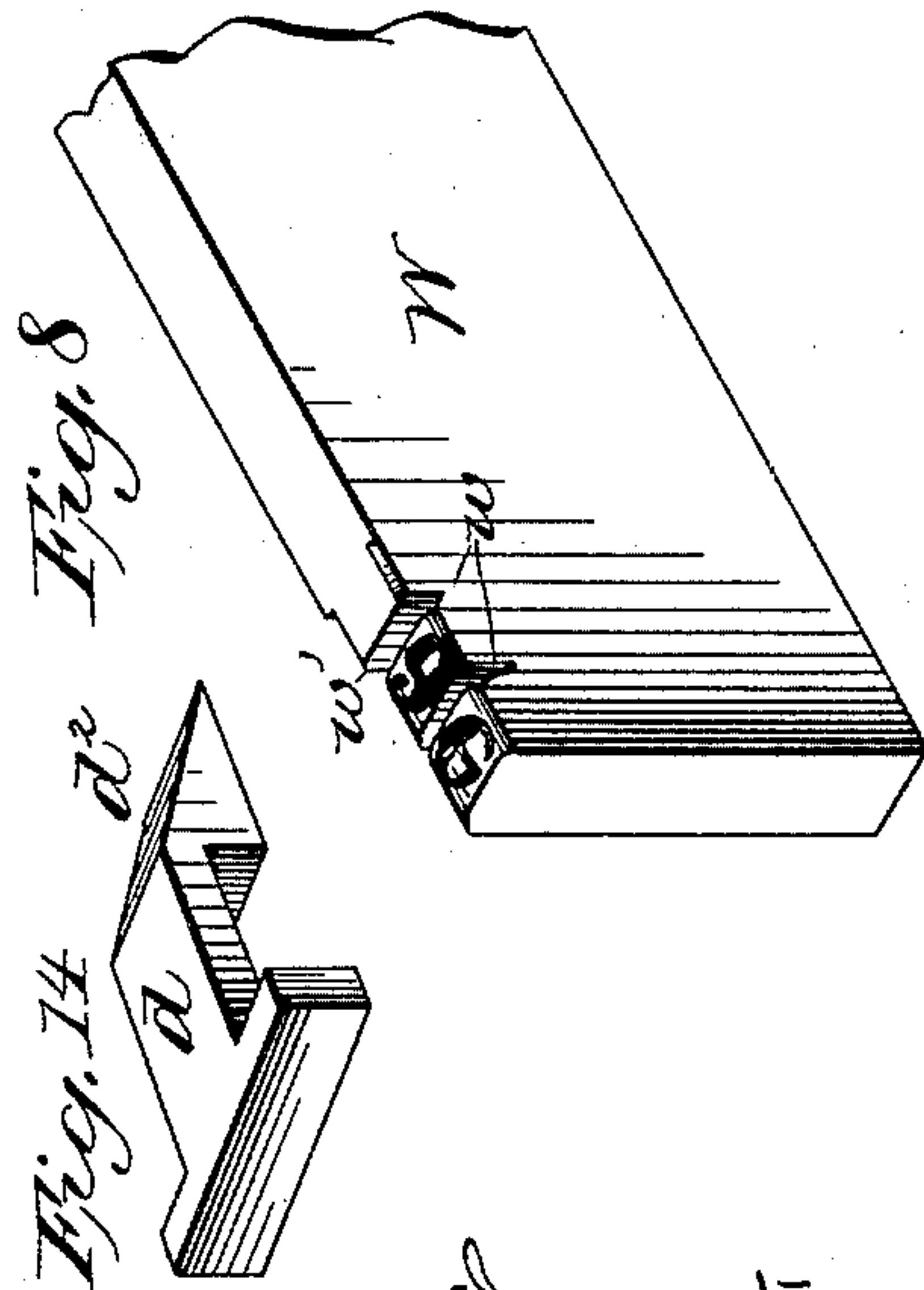
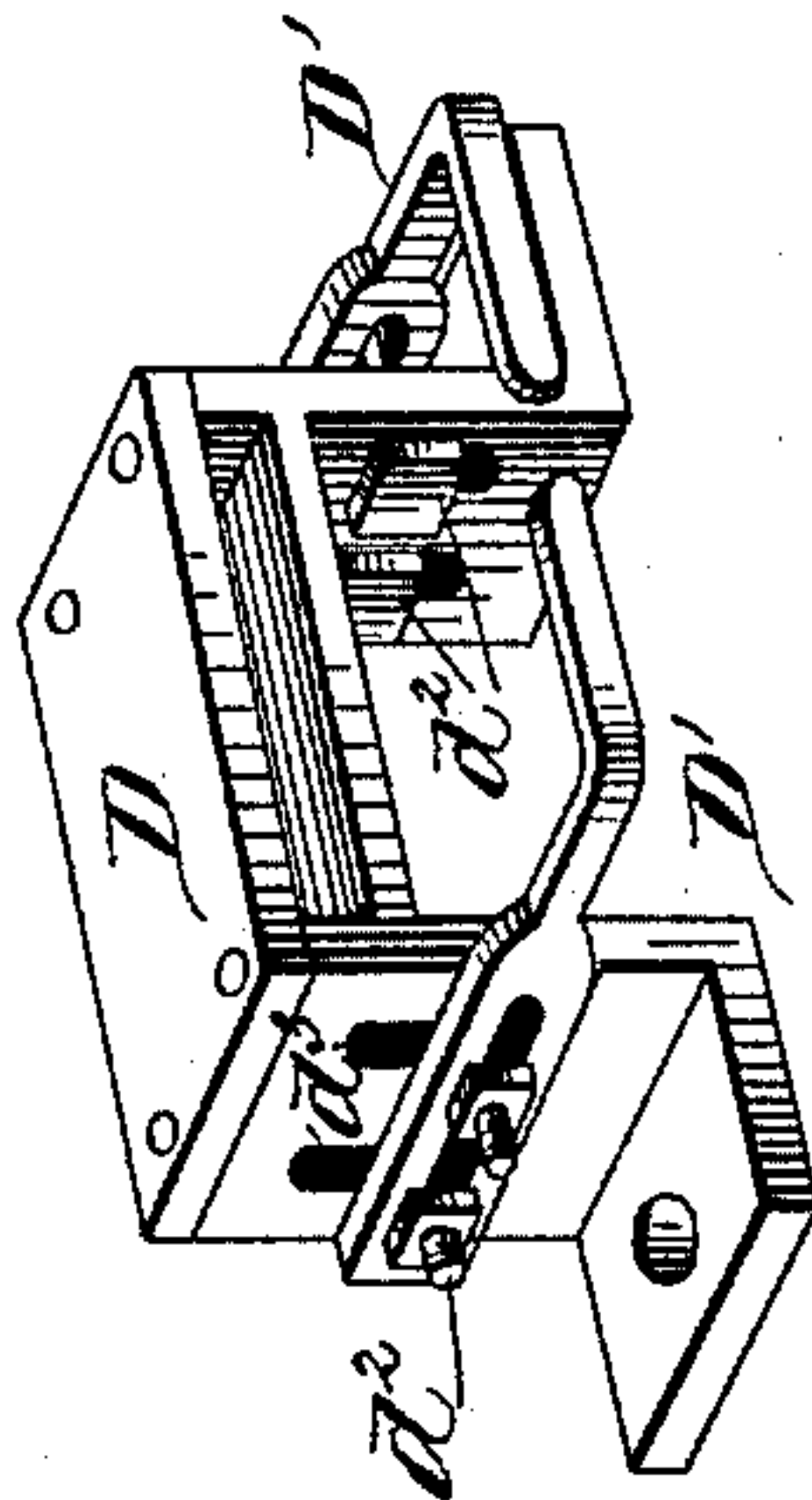
