

No. 771,160.

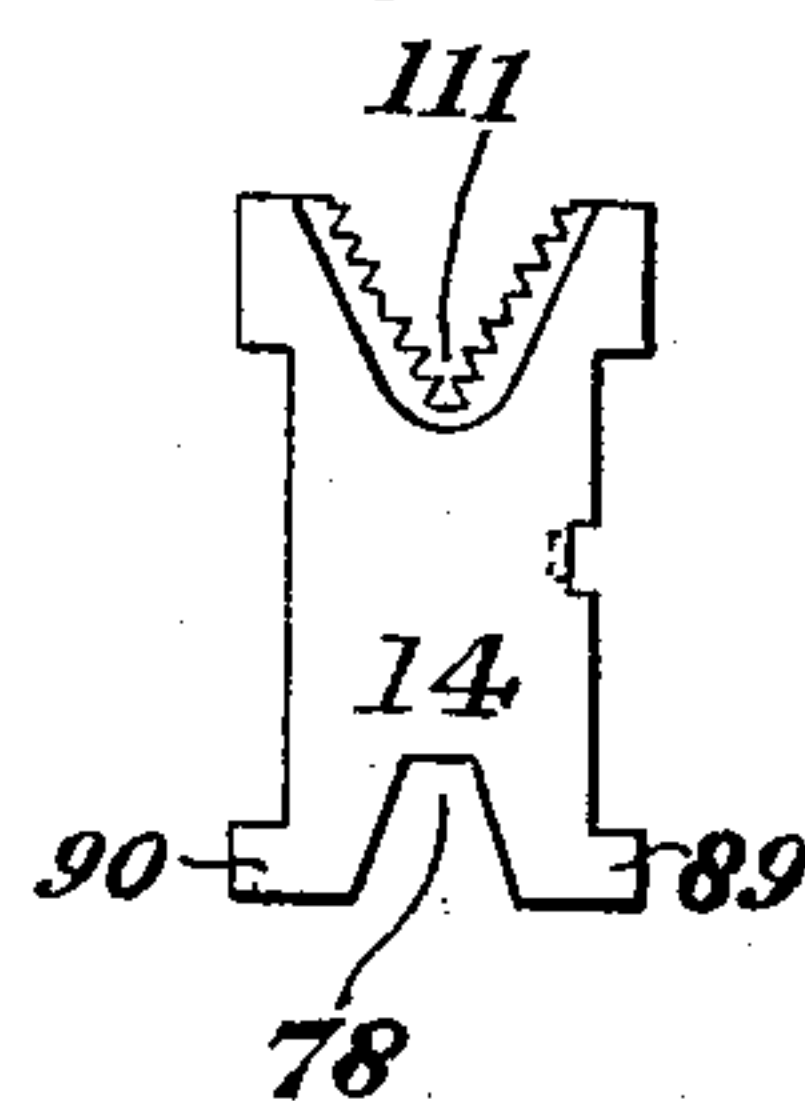
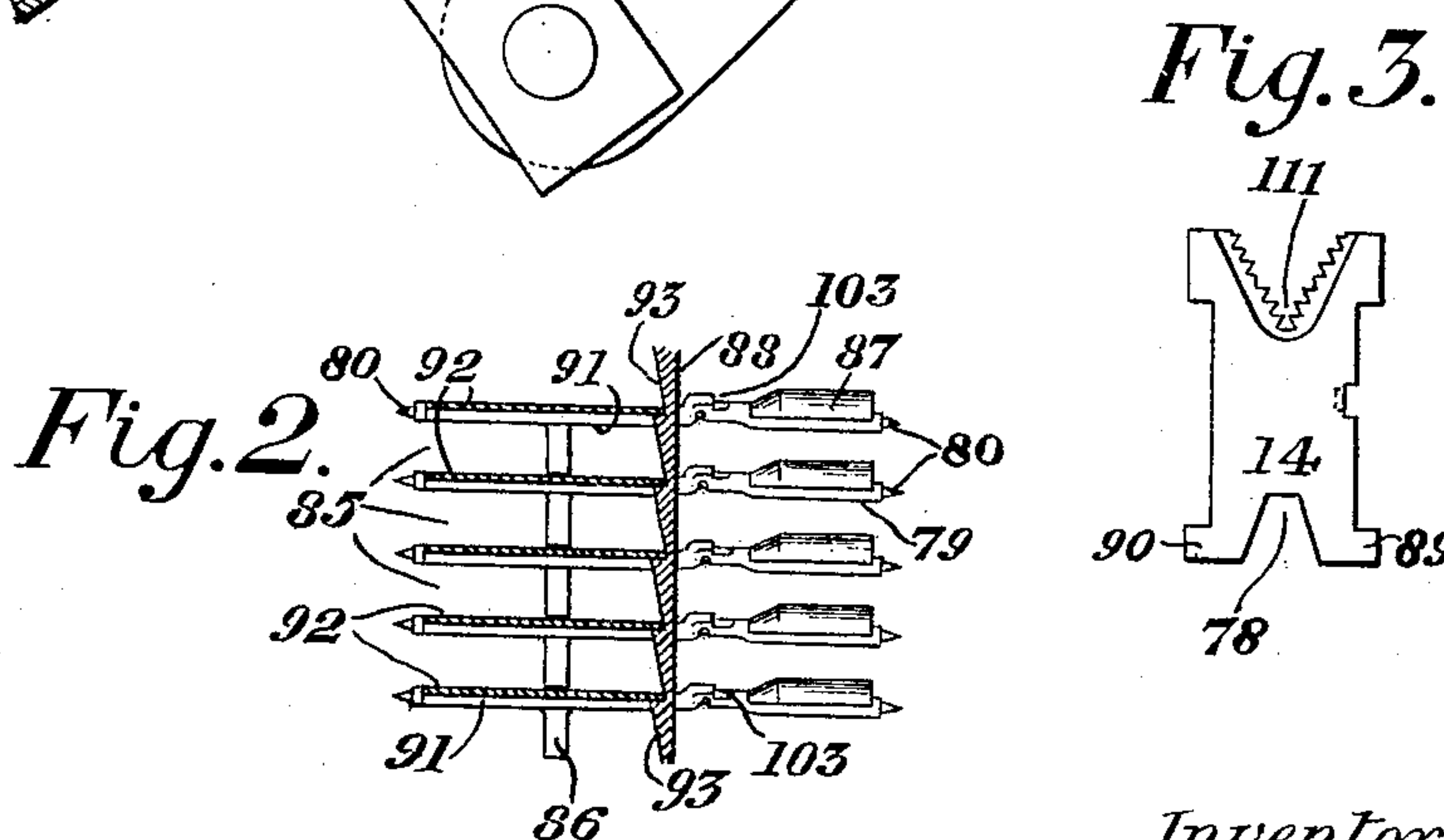
