

No. 771,162.

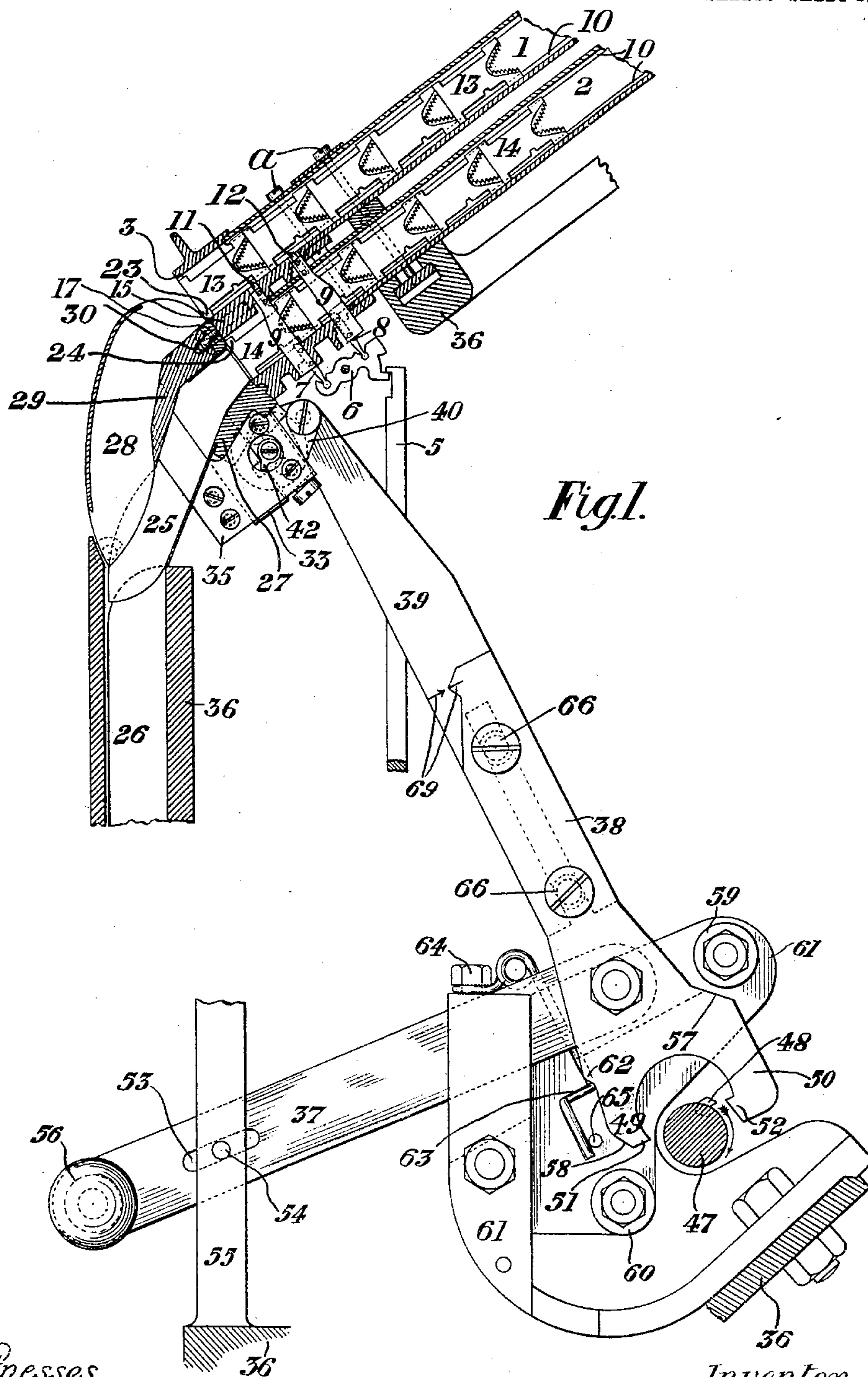
PATENTED SEPT. 27, 1904.