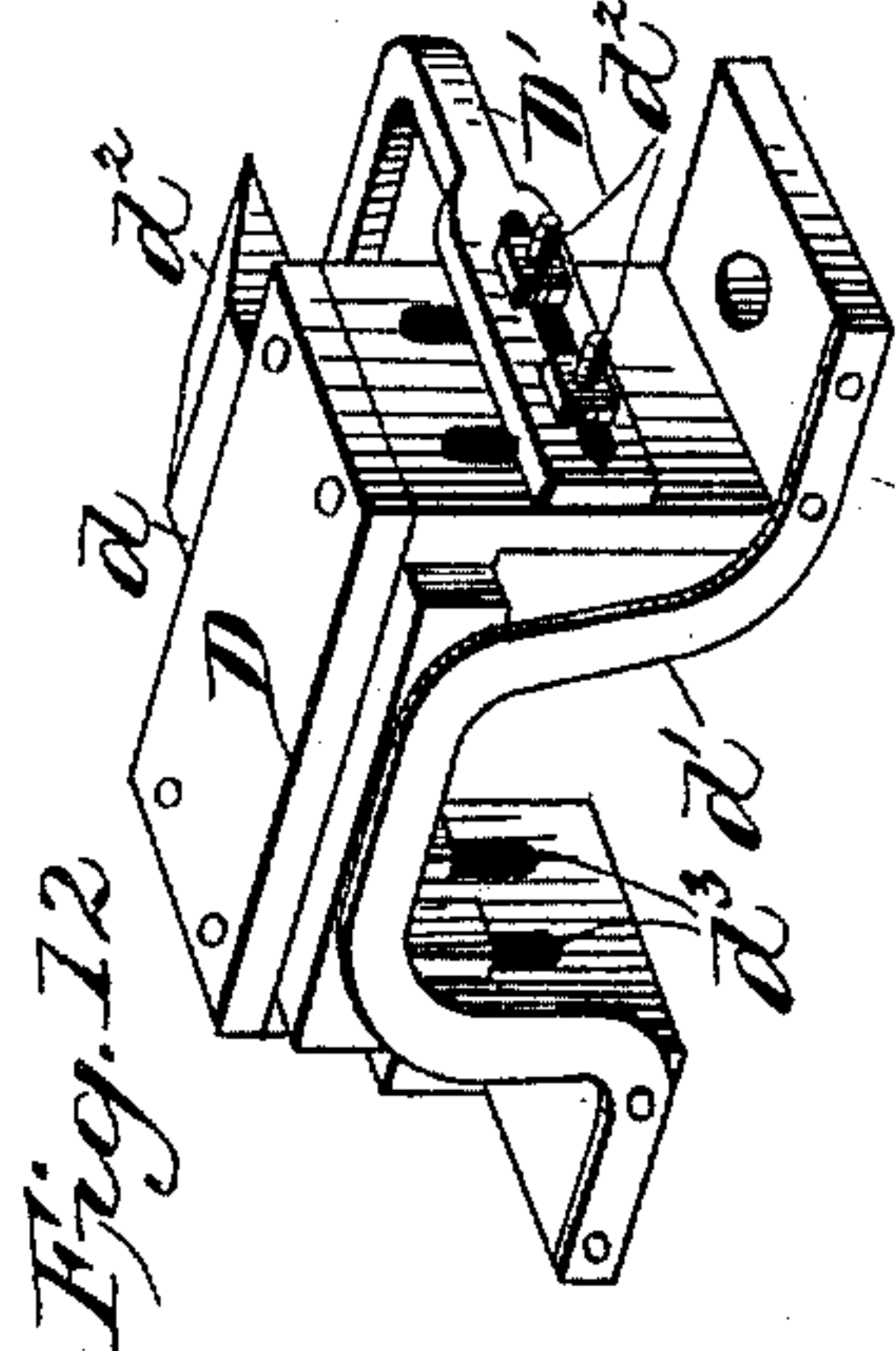
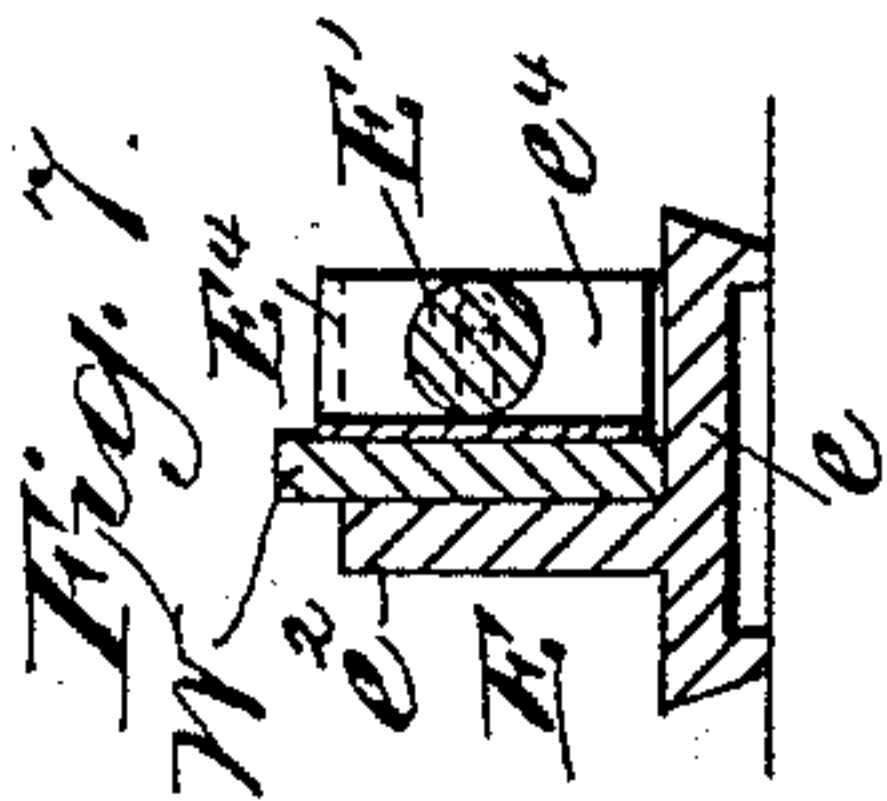