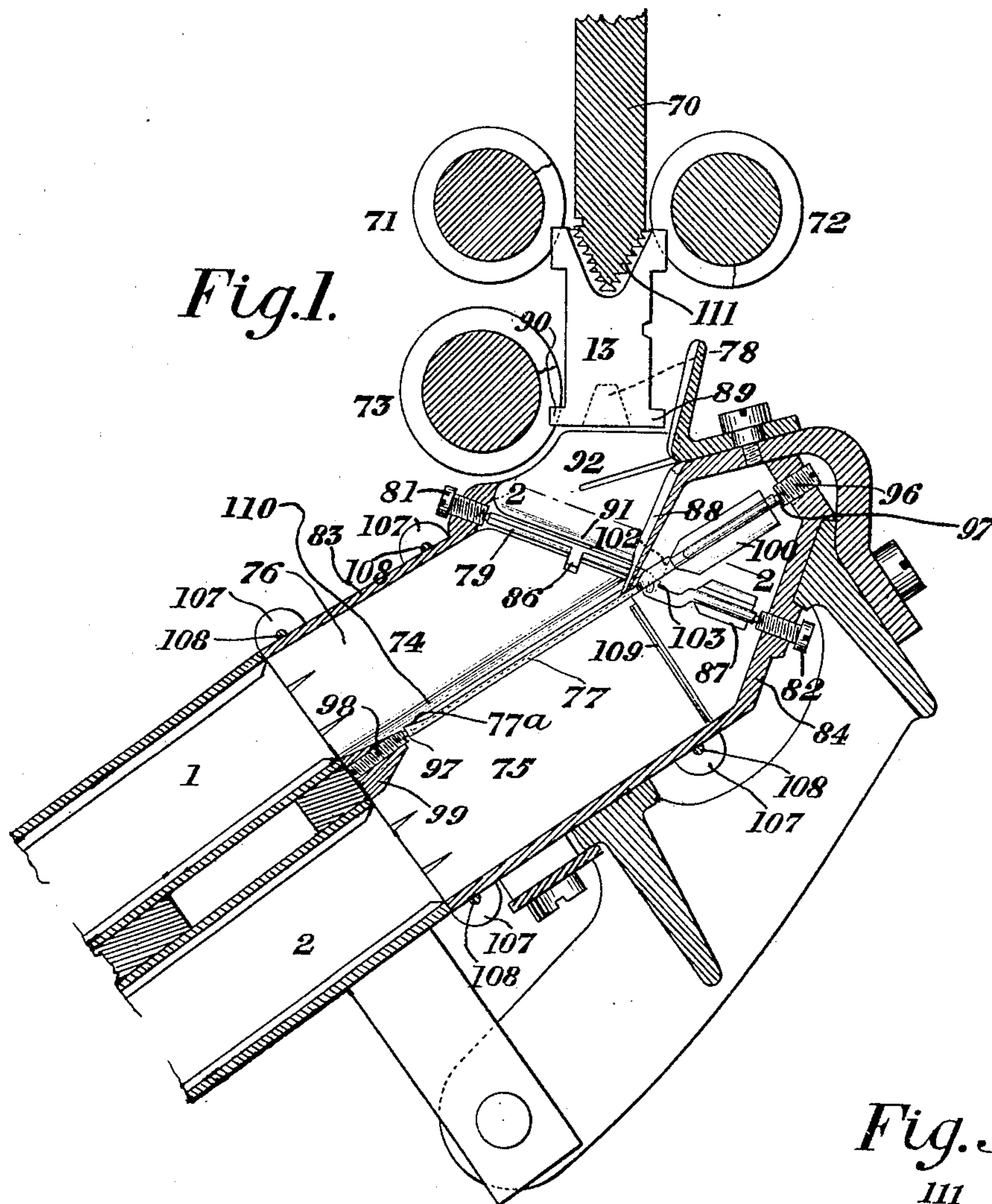
PATENTED SEPT. 27, 1904.