P. C. LAWLESS.  
MULTIPLE MAGAZINE LINOTYPE MACHINE.

APPLICATION FILED DEC. 21, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



*Fig. 1.*

Witnesses  
Henry Hart  
Warwick Thyl Williams

Inventor  
Philip C. Lawless.  
per Charles S. Woodruff  
Attorney

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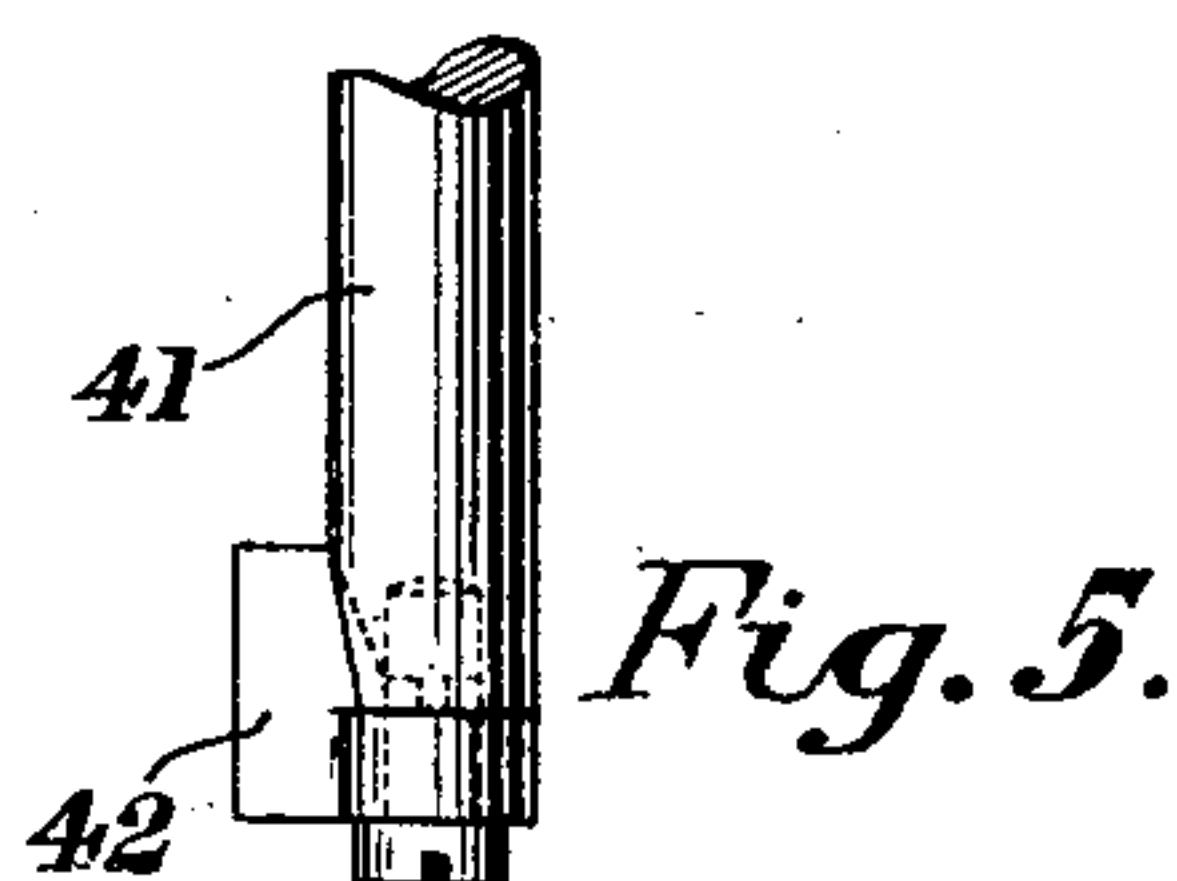
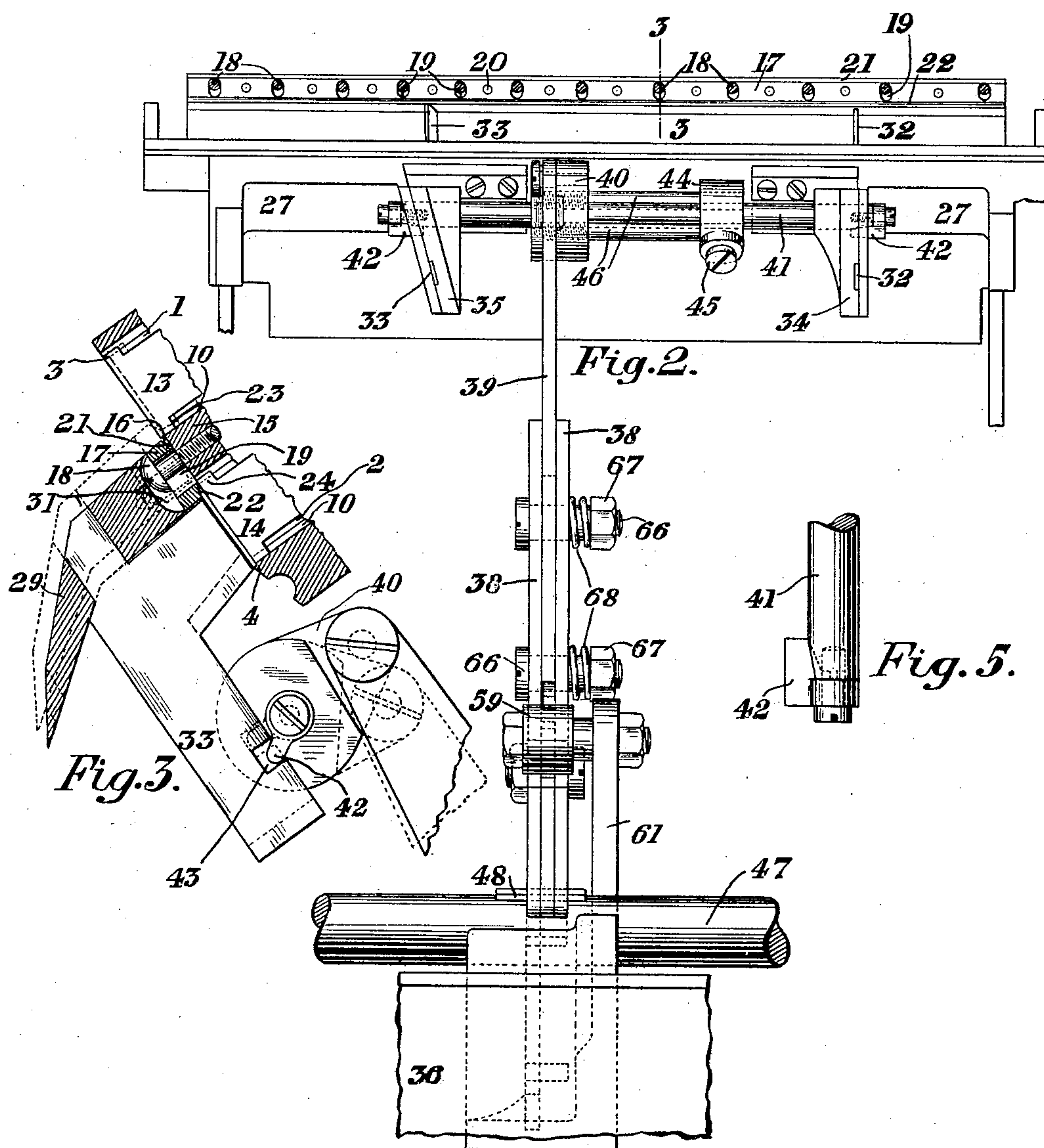
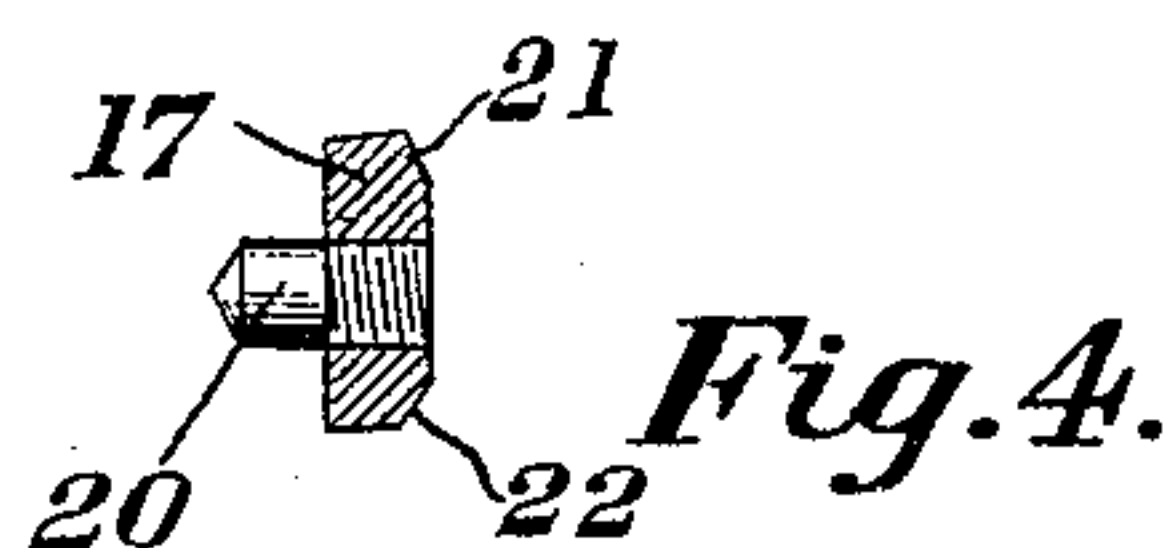
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Henry Hart.  
Kerwick H. Williams