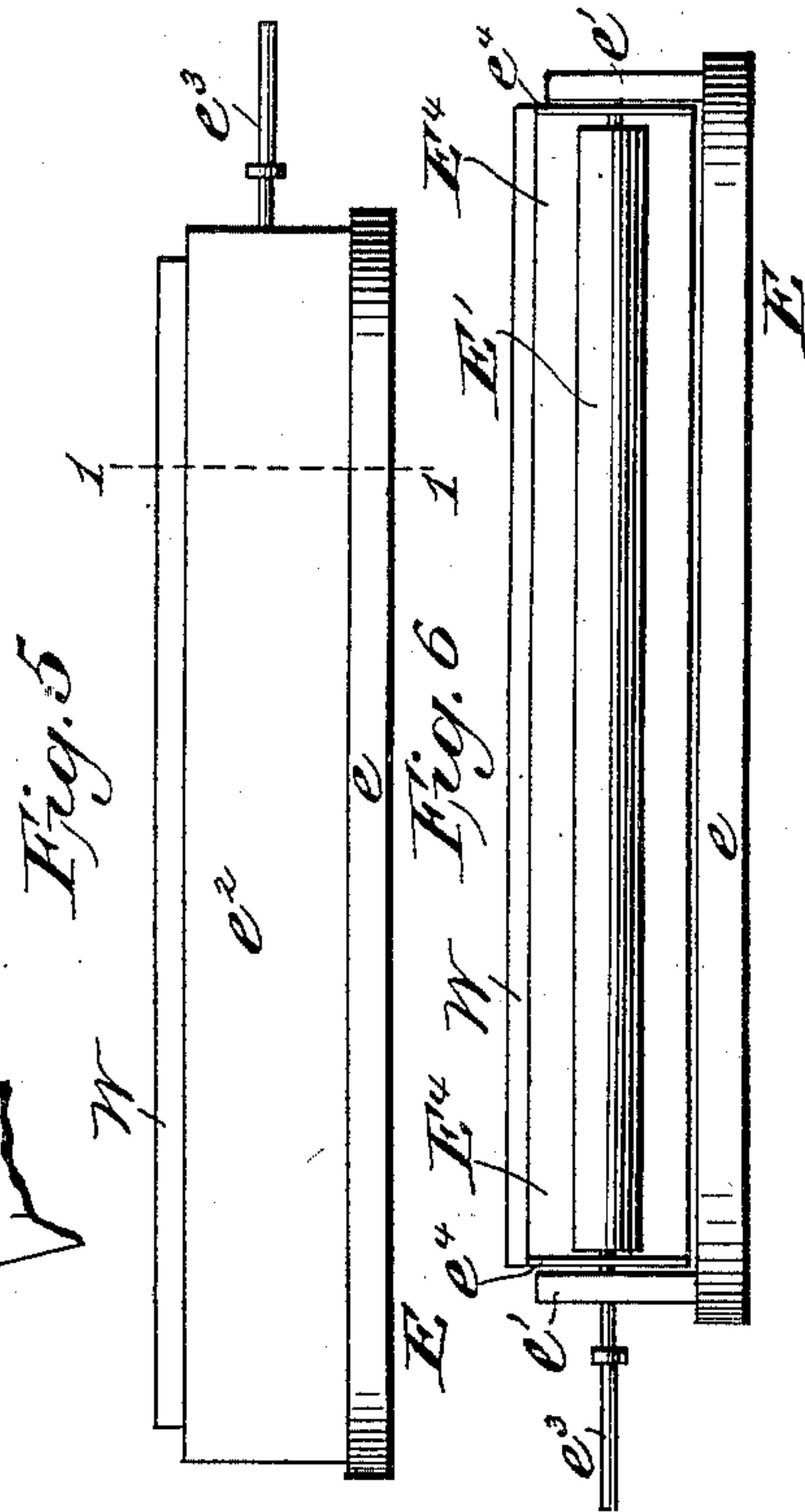
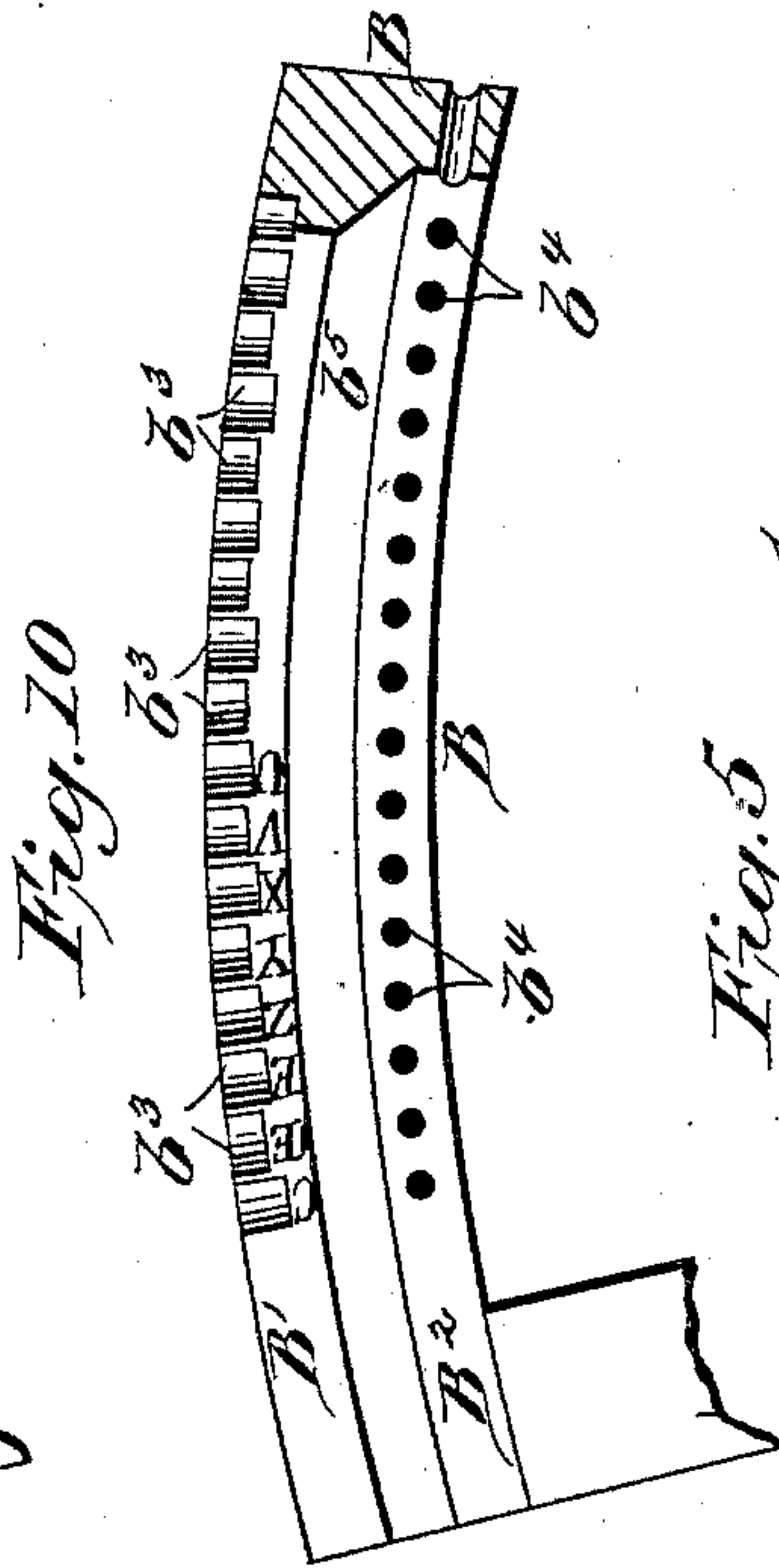