P. C. LAWLESS.  
MULTIPLE MAGAZINE LINOTYPE MACHINE.

APPLICATION FILED DEC. 21, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses  
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Warwick H. Williams.

Inventor  
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per *Frank Woodroffe*  
Attorney

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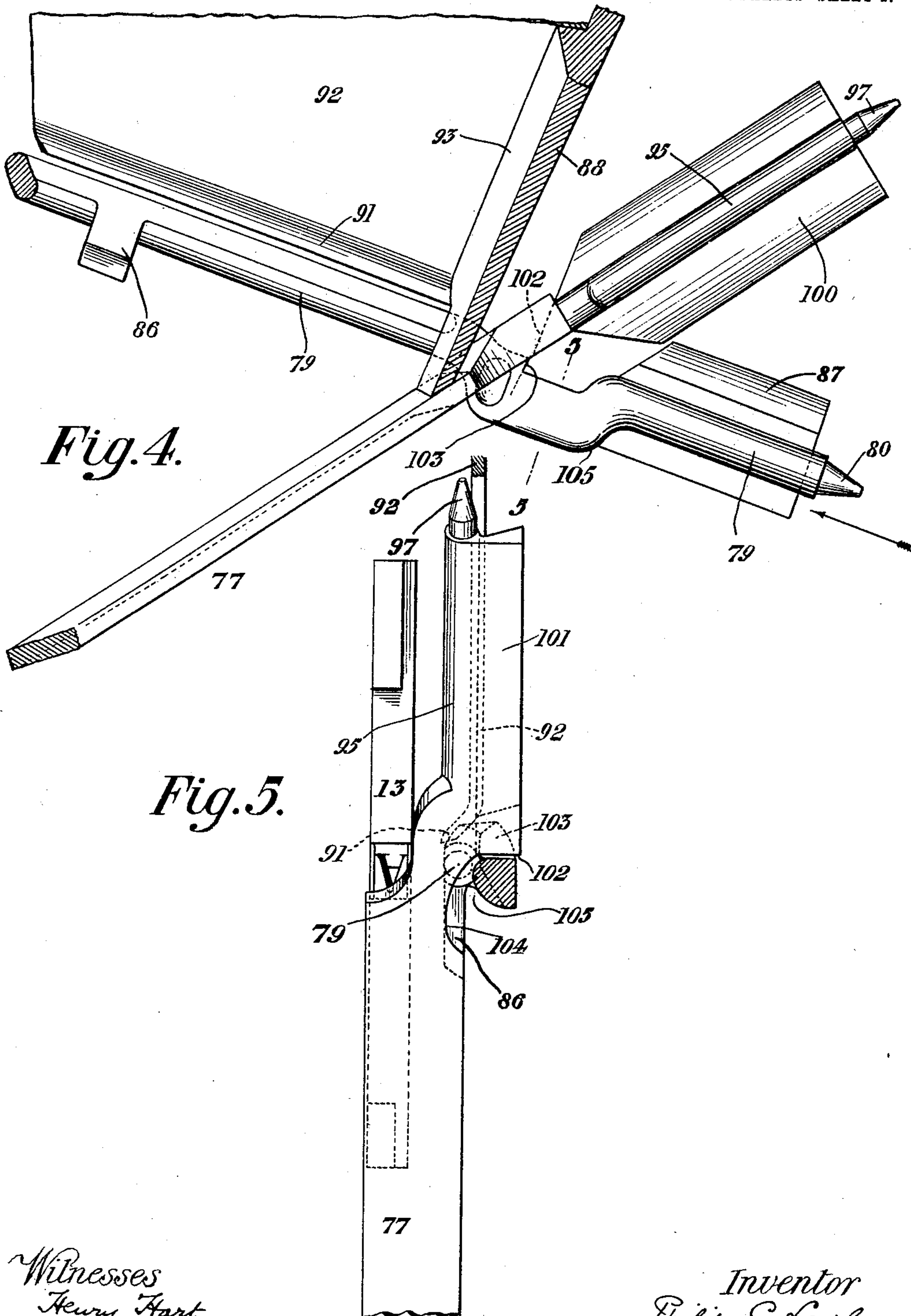
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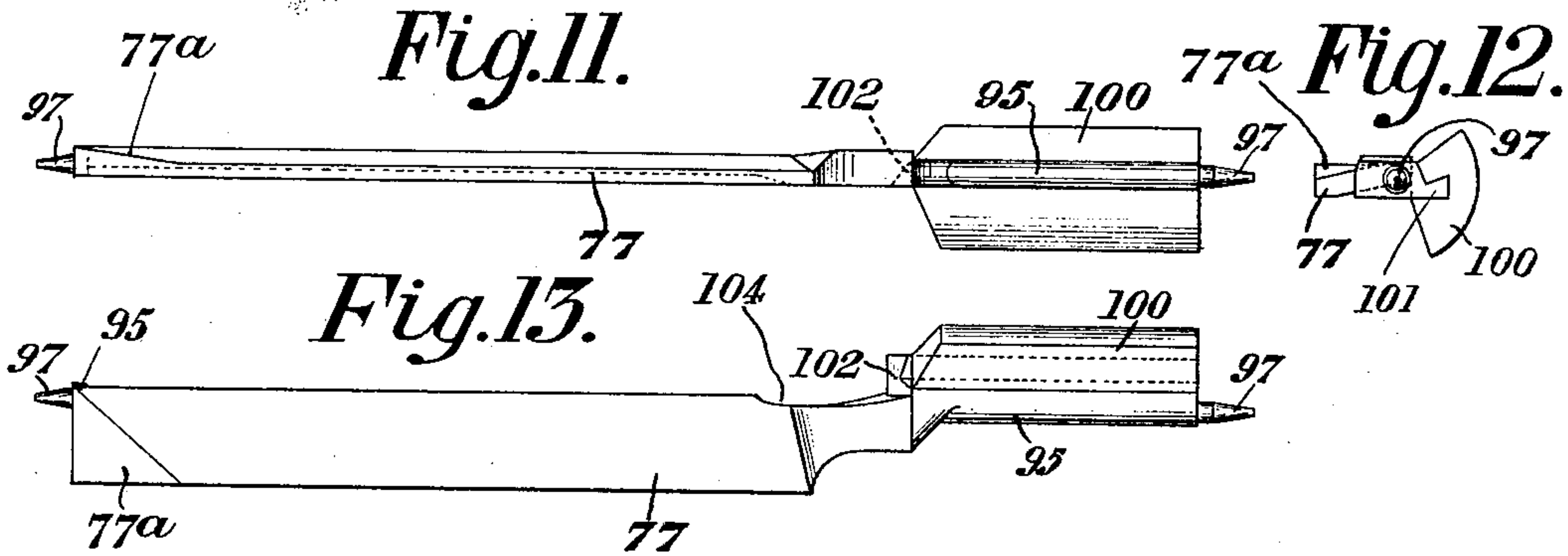
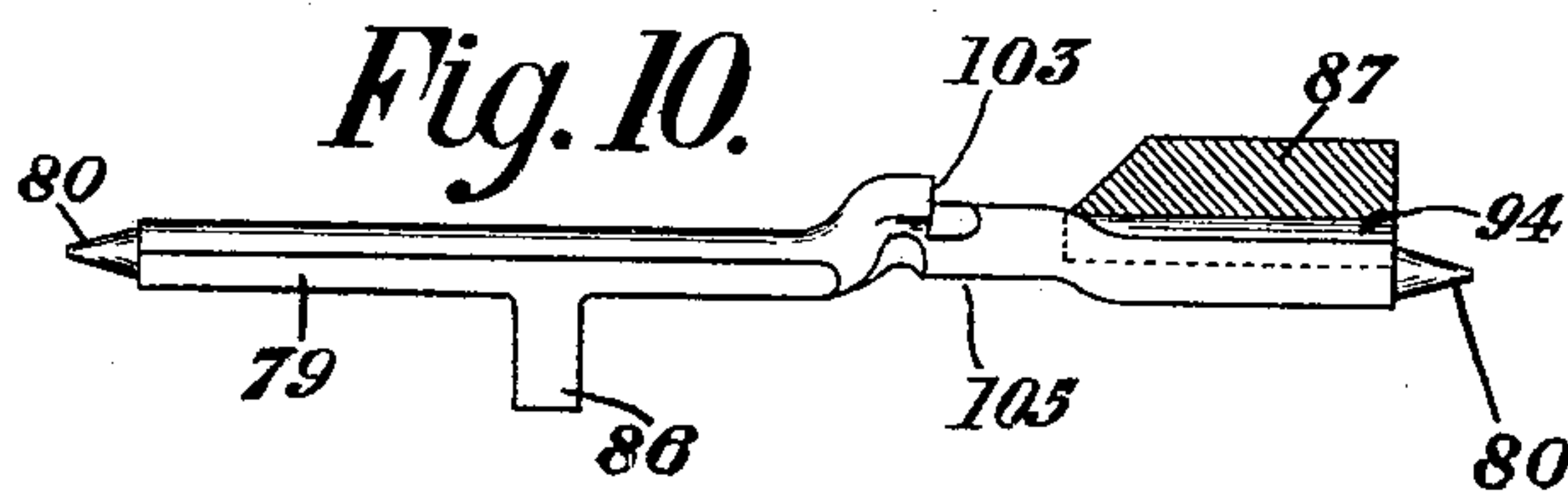
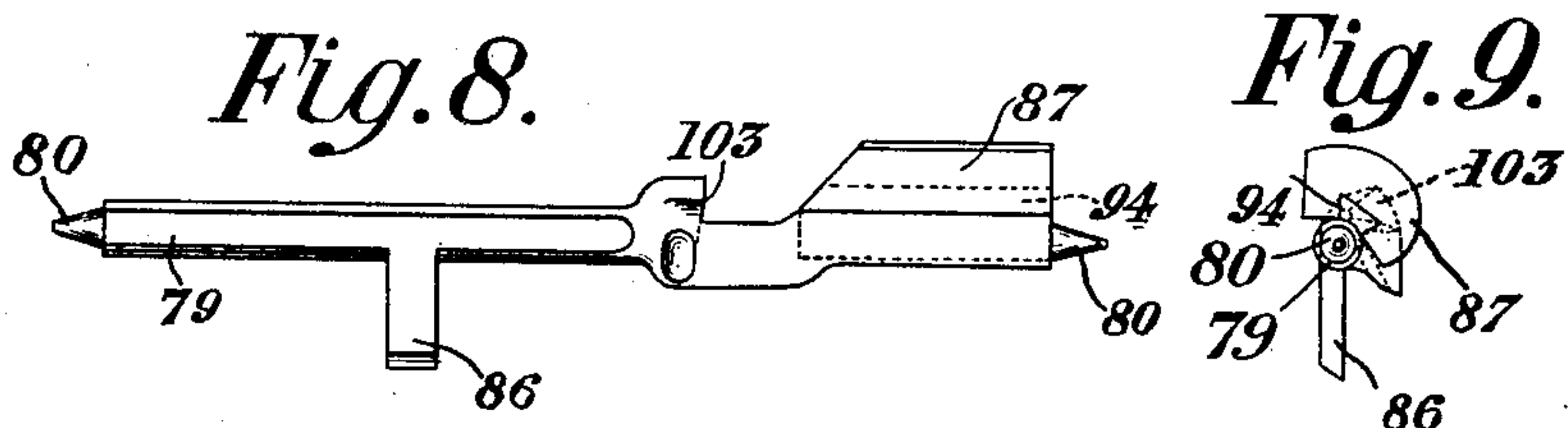
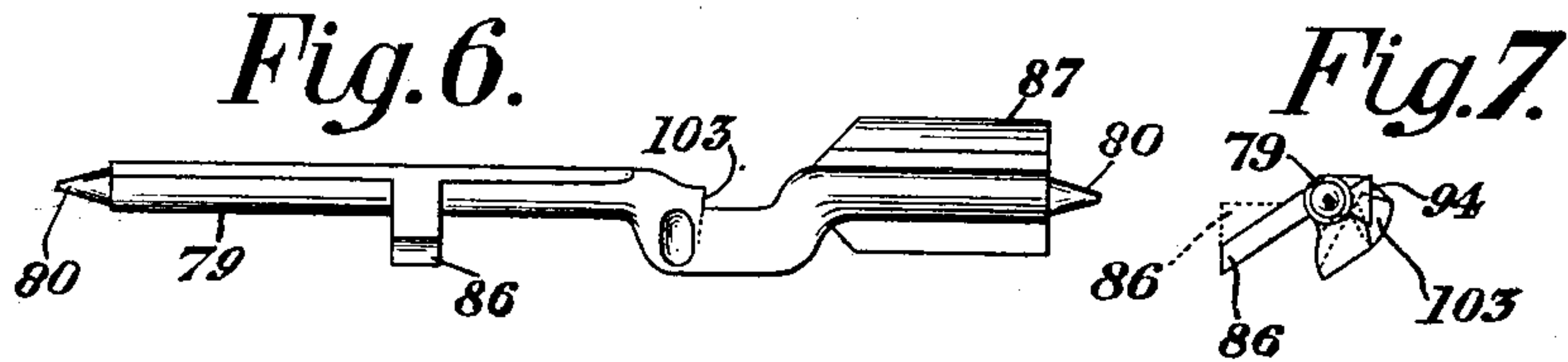
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4 SHEETS—SHEET 3.