Inventor  
Philip C. Lawless.  
per *Charles S. Woodroffe*  
Attorney



# UNITED STATES PATENT OFFICE.

PHILIP C. LAWLESS, OF LONDON, ENGLAND.

## MULTIPLE-MAGAZINE LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 771,162, dated September 27, 1904.

Application filed December 21, 1903. Serial No. 186,083. (No model.)

*To all whom it may concern:*

Be it known that I, PHILIP C. LAWLESS, 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, both magazines being controlled by one set of escapement rods and levers, the matrices of both fonts dropping from the respective magazine-mouth through Y-shaped channels or intermediate matrix-guides on their way to the assembler-belt.

It consists in improved means for opening the mouth of one magazine and closing that of the other and improved Y-shaped channels from the bottom mouths of the magazines to the assembler-plate, all as hereinafter more fully described, and more particularly pointed out in the claims.

In the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a vertical section of part of a linotype-machine constructed according to the present invention, the view being taken from the right-hand side of the machine. Fig. 2 is a rear elevation of part of the mechanism shown in Fig. 1 as seen from the right-hand side of that figure. Fig. 3 is an enlarged view of a part of Fig. 1, partly in section on the line 3 3 of Fig. 2. Fig. 4 is a transverse section of a bar 17, hereinafter described; and Fig. 5 is a plan of a part of a rocking shaft 41, also hereinafter more particularly described.

The two magazines 1 2 lie one upon or a little above the other (the magazine 1 being uppermost) with their bottom mouths 3 4, respectively, in the same oblique plane, as shown

most clearly in Fig. 3, the said magazines being rigidly secured to each other by screws *a*, Fig. 1, or in any other convenient manner. The escapement-rods 5, Fig. 1, and (excepting as regards the features hereinafter mentioned) the escapements themselves are substantially like those described in the specification above mentioned, the escapements comprising the usual double-ended escapement-levers 6, hooked as ordinarily to the escapement-rods 5, and the ordinary escapement-pawls 7 8, pivotally connected with the front and rear ends, respectively, of the said escapement-levers 6. Unlike the existing arrangement, however, the pawls 7 8 have plates 9 attached to them, which completely traverse the lower magazine 2 and are free to slide in the direction of their length in guides formed in the lower walls of the two magazines 1 and 2 in the usual ribs 10, Figs. 1 and 3, occurring between every two adjacent matrix-channels of such magazines. To the upper ends of the plates 9 are secured pawls 11 and 12, acting in unison, respectively, with the pawls 7 and 8 and adapted to control the release of the matrices 13 in the magazine 1 in the same manner as the pawls 7 and 8 control the release of the matrices 14 in the magazine 2.