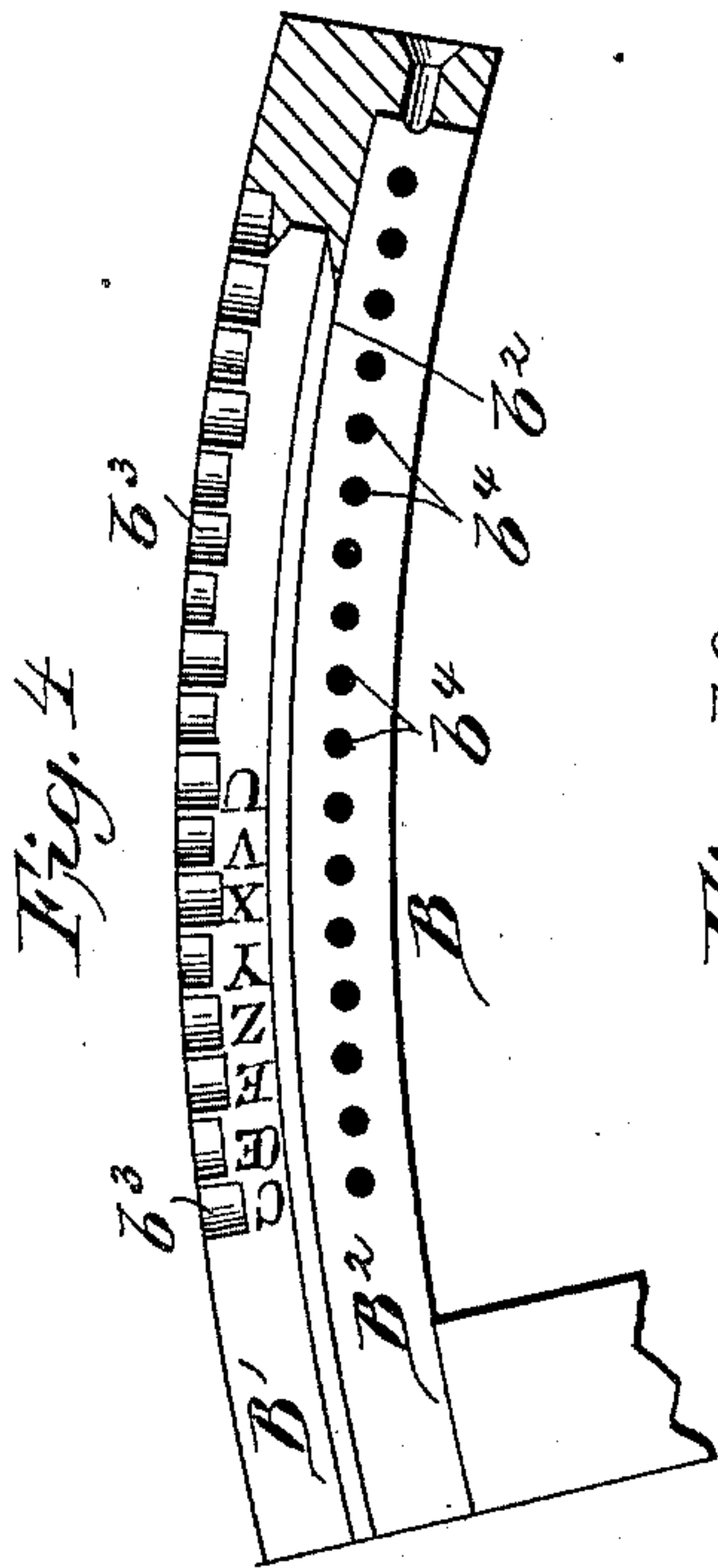
Inventor,
Antoine J. Engelen
per *[Signature]* Atty