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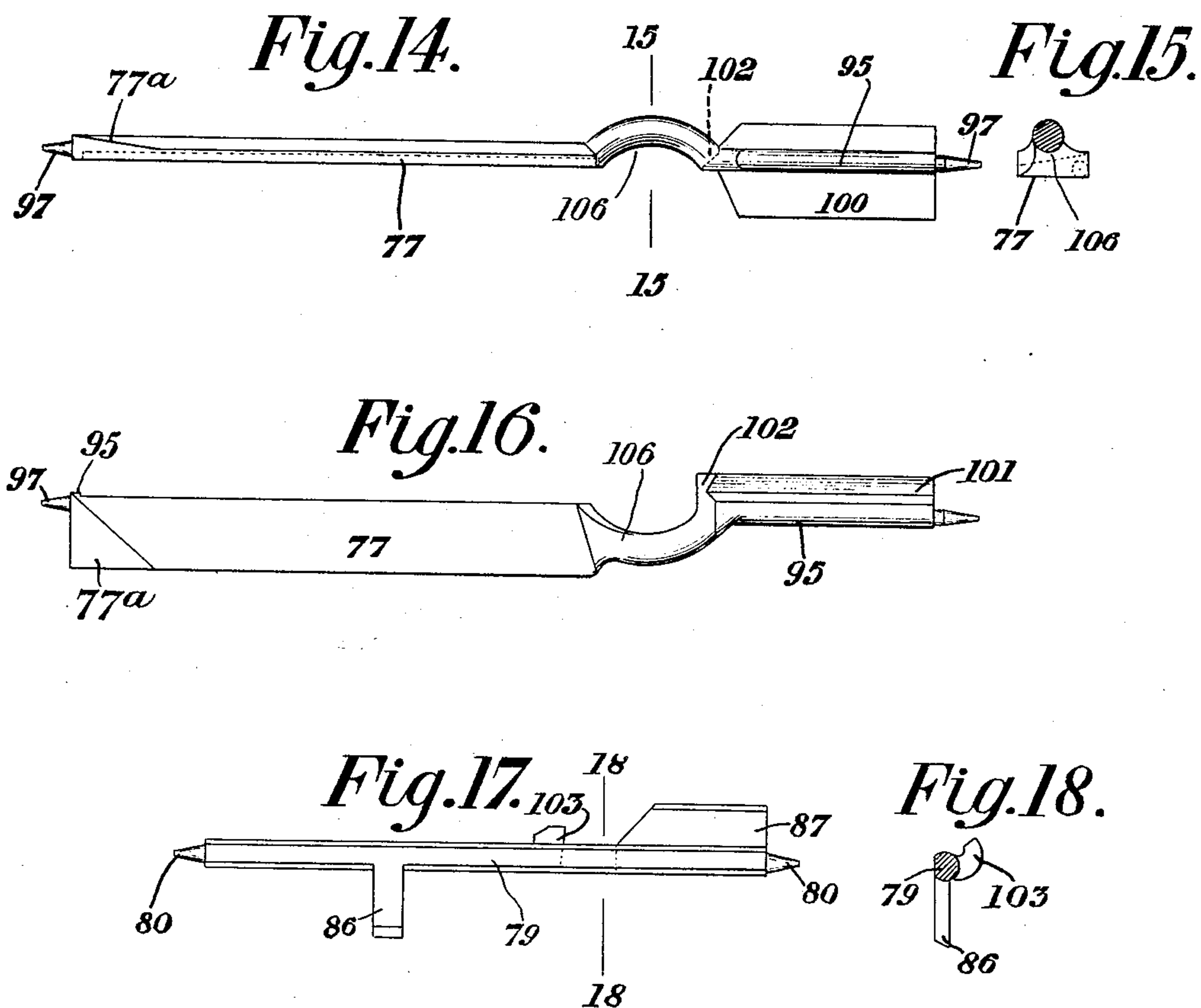
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4 SHEETS—SHEET 4.



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# UNITED STATES PATENT OFFICE.

PHILIP C. LAWLESS, OF LONDON, ENGLAND.

## MULTIPLE-MAGAZINE LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 771,160, dated September 27, 1904.

Application filed December 21, 1903. Serial No. 186,081. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP CHARLES LAWLESS, engineer, of 188 Fleet street, in the city of London, England, have invented certain new and useful Improvements in Multiple-Magazine Linotype-Machines; 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 to which it appertains to make and use the same.

The present invention relates to improvements in the Mergenthaler linotype-machine described in the specification of Letters Patent No. 436,532, dated September 16, 1890, when it is equipped with two stationary magazines, one charged with the normal—say Roman—and the other with a variant—say italic—font.