For facilitating the description and understanding of the invention the matrices 13 and 14 are hereinafter regarded as belonging, respectively, to the normal and variant fonts; but it will readily be observed that the reverse of this arrangement may be equally well provided for in actual practice.

The portion 15 of the magazines 1 and 2 situated between the two mouths of the latter and extending throughout the length of such mouths is cut away to form a recess 16, as shown most clearly in Fig. 3, in which recess a bar 17 is capable of being moved from its lower position, in which it is shown in full lines in Fig. 3, to its higher position, in which it is represented in dotted lines in that figure, and vice versa. The bar 17 is retained in close sliding contact with the portion 15 by a number of round-headed guide-screws 18, screwed into the said portion 15, and the shanks of which screws pass through slots 19 in the bar



17, which slots are of such lengths as will admit of the bar moving freely from one to the other of the two before-mentioned terminal positions. The screws 18 are shown in transverse section in Fig. 2. The bar 17 is also provided with a number of dowel-pins 20 for a purpose hereinafter described, these pins being either screwed into the said bar, as shown in Fig. 4, or secured to it in any other suitable manner, and the said bar is moreover chamfered off at its two rear edges to form cam-surfaces 21 22, also hereinafter more particularly referred to.

The bar 17 is adapted to obstruct or partially close the mouths of the two magazines 1 2 alternately, one mouth being obstructed while the other is fully open. Thus when the bar is in the position in which it is shown in full lines in Fig. 3 it projects partly across the mouth of the magazine 2 and into the downward path of the variant matrices 14, which are thereby locked in the said magazine, the mouth of the magazine 1 at that time being fully open, so as to admit of the unrestricted passage of the normal matrices 13 there-through. When the bar 17 is in the position in which it is shown in dotted lines in Fig. 3, the normal matrices 13 are locked by it in the magazine 1 and the variant matrices 14 are left free to pass out of the mouth of the magazine 2. The bar 17 effects the above-mentioned locking of the normal matrices 13 by engaging with the lug 23 of the then lowermost of such matrices contained in the magazine 1, and it similarly effects the locking of the variant matrices 14 by engaging with the lug 24 of the then lowermost of such matrices contained in the magazine 2. To relieve the escapement-pawls 7 or 11 (according to the particular magazine which it is required to render inoperative) of the weight of the matrices contained in that magazine, it is necessary to push the said matrices upward, so that the lowermost of such matrices are removed out of contact with those pawls, and it is for that purpose that the bar 17 is provided with the before-mentioned cam-surfaces 21 and 22, which when the said bar is moved up or down engage the matrix-lugs 23 or 24, respectively, and thereby effect the necessary raising of the columns of matrices in the respective magazines 1 2. These operations will be well understood by referring to Fig. 3, wherein the bar 17 is represented in its full-line position as holding the variant matrices 14 of the magazine 2 out of contact with their respective pawls 7, Fig. 1, and in its dotted-line position as holding the normal matrices 13 of the magazine 1 out of contact with their respective pawls 11.

The intermediate matrix-guides 25 for guiding the variant matrices 14 from the magazine 2 to the assembler-plate 26 are of substantially the ordinary construction, being secured to or formed in part with a bar 27, suitably at-

tached to the mouth of the magazine 2, while the corresponding guide 28, appertaining to the normal magazine 1, is secured to or formed in part with a bar 29 of angle-shaped section and suitably attached to and capable of moving with the before-described bar 17. The guides 28 connect with the guides 25 and with the channels of the assembler-plate 26 just below the front edge of the bar 29, the two sets of guides forming Y-shaped conduits leading from the two magazines 1 2 to the single assembler-plate. The rear edge of the bar 29 is provided with recesses 30, Fig. 1, and 31, Fig. 3, the former for receiving the before-mentioned dowel-pins 20, which serve for operatively connecting together the bars 17 and 29, and the latter for accommodating the heads of the before-mentioned screws 18, as shown clearly in Fig. 3. The bar 29 is rigidly attached to two downwardly-depending plates 32 33, which are free to slide vertically in guides or brackets 34 35, respectively, secured to the before-mentioned bar 27, as shown in Fig. 2. The side faces of the plate 32 are perpendicular to the general plane of the range of guides 25, but the corresponding faces of the plate 33 are inclined to that plane to conform with the skew which, as usual, is given to the said guides at the right-hand side of the assembler-plate 26—that is to say, the left hand of Fig. 2.