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Witnesses
C. H. Gallahan
A. W. Weaver

Inventor
Antoine J. Engelen
per Henry M. M.
Atty.

(No Model.)

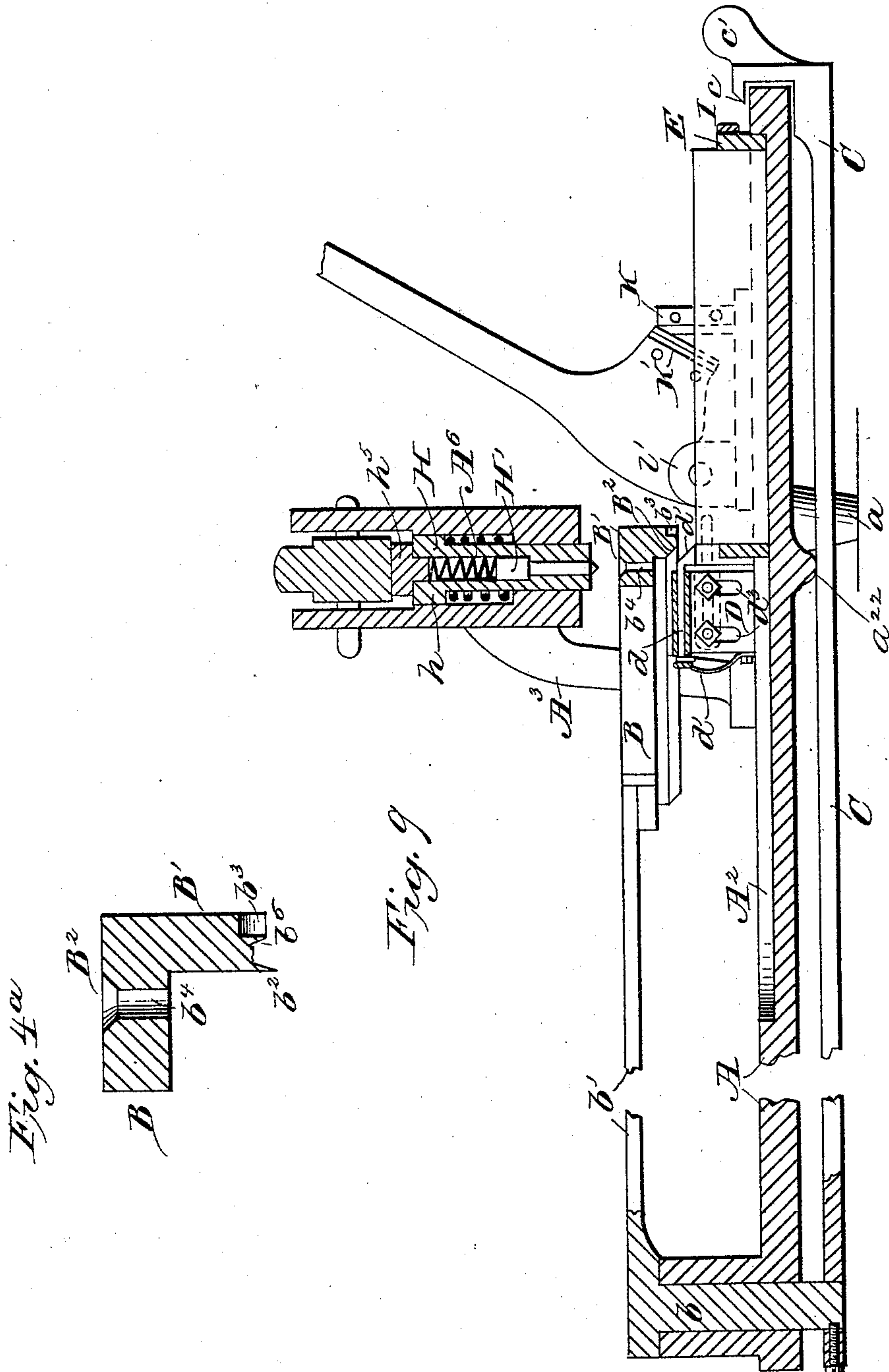
4 Sheets—Sheet 4.