It consists in improved distributing mechanism between the distributor-bar and the magazine-throats and will be best understood by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of part of a linotype-machine constructed according to the present invention, the plane of the section being from front to back of the machine. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is an elevation of one of the variant matrices. Fig. 4 is an enlarged view of a portion of Fig. 1. Fig. 5 is a view, partly in elevation and partly in section, on line 5 5 of Fig. 4, looking in the direction of the arrow in that figure and showing the door locked through the action of a descending normal matrix. Fig. 6 is a side elevation, and Fig. 7 an end elevation of one of the door-locking rods in its normal position, the counterweight being omitted from Fig. 7. Figs. 8 and 9 are views, respectively similar to Figs. 6 and 7, showing the same rod in its locking position. Fig. 10 is a sectional plan of the same rod in its normal position. Fig. 11 is a side elevation, and Fig. 12 an end elevation, of one of the doors in its closed position. Fig. 13 is a view similar to Fig. 11, showing the door open. Figs. 14 and 16 are views, respectively corresponding to Figs. 11 and 13, of a modified construction of door, the counterweight being omitted from Fig. 16. Fig. 15 is a

transverse section on line 15 15 of Fig. 14. Fig. 17 is a side elevation of the locking-rod appropriate to the modification shown in Figs. 14, 15, and 16, and Fig. 18 is a transverse section on line 18 18 of Fig. 17.

The two magazines 1 2 lie one upon or a little above the other, (the magazine 1 being uppermost,) and the composed line of normal and variant font matrices 13 14 is delivered thereto by falling from the usual V-shaped toothed and permuted distributor-bar 70, Fig. 1, along which, in the well-known manner, it is moved by the usual distributor-screws 71 72 73. For each of the magazines 1 2 there is provided a throat 74 75, respectively, each throat being divided by vertical partitions 76 into separate channels or divisions 85, Fig. 2.

For facilitating the description and understanding of the invention the magazines 1 and 2 are herein regarded as containing matrices of the normal and variant fonts, respectively, and are accordingly referred to as the "normal" and "variant" magazines, respectively, the matrices 13 and 14, adapted to be contained in these magazines, being herein correspondingly regarded and referred to as the "normal" and "variant" matrices, respectively. It will, however, be obvious that the reverse of this arrangement may be equally well provided for in actual practice.

Each channel or division 85 of the throat appropriated to the normal matrices 13 is in the same vertical plane as the channel or division appropriated to the corresponding character of the variant font, and each channel of any such pair of superimposed channels is separated or capable of being separated from the other of the same pair by a door 77. When this door is closed, it forms, as it were, a portion or extension of the floor of the channel appropriated to the normal font and serves to direct the particular matrices into their appropriate channel. When the said door is open, it allows the matrices to fall diagonally across the throat 74 and into the throat 75, leading into the magazine 2, appertaining to the variant font. The opening of the doors 77 is effected automatically by the falling matrices of the variant font, the matrices of the normal font effecting the lock-



ing of the said doors and having no operative effect on them, so that the said normal matrices are prevented from passing into the variant magazine. When in their normal position, the doors 77 are closed, and to admit of their remaining closed to the normal font of matrices and being automatically opened by the variant font of matrices the matrices of the variant font are each provided with a gap 78, as shown in detail in Fig. 3 and in dotted lines in Fig. 1, and the matrices of the normal font are of the ordinary ungapped form, as represented in full lines in Fig. 1. The ungapped portions of the normal matrices, which correspond with the gapped portions 78 of the variant matrices, serve for locking the doors to prevent the said normal matrices passing into the variant magazine. It is immaterial whether the normal or variant font occupies the top or bottom magazine. It is, however, as already explained, assumed for the purpose of this specification that the top magazine 1 is charged with the normal font and the bottom magazine 2 with the variant one.

In the arrangement represented in Figs. 1, 2, and 4 to 13, both inclusive, there is an inclined rod 79, (shown in detail in Figs. 4 to 10,) pivoted by its two pointed ends 80 in screws 81 82, adjustable one in the front plate 83 of the top throat 74 and the other in the back plate 84 of the bottom throat 75, there being one of such rods 79 for each channel or division 85, Fig. 2, of the magazine-throat. Each rod 79 carries a finger 86, projecting from it perpendicularly to its rocking axis, and which finger, as shown in Fig. 2, it holds normally across the entrance to the respective division 85 and against the partition 76 at the side of the said division opposite to that at which is situated the rod with which it is integral. The said rods 79 are also provided each with a weight 87, (or spring,) adapted to hold it in its normal position and to return it thereto after it has been deflected therefrom by a normal matrix, as hereinafter described. When a normal matrix 13 drops from the distributor-bar 70, its ungapped foot strikes first a forwardly-inclined portion of the back plate 88 of the front throat 74 to assure the rear bottom lug 89 of the matrix taking the lead of the front bottom lug 90. A ridge or deflector 91 upon the partition 92, which separates the upper part of one division 85 from the next division just above the rod 79, prevents the latter from being struck by the falling matrix. It next strikes the finger 86, which it finds standing in its path, and rocks it down out of its path to lock the respective door. As the weight of the falling matrices will be more effective for operating the fingers 86 and opening the doors 77 the farther it is applied to those parts away from their respective rocking axes, the back plate 88 of the front throat 74 is formed with a series of

inclines 93, one for each division 85, as shown most clearly in Fig. 2, and the top surfaces of the doors are inclined transversely, these inclines being so directed as to direct the feet of the matrices away from the said axes and toward the free ends or edges of the fingers 86 and doors 77, respectively.

The shape, position, or arrangement of the fingers 86 is varied according to the thickness of the matrices by which they are adapted to be operated, so as to enable each of the rods 79 to be turned through an angle sufficient to bring the abutment 103 thereof into proper locking position. As examples of two such possible variations I have in Fig. 7 shown in dotted lines a finger of a shape suitable for operation by a thin matrix and in full lines a finger of a shape suitable for operation by a thick matrix. By comparing these two arrangements it will be seen that before a thin matrix can pass the dotted-line finger the latter will have to move through approximately the same angle as the "full-line" finger does when depressed by a thick matrix. The before-mentioned weights 87 may conveniently be formed separate from the rods 79 and be secured thereto each by means of a dovetail rib and groove 94, as shown in Figs. 7, 8, 9, and 10, or they may be formed integral with the rods or applied to them in any other desired manner. The rod 79 (represented in Fig. 7) is shown as with the weight 87 removed, so as to expose parts which would otherwise be obscured.