The two bars 17 and 29 and the series of matrix-guides 28 are moved from one to the other of their two terminal positions as if in one piece with each other by any suitable link-and-lever mechanism worked by the operator at the keyboard of the machine. The preferred arrangement of apparatus for effecting these last-mentioned movements consists, as shown in Figs. 1, 2, 3, and 5, of a push-rod 37, pivoted to the bottom end of a two-part connecting-rod 38 39, the upper end of which is pivoted to the rear or vibrating end of a short lever-arm 40, mounted loosely on and yieldingly or flexibly connected with a shaft 41. This shaft 41 is journaled in the two before-mentioned brackets 34 35 and has secured to its two ends fingers or blades 42, (see particularly Figs. 3 and 5,) each adapted to engage a notch or recess 43 in the appropriate plate 32 or 33. The means for yieldingly or flexibly connecting the lever-arm 40 with the shaft 41, as shown in Fig. 2, consists of a buffer device comprising a collar 44, secured by a screw 45 or otherwise on the said shaft and connected with the boss of the lever-arm 40 by means of two flexible steel or other rods 46, engaging at their respectively opposite ends with the said collar and boss. By this arrangement if there should at any time that the connecting-rod 38 39 is operated be an obstruction which might prevent the proper working of the shaft 41 the two rods 46 will bend and prevent any damage to the machine, the said rods resuming their



normal straight condition as soon as the pressure upon the connecting-rod 38 39 is removed.

On a constantly-rotating shaft 47, behind the escapement-rods 5, there is provided a blade or finger 48, adapted to engage with the end of the lower part 38 of the two-part connecting-rod 38 39. For this purpose this said end is forked, as shown in Fig. 1, the two prongs or tines 49 50 standing one at the front and the other at the back of the shaft 47 in the plane of rotation, but normally out of reach of the blade 48. The two fork-prongs 49 50 are respectively provided each with a tooth or abutment 51 52, the former adapted to be engaged by the blade 48 when the latter is at the front or ascending side of the shaft 47 and the latter adapted to be engaged with the blade 48 when the latter is at the back or descending side of the shaft. The push-rod 37 is free to slide in the direction of its length, for which purpose it is provided near its front end with a slot 53, by which it is guided longitudinally on a pin 54, supported in a standard 55, rigid on the fixed machine-framing 36, and the said push-rod is provided with a suitable handle 56, by which it can be readily operated. If the push-rod 37 is, say, pushed rearward by the operator, the abutment 51 is engaged by the rotating blade or finger 48 and the connecting-rod 38 39 is pushed up thereby through the before-described operatively-connected lever-arm 40, rods 46, collar 44, shaft 41, fingers 42, plates 32 33, and bar 29, moving the bar 17 downward to open the mouth of the upper magazine 1 to obstruct that of the lower magazine 2 and by means of the inclined cam-face 22 to push upward the matrices 14 in the said lower magazine to take their weight off the escapement-pawl 7, all as indicated in Fig. 1. If the push-rod 37 is, say, pulled forward by the operator, the abutment 52 is engaged by the rotating blade or finger 48 and the connecting-rod 38 39 is pulled down thereby through the parts 40, 46, 44, 41, 42, 32, 33, and 29, moving the bar 17 upward to open the mouth of the lower magazine 2 and obstruct that of the upper magazine 1 and by means of the inclined cam-face 21 to push upward the matrices 13 in the said upper magazine to take their weight off the escapement-pawl 11, as indicated in dotted lines in Fig. 3. When the connecting-rod 38 39 has been pushed or pulled far enough, a detaching device disengages it from the rotating blade or finger 48 and returns it and the push-rod 37 to their respective central or normal positions. This detaching device, as shown in Figs. 1 and 2, consists of inclined cams 57 58, formed, respectively, on the back and front edges of the connecting-rod part 38, and two antifriction-rollers 59 60, with which these cams are respectively adapted to come into operative contact. The two rollers 59 and 60 are journaled