A. J. ENGELEN

MACHINE FOR MAKING TYPE BARS.

No. 413,042.

Patented Oct. 15, 1889.



Witnesses
C. M. Hallahan
A. V. Kover

Inventor
Antoine J. Engelen
per *[Signature]* Atty

UNITED STATES PATENT OFFICE.

ANTOINE JOSEPH ENGELN, OF BRUSSELS, BELGIUM, ASSIGNOR TO ANTOINE MULLERS, OF EHRENFELD, COLOGNE, AND GUSTAVE MAACKS, OF COLOGNE, GERMANY.

MACHINE FOR MAKING TYPE-BARS.

SPECIFICATION forming part of Letters Patent No. 413,042, dated October 15, 1889.

Application filed March 20, 1888. Serial No. 267,892. (No model.) Patented in Belgium July 11, 1884, No. 65,744; in England August 2, 1884, No. 10,901; in France January 9, 1885, No. 166,347, and in Germany June 16, 1885, No. 34,214.

To all whom it may concern:

Be it known that I, ANTOINE JOSEPH ENGELN, a citizen of the Kingdom of Belgium, residing at Brussels, in Belgium, have invented
5 certain new and useful Improvements in Machines for Making Type-Bars, (for which I have obtained Letters Patent in England dated August 2, 1884, No. 10,901; in Belgium dated July 11, 1884, No. 65,744; in France
10 dated January 9, 1885, No. 166,347, and in Germany dated June 16, 1885, No. 34,214;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art
15 to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

20 Referring to the drawings, Figure 1 is a top plan view of a machine embodying my invention. Fig. 2 is a front elevation, and Fig. 3 a vertical central section, of the same. Fig. 4 is an under side view of a portion of the matrix-plate. Fig. 4^a is a transverse section of the same on an enlarged scale. Figs. 5 and
25 6 are opposite side elevations of the carriage for the blanks. Fig. 7 is a section taken on line 1 1 of Fig. 5. Fig. 8 is an isometric view of a portion of a blank; Fig. 9, a vertical central section of a machine embodying my invention and showing certain modifications in construction. Fig. 10 is an under side view of a portion of the matrix thereof on an enlarged scale. Fig. 11 is a transverse section
30 of the carriage; and Figs. 12, 13, and 14 are isometric detail views of parts of the machine shown in Fig. 9.

The invention relates to that class of machines by means of which impressions in relief are produced upon more or less plastic or compressible materials, or by which intaglio impressions may be produced in such materials.

Any suitable material may be employed in
45 the production of the type-bars, and, although I prefer to employ wood with a view to cheapening the production of such bars, I do not desire to limit myself to this material, as any

other material capable of receiving an impression from a harder material than itself
50 may be employed, and for the purposes of description I will hereinafter refer to wooden strips or bars only.

In the drawings, A indicates a table from which the operating mechanism is supported.
55 It is by preference made in the form of a sector and provided with suitable legs *a*. At the center of the circle from which the arc of the sector is drawn the table A has a bearing *a'* for the pivot-pin of the matrix B. Upon
60 its upper face and along the edge of the arc of the sector the table is provided with an index A', containing all the characters the machine is capable of producing, said characters being arranged consecutively or in a single
65 row. In the upper face of the table, on the axial line thereof, is formed a guide groove or way A² for the carriage that supports the strip of wood that is to receive the impressions, and from said table rises a suitable
70 yoke or standard A³ for the matrix-operating devices.

B indicates the matrix, which, like the table A, has the form of a sector, the arc being connected to a pivot *b*, whose axis is the center of the circle, from which the arc is drawn
75 by means of radial arms *b'* of sufficient elasticity to return the matrix automatically into its normal position when moved out of it in the act of making an impression. The matrix-plate, as shown in Figs. 4 and 4^a, has substantially the form of a right angle or that of a letter L, and has along the inner edge of the under face of the vertical portion B' a beveled cutting-edge *b*², that projects beyond
80 the intaglio characters immediately in front of said projecting cutting-edge *b*². The characters correspond with those of the index A' on the edge of the table and are similarly arranged, but in reverse order, and in front of
85 each character is formed a concave recess *b*³, for purposes presently explained. In the horizontal portion B³ of the matrix are formed perforations or sockets *b*⁴, the upper end of which is reamed out or enlarged for the reception of the plunger pin or cone. The char-
90 95