The doors 77 extend substantially from the top of the magazines 1 2 up to and beyond the rods 79 as far as the screws 96, Fig. 1, in which screws the upper of their pointed ends 97 are centered, these screws being adjustable in the before-described back plate 84. The lower of the pointed ends 97 are centered in screws 98, Fig. 1, adjustable in a bar 99, secured to the lower edges of the partition-plates 76, and the end of each door 77 adjacent to the appropriate screw 98 is rectangular, the before-mentioned transverse inclination becoming merged into a longitudinally-inclined portion 77<sup>a</sup>, which terminates in the above-named rectangular end. By the last-mentioned gradual thickening of the door 77 the lower end of the upper surface of the said door is at a higher level than that at which the upper edge of the bar 99 is situated, and consequently the bar cannot present any obstruction to the descending matrices. The pivot 95 of each door 77 carries a weight 100, adapted to return the door to its closed position, in which it abuts against the lower edge of the back plate 88, as represented in Figs. 1 and 4, after it has been opened by the weight of a falling variant matrix 14 and to retain it in that position until it is next again similarly operated. This weight 100 may conveniently be attached to the door-pivot 95 by means of a dovetail and groove



101, as shown best in Fig. 12. In Fig. 5 the door-pivot 95 is shown with the weight 100 detached, or the said weights 100 may be otherwise attached to or formed integral with the door-pivots 95, or they may be replaced by springs or other suitable returning devices.

The device for effecting the locking of each of the doors 77 consists of a surface 102 (see particularly Figs. 4, 11, and 13) on or carried by the pivot 95 of that door and a surface or abutment 103 (see particularly Figs. 4 to 10, both inclusive) on or carried by the corresponding rod 79. The abutment 103 is rocked into the path that the surface 102 would take if the door 77 were to open and nearly or quite close up to that surface when the door is in its closed position. Actually the axes of the rod 79 and door-pivot 95 intersect or approximately intersect each other. Practically the said rod and pivot must clear each other when the door 77 is opened or shut. To permit of this, there is a notch or recess 104, Figs. 5 and 13, in one edge of the door traversing the door's rocking axis and a crank 105, Fig. 10, in the adjacent portion of the appropriate rod 79. The rocking axes of the rod 79 and door 77 are at an angle of about sixty degrees with each other. The locking-surface 102 on the door-pivot 95 stands in a plane at right angles with the rocking axis of the rod 79 (or preferably at a slight incline to the said axis) when the door 77 is shut. The abutment 103 on the rod 79 projects from the cranked portion 105, and the engaging face of this abutment 103 is inclined to the axis about which it rocks, or, in other words, it is undercut, the directions of this incline and the incline of the locking-surface 102 being such that when the abutment 103 is in engagement with the surface 102 the impo-  
 sition of the weight of the falling matrix on the door 77 will tend to deepen or increase the said engagement. Besides the before-described ridges or deflectors 91 and the several inclines 93 on the back plate 88 for deflecting the falling matrices sidewise the partitions 76 are also provided with ridges or deflectors 110, Fig. 1, which cause the matrices to strike upon the doors 77 nearer to their closing edges than to their pivots. When a normal matrix 13 slides down over one of the doors 77, as represented in Fig. 5, the additional weight of this matrix on the said door presses the surfaces 102 on the door-pivot 95 against the abutment 103 of the rod 79 to hold the said rod against being rocked back under the influence of its returning weight 87, which rocking back, if allowed, would unlock the door 77 and allow the matrix to drop into the throat 75, leading to the variant magazine 2. In Fig. 5 the finger 86 is represented in a vertical position and out of contact with the matrix 13. Such a condition would be the result of the force of impact of a comparatively heavy matrix falling on the finger 86 near the axis of the rod 79. The distributer-notch 111, Fig.

3, of each matrix clears the finger 86 on the rod 79 before the matrix clears the door 77; but, as just explained, the weight of the matrix on the door suffices to keep the rod 79 locked against being rocked back. When the matrix has cleared the door 77, or nearly so—*i. e.*, when the whole of it or nearly the whole of it is in the appropriate magazine 1—the door 77 ceases to lock the rod 79, and the latter by its counterweight 87 is rocked back into its normal position, thereby unlocking the door 77, which as soon as the matrix has entirely moved off it is held closed under the influence of only the weight 100, which latter retains it in contact with the lower edge of the back plate 88 until it is next opened by a descending matrix.

When a variant matrix 14 drops from the distributer-bar 70, it takes the same path as a normal matrix 13 as far as the door 77, the forward inclination of the back plate 88 of the front throat 74 insuring that the bottom rear lug 89 of the matrix shall strike the door 77 before the body of the matrix engages the finger 86, the gap 78 in the foot of the matrix meanwhile clearing the finger, so that the door stands unlocked ready for being opened, and the impact of the matrix against the door 77 opens the latter against the influence of the weight 100 far enough to prevent the abutment 103 on the rod 79 (which will be rocked by the engagement of the ungapped portion of the matrix with the finger 86) locking the door 77. The variant matrix 14 passes the finger 86 before it is through the doorway, and the returning device 100 of the door 77 shuts the latter as soon as the matrix has passed through. The rod 79 and finger 86 are then rocked back to their normal positions by the before-described returning device 87.

Instead of the pivoted rod 79 being cranked and the door-pivot 95 being substantially straight or uncranked, as hereinbefore described, the rod 79 may be straight, as shown most clearly in Fig. 17, and a crank 106 may be formed in the door-pivot 95, as shown in Figs. 14, 15, and 16. With a straight rod 79, such as shown in Figs. 17 and 18, the abutment 103 must, as represented in those figures, project outward from the said rod, so as to enable it to be presented in proper locking position in front of the locking-surface 102 on the door-pivot 95 at the right moment.