on studs projecting from a bracket 61, secured to the fixed machine-framing 36. When the lower end of the connecting-rod 38 39 has been moved backward and the said rod is consequently engaged and moved upward by the rotating finger 48, the cam 57 is brought into contact with the roller 59, which through the continued movement of the cam 57 against it causes the lower end of the connecting-rod to move forward, and thereby disengages it from the finger 48. When, reversely, the lower end of the connecting-rod 38 39 has been moved forward and the said rod is consequently engaged and moved downward by the rotating finger 48 engaging the abutment 52, the cam 58 is brought into contact with the roller 60, which through the continued movement of the cam 58 over it causes the lower end of the connecting-rod to move backward, and thereby disengages the abutment 52 from the finger 48, and the said connecting-rod 38 39 thereafter remains in its lowermost inoperative position until it is next moved rearward by the operator pushing the rod 37 backward. The lower part 38 of the connecting-rod 38 39 is provided with a shoulder 62, adapted to be engaged by a spring-detent 63, which serves to support the said connecting-rod as long as the latter is not in engagement with the finger 48. At one end this spring-detent 63 is secured to the bracket 61 by a bolt 64, and the rearward motion of its other end is limited by a stop-pin 65, fast to the said bracket.

Besides the buffer device 44 45 46, by which the lever-arm 40 is connected to its shaft 41, as previously described, there may also be another one provided in the connecting-rod 38 39, which device, like the one already described, serves to prevent accident in the event of a matrix being left in the path of the bar 17 or in the event of the rotating finger 48 moving the lower part 38 of the connecting-rod 38 39 too far, or this connecting-rod buffer device may be the only one provided. It is for endowing the connecting-rod with this compensating function that it is constructed of the two before-described parts 38 and 39, and but for this it might obviously be in one part. The upper end of the part 38 is forked to admit between the two sides thereof the lower end of the part 39, which last-named end is also forked, as indicated in dotted lines in Fig. 1, to admit of the passage therethrough of two bolts or screws 66, whereon are threaded nuts 67, between which and the adjacent surface of the part 38 are provided springs 68, encircling the said screws. By these means the two parts 38 39 are secured together by frictional pressure, which may be increased or decreased by adjusting the nuts 67 on the bolts 66. In order to enable the two parts 38 39 to be re-adjusted to their proper relative working position after these positions have been disturbed



by, say, an obstruction such as above mentioned, each of these parts is provided with an index 69, which, as shown in Fig. 1, coincides with the other index when the two parts are in proper adjustment. The part 38 in Fig. 2 of the drawings is shown to be of laminated construction, this being a convenient way of providing for the forking of its upper end; but, if desired, it may be formed in any other suitable manner.

I claim—

1. In a linotype-machine the combination of superposed magazines for normal and variant matrices respectively, escapement-pawls for the normal and variant matrices, escapement-levers operatively connected each with the escapement-pawls appertaining to corresponding characters of the different fonts and adapted to be operated by the same key of the keyboard, a bar movable between the mouths of the magazines to obstruct the said mouths in alternation, cams on the said bar to move the matrices in their respective magazines, devices operatively connected with the bar adapted to automatically raise and lower it, means connected with the said devices for manually engaging the said devices, and means adapted to automatically disengage these devices.

2. In a linotype-machine the combination of superposed magazines for different fonts of matrices, a bar movable between the mouths of the magazines, and adapted to obstruct the said mouths in alternation, devices operatively connected with the bar adapted to automatically raise and lower it, means connected with the said devices for manually engaging the said devices, and means adapted to automatically disengage these devices.

3. In a linotype-machine the combination of superposed magazines for different fonts of matrices, a bar slidable transversely to its length between the mouths of the magazines and adapted to obstruct the said mouths in alternation and cams on the bar to alternately move the different fonts of matrices in their respective magazines.

4. In a linotype-machine, the combination of two superposed magazines for different fonts of matrices, assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, a bar transversely movable between the mouths of the magazines and adapted to obstruct the said mouths in alternation, and intermediate matrix-guides in operative connection with the movable bar, movable into and out of register with the other of the magazines to place the said magazine in and out of operative connection with the assembler-plate.