acters along the edge of the table, those in the matrix, the concave recesses in front of the characters in the said matrix, and the perforations are all arranged on radial lines drawn from the center of the pivot b to the periphery of the arc of the table A, the arc of the matrix being a segment of a circle having the same center as but of less diameter than the circle of which the outer edge of the table A is a segment. The pivot-pin b of the matrix B projects below the table A and carries a lever C, whose outer end is of rectangular form and embraces the curvilinear edge of the table. That portion of the lever which projects onto the upper face of the table is fashioned into a pointer c , and from the said rectangular portion of the lever C projects a thumb-piece or handle c' . It is obvious that when the lever C is moved to any one of the characters of the index A' the matrix will be correspondingly moved and the corresponding character therein will be brought to a fixed point in the plane of the axial line of the table A, since the said lever is connected with the matrix B so as to lie in the axial line thereof. At a point in rear of the vertical portion B' of the matrix B, and straddling the guide-groove A², is secured a bridge D, that limits the downward movements of the matrix, and consequently the depth of the impressions made thereby. In the said guide-groove is fitted a carriage E, (shown in detail, Figs. 5, 6, and 7,) composed of a bed-plate e , whose sides are beveled and fit the lateral walls of the guideway A². From the bed-plate project the end walls e' and a side wall e^2 , all of less height than the height of the type-bar. In the end walls e' are formed bearings for the journals of an eccentric-roller E', one of which journals carries a crank e^3 for operating the roller.

E⁴ is a retaining-plate of rectangular form, in the ends e^4 of which are formed horizontal slots, through which the journals of the eccentric-roller E' pass. If the strip of wood is inserted between the plate E⁴ and the lateral wall e^2 of the carriage and the roller E properly operated, the said strip will be securely clamped to the carriage, as will be readily understood. To the rear end of the carriage is secured one end of a coiled spring F, said spring passing around a sheave or guide-pulley f , journaled to the table A, so that the spring will lie in the axial line thereof, the other end of said spring being secured to a stud a^2 on the table A. In the upper end of the standard A³ of the table A is fulcrumed a hand-lever G, that has a projection or lip g , and in said standard is formed a bearing a^3 for a plunger H, that has an enlarged head h and a projection h' . A spring h^2 is coiled around the plunger to return it into its normal position when moved out of it by the hand-lever. On the lower face of the plunger H is formed a cone-stud h^3 , that fits into the upper conical portion of the perforations or recesses or sockets b^4 in the matrix B. From

the under side of the bearing projects a screw h^4 , that serves to limit the upward motion of the matrix B.

The operation of the machine is as follows: A strip of wood W is secured to carriage E so that its inner upper edge will abut against the inner face of the projecting cutting-edge b^2 of the matrix B, and the latter is then positioned to bring the desired character over the strip. The lever G is now operated to depress the plunger, the projection g of said lever bearing on the head h of the plunger, whose cone-stud h^3 enters the recess or perforation b^4 in rear of the character to prevent lateral displacement of the matrix B and force the matrix down until its motion is arrested by the bridge D, a character in relief being formed in the upper face of the strip of wood. I have stated above that in front of each character of the matrix is formed a concave recess b^3 , the depth of which is equal to or slightly greater than the extent to which the wood is compressed in making the impression, so as not to act upon the upper face of the strip and compress the same. The rear vertical wall b^6 of the recesses b^3 is also a cutting-edge, as shown in Fig. 4^a, its face toward the character-space being inclined or beveled the same as the like face of the cutting-edge b^2 in rear of the character-space. It is obvious that when the character-space of the matrix is forced into the upper face of the strip of wood there will be a V-shaped notch w formed between each two characters, while a vertical shoulder w' is formed in front of each character as it is impressed. An abutment is thus formed that will come in contact with the projecting cutting-edge b^2 when the matrix-plate has moved back into its normal position, that regulates the feed of the carriage, so that said carriage E cannot move a greater distance than a letter-space. By means of the cutting-edges b^5 b^2 on the matrix-plate each letter on the type bar or blank will stand in relief on a block-like projection, as shown in Fig. 8. On the other hand, if the type-bar is so held that the concave recess b^3 in front of the character to be first impressed will first impinge on the type-bar, the lateral edges thereof will be beveled off, as shown, this operation being necessary only for the first letter, since it is obvious that as each subsequent character is impressed the lateral edges in front of each character will be beveled by the recess b^3 .

The machine, in its details of construction, may be modified, some of these modifications being shown in Figs. 9 to 14. The carriage E may, for instance, be moved by a spring-arm I, as shown also in dotted lines in Fig. 1, one end of which is secured to a stud on the table and the other to the front of the carriage E. The carriage may have its bed-plate e grooved for the reception of the strip of wood, as shown in Fig. 11, and the lateral vertical wall, the eccentric-roller, and clamping-plate may be dispensed with, the strip of

wood being held against lateral displacement and properly guided by guide arms or fingers secured to the bridge, as hereinafter explained. The matrix B may be constructed, as shown in Fig. 10, to suit the feed-controlling devices. (Shown in Figs. 12, 13, and 14.) The matrix B has here also the form of a right angle, or that of a letter L; but the inner wall b^5 of the vertical portion B' is inclined or beveled, the cutting-edge b^2 being here dispensed with. In the bridge D is arranged a stop-plate d , that is held in its normal position by a bow-spring d' . On each side of the bridge is adjustably secured a guide-finger D' by means of bolts d^2 , passing through vertical slots d^3 in the lateral walls of the bridge. The guide-fingers extend to the opposite sides of the strip of wood to prevent lateral displacement thereof and guide it properly in its movement through the bridge. The mechanism for depressing the matrix may also be modified in its construction, as shown in Fig. 9. In the bearing a^3 may be fitted a hollow plunger H, in which latter is fitted a headed cone-pin H', that is held projected from the plunger by a coiled spring A⁶, confined within the hollow plunger A between the movable plug h^5 in the plunger-head h and the head of the cone-pin H', thus providing a yielding bearing for the cone-pin.