Each of the before-mentioned partitions 76, besides being formed with the above-described ridge 110, is provided with two forwardly and two rearwardly-projecting perforated lugs 107, each of which passes through a slot in the front plate 83 or back plate 84, respectively, of the magazine-throats 74 75, respectively, the lugs 107 of the several partitions forming four straight rows, and all the perforations in each such row being alined with each other. Through each such alined row of perforations is threaded a wire 108, these four wires serv-



ing to bind together the partitions 76 and the plates 83 84 as one piece. The parts of the partitions 76 situated at the upper end of the magazine-throat 75 are bent at right angles or substantially at right angles to the other or main parts of the partitions to form distance-pieces 109, Fig. 1, between the partitions and to prevent any lateral rocking of the partitions relatively to the plates 83 84.

10 I claim—

1. In a multiple-magazine linotype-machine the combination with the magazines and a throat between the distributor and the magazines, through which the matrices pass, of doors adjustable in the said throat, which doors in one position direct the matrices into one of the magazines, and in a second position direct the matrices into the other magazine, two fonts of matrices, gaps in the matrices of one font, and devices in the path of the matrices, for controlling the adjustable doors and adapted to be operated by matrices of one of the fonts and unaffected by matrices of the other font.

2. In a multiple-magazine linotype-machine the combination with the magazines and throats between the distributor and the magazines, through which the matrices pass, of doors pivotally connected with the respective throats, which doors in one position direct the matrices into one of the magazines, and in a second position, allow the matrices to enter the other magazine.

3. In a multiple-magazine linotype-machine the combination of the magazines, a throat between the distributor and the magazine, through which the matrices pass, doors adjustable in the throat, controlling the entrance of the matrices to the magazines, a device operatively connected with each door for returning it to its normal position, and a locking device in the path of the matrices adapted to lock the door to prevent it from being operated by the matrices.

4. In a multiple-magazine linotype-machine the combination of the magazines, a throat between the distributor and the magazines through which the matrices pass, doors adjustable in the throat, in the path of the matrices, said doors intercepting the passage of the matrices to one of the magazines, and adapted to open under the weight of the matrices, and a device in operative connection with each door for returning it to its closed position.

5. In a multiple-magazine linotype-machine the combination of the magazines, a throat between the distributor and the magazines, through which the matrices pass, doors adjustable in the throat, in the path of the matrices, said doors intercepting the passage of the matrices to one of the magazines, and adapted to open under the weight of the matrices and operated by them to lock the doors in their closed position.

6. In a multiple-magazine linotype-machine the combination of the magazines, a throat between the distributor and the magazines, through which the matrices pass, doors adjustable in the throat, in the path of the matrices, said doors normally obstructing the passage to one of the magazines, and adapted to open under the weight of the matrices, a device on each door for returning it to its normal position, a device in the path of the matrices and operated by them to lock the door in its normal position, and a device on this locking device adapted to effect the unlocking of the door.

7. In a multiple-magazine linotype-machine the combination of the magazines, a throat between the distributor and the magazines, through which the matrices pass, a door adjustable in the throat, in the path of the matrices, said door normally obstructing the passage to one of the magazines, a device in the path of the matrices and operated by them to lock the door in its normal position, two fonts of matrices, gaps in the matrices of one font, the matrices of one font operating the locking device to retain the door closed and the matrices of the other font missing the locking device and opening the door.

8. In a multiple-magazine linotype-machine the combination of the magazines, a throat between the distributor and the magazines, through which the matrices pass, pivoted doors adjustable in the throat, in the path of the matrices, said doors normally obstructing the passage to one of the magazines, a rod adapted to rock about its longitudinal axis which axis intersects the pivotal axis of each of the doors, a locking-surface on each door, an abutment on each rod adapted to engage the locking-surface, and a finger on the said rod in the path of the matrices.

9. In a linotype-machine the combination of two magazines, a throat between the distributor and the magazines, through which the matrices pass, partitions in the throat dividing it into separate channels, a pivoted door in each such channel dividing it into two parts each connecting with a channel of one of the magazines, a locking-surface on the door, a pivoted rod, the pivotal axis of which intersects that of the door, an abutment on the rod adapted to engage the locking-surface on the door, a finger on the rod in the path of the matrices, and deflectors on the partitions to deflect the matrices away from the pivotal axes of the door and rod.

10. In a linotype-machine the combination of two magazines, a throat between the distributor and the magazines, through which the matrices pass, partitions in the throat dividing it into separate channels, a pivoted door in each such channel dividing it into two parts each connecting with a channel of one of the magazines, a locking-surface on the door, a pivoted rod, the pivotal axis of which inter-



sects that of the door, an abutment on the rod adapted to engage the locking-surface on the door, a finger on the rod in the path of the matrices, two fonts of matrices, and gaps in the matrices of one font to prevent those matrices from operating the finger.

11. In a linotype-machine, the combination of two magazines, a throat between the distributor and the magazines, through which the matrices pass, pivoted doors adjustable in the throat, in the path of the matrices, said doors intercepting the passage of the matrices to one of the magazines, a locking-surface on the door, a pivoted rod, the pivotal axis of which intersects that of the door, an abutment on the rod adapted to engage the locking-surface on the door, and a crank in the pivoted rod to clear the door-pivot at the part at which the before-mentioned axes intersect.

12. In a linotype-machine the combination of two magazines, a throat between the distributor and the magazines, through which the matrices pass, pivoted doors adjustable in the throat, in the path of the matrices, said doors intercepting the passage of the matrices to one of the magazines, a locking-surface on the door, a pivoted rod, the pivotal axis of which intersects that of the door, an abutment on the rod adapted to engage the locking-surface on the door, and a crank in the door-pivot to clear the rod at the part at which the before-mentioned axes intersect.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

PHILIP C. LAWLESS.

Witnesses:

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