The operation of the modified machine is substantially the same as that of the machine first described and produces like results. It will be observed that as the hollow plunger is forced down the cone-pin will enter one of the perforations b^4 in the matrix in rear of the character to be impressed, the matrix will be forced down upon the strip of wood that is held against motion by the stop-plate d , and as the matrix sinks into the wood its beveled or inclined inner wall b^5 impinges upon the correspondingly-beveled face d^2 of the stop-plate and pushes it back against the stress of its spring d' . The matrix now holds the type-bar W against motion and depresses a portion of the upper face thereof in making the impression, thus forming in front of each character a shoulder w' , the concave recesses beveling the lateral edges of the type-bar in front of and along the next letter-space, so that as the matrix moves back into its normal position the stop-plate d moves to its normal position also; but since that portion of the type-bar on which the character has been impressed has been depressed the carriage is free to move forward until the shoulder w' comes in contact with the outer edge of the stop-plate. In this manner the strip of wood is fed forward a distance equal to the space occupied by the character previously impressed and no more. The strips of wood employed are of, or approximately of, the length of the line to be printed; but where justification is necessary, or for short lines, I provide means for cutting the strips. To the table A is secured a standard L, that carries a knife-

blade K, and said standard is constructed to form a rest or bearing l for the type-bar W. On the base or foot-plate of the standard is formed a bearing l' , in which is pivoted a knife K', provided with a suitable handle, by means of which and the stationary blade K the type-bars are cut when this becomes necessary in justifying.

I claim—

1. In a machine for producing characters in relief on a bar of compressible material, a matrix-plate having a plane face in which the characters are formed *in intaglio* and in which is formed a concave recess in front of each character, substantially as and for the purposes specified.

2. In a machine for producing characters in relief on a bar of compressible material, a matrix-plate having a plane face in which the characters are formed *in intaglio* and in which is formed a concave recess in front of each character extending from the character-space to the edge of the matrix-plate, said concave recess varying in length according to the width of the character-space, substantially as and for the purposes specified.

3. In a machine for producing characters in relief on a bar of compressible material, a matrix-plate having a plane face, in which the characters are formed *in intaglio* and in which is formed a concave recess in front of each character extending from the character-space to the edge of the matrix-plate, whereby when an impression is made a shoulder will be formed in front of each character by the depression of the latter below the face of the bar, in combination with a lever and connections to force the matrix-plate into the bar, feeding devices to automatically feed the bar forward, and a stop in the path of the bar adapted to engage the shoulder formed in front of each character to hold the bar against the action of the feeding devices, substantially as and for the purposes specified.

4. In a machine for producing characters in relief on a bar of impressible material, a matrix-plate having substantially the form of a right angle or L, having in the under face of its vertical portion a single row of characters *in intaglio*, a recess or depression in front of each character, and a cutting-edge on opposite sides of the character-space, one of said cutting-edges projecting beyond the face in which the characters are formed, for the purposes specified.

5. In a machine for producing type-bars, the combination of the following elements: a pivoted matrix-plate having the form of a segment of a circle, a vertical pivot therefor, elastic supporting-arms connecting the segment with its pivot, a lever for rotating the matrix-plate on its pivot, a power-lever, transmitting devices for transmitting the power exerted by the lever to the matrix-plate to depress the same against the stress of its supporting-arms, a stop to limit the downward movement of the matrix-plate, and a

stop to lock the matrix-plate against movement on its pivot controlled by the power-lever through the transmitting devices, substantially as described, for the purposes specified.

6. In a machine for producing type-bars, the combination of the following elements: a pivoted matrix-plate having the form of a segment of a circle, a vertical pivot therefor, elastic supporting-arms connecting the segment with its pivot, a lever for rotating the matrix-plate on its pivot, a power-lever, transmitting devices for transmitting the power exerted by the lever to the matrix-plate to depress the same against the stress of its supporting-arms, a stop to limit the downward movement on its pivot, and feeding devices, the operation whereof is controlled by the matrix, to feed the type-bar blank a step forward at each impression, substantially as and for the purposes specified.

7. In a machine for producing type-bars, the combination of the sector-shaped matrix-plate B, connected by elastic arms to a pivot or stud b , the sector-shaped platform A, to which said matrix-plate is pivoted, the pointer-lever C, and a power-lever and plunger for forcing the matrix-plate down toward its support, said parts being arranged for operation for the purposes specified.

8. The combination, substantially as herein described, of the table A, having a guide-groove A^2 along its median line, the matrix-plate B, pivotally connected with the table, as described, and having a projecting edge b^2 , and the spring-actuated carriage E, substantially as and for the purposes specified.

9. In a machine for producing type-bars, the

combination, with the table A, provided with a guide-groove A^2 along its axial line, the matrix-plate B, having a horizontal and vertical movement on the table and being provided on opposite sides of its character-space with projecting cutting-edges b^2 b^5 , respectively, and the spring-actuated carriage E, of the bridge D, said parts being arranged for operation for the purpose specified.

10. The combination, substantially as herein described, with the table A, the matrix-plate B, the carriage E, the spring F, and mechanism to depress the matrix-plate, of the bridge D and the guide-fingers D' , adjustable thereon, said parts being constructed and arranged for operation for the purposes specified.

11. The combination, with the table A, provided with the guide-groove A^2 , the matrix-plate B, and the bridge D, of the carriage E, having vertical end walls and a like side wall, and the eccentric-roller E' , journaled in said end walls, substantially as and for the purposes specified.

12. The combination, with the table A, having a guide-groove A^2 , the matrix-plate B, and bridge D, of the carriage E, having vertical end walls and a like side wall, the eccentric-roller E' , journaled in said end walls, and the laterally-movable clamping-plate E^4 , interposed between the roller and the side wall of the carriage, substantially as and for the purpose specified.

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

ANTOINE JOSEPH ENGELLEN.

Witnesses:

HERM. ROCLOT,
EDOUARD LABARGE.