5. In a linotype-machine, the combination of two superposed magazines for different fonts of matrices, assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, mov-

able intermediate matrix-guides movable into and out of register with the other of the magazines to place the said magazine in and out of operative connection with the assembler-plate, and devices operatively connected with the movable matrix-guides to automatically raise and lower them.

6. In a linotype-machine, the combination of two superposed magazines for different fonts of matrices, assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, movable intermediate matrix-guides movable into and out of register with the other of the magazines to place the said magazine in and out of operative connection with the assembler-plate, devices operatively connected with the movable matrix-guides to automatically move them from one to the other of their terminal positions, and means connected with the said devices for manually engaging the said devices and automatically disengaging them.

7. In a linotype-machine the combination of superposed magazines for different fonts of matrices, escapement-pawls for each magazine, the pawls of one magazine being rigidly connected with those of the other magazine.

8. In a linotype-machine, the combination of superposed magazines for different fonts of matrices, assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, movable intermediate matrix-guides connecting the other of the magazines with the assembler-plate, notched plates depending downwardly from the movable guides, stationary guides for the said plates, rocking blades engaging the notches of the plates, a shaft carrying these blades, devices operatively connected with the shaft for automatically rocking it, and means connected with the said devices for manually engaging and automatically disengaging them.

9. In a linotype-machine, the combination of superposed magazines for different fonts of matrices, a bar movable between the mouths of the magazines and adapted to obstruct the said mouths in alternation, a rocking shaft in operative connection with the bar for moving the said bar from one to the other of its terminal positions, devices operatively connected with the shaft for automatically rocking it, and means connected with the said devices for manually engaging and automatically disengaging them.

10. In a linotype-machine the combination of superposed magazines for different fonts of matrices, a bar movable between the mouths of the magazines and adapted to obstruct the said mouths in alternation, a rocking shaft in operative connection with the bar for moving the said bar from one to the other of its terminal positions, a lever-arm on the rocking shaft, a rod pivoted to the lever-arm, a fork on this rod, abutments on the arms of the fork, a shaft rotating between the arms of the fork and a



finger on the rotating shaft adapted to engage the abutments.

11. In a linotype-machine, the combination of two superposed magazines for different fonts of matrices, an assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, movable intermediate matrix-guides movable into and out of register with the other of the magazines to place the said magazine in and out of operative connection with the assembler-plate, a rocking shaft in operative connection with the movable matrix-guides, devices operatively connected with the said movable matrix-guides to automatically move them from one to the other of their terminal positions, and a buffer in operative connection with the last-named devices for admitting of their movement relatively to the movable matrix-guides.

12. In a linotype-machine the combination of two superposed magazines for different fonts of matrices, an assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, movable intermediate matrix-guides movable into and out of register with the other of the magazines to place the said magazine in and out of operative connection with the assembler-plate, a rocking shaft in operative connection with the movable matrix-guides, adapted to move them from one to the other of their terminal positions, a lever-arm loose, and a collar fast, on the rocking shaft and flexible rods connecting the lever-arm with the collar.

13. In a linotype-machine the combination of two superposed magazines for different fonts of matrices, an assembler-plate, stationary intermediate matrix-guides connecting

one of the magazines with the assembler-plate, movable intermediate matrix-guides movable into and out of register with the other of the magazines to place the said magazine in and out of operative connection with the assembler-plate, a rocking shaft in operative connection with the movable matrix-guides adapted to move them from one to the other of their terminal positions, a lever-arm on the shaft, a two-part rod operatively connected with the lever-arm for imparting the rocking motion thereto, bolts traversing the said two parts and springs and nuts on the bolts for holding these parts together with yielding pressure.

14. In a linotype-machine the combination of two superposed magazines for different fonts of matrices, an assembler-plate, stationary intermediate matrix-guides connecting one of the magazines with the assembler-plate, movable intermediate matrix-guides movable into and out of register with the other of the magazines to place the said magazines in and out of operative connection with the assembler-plate, a rod operatively connected with the movable matrix-guides adapted to effect the said movement, a fork on this rod, abutments on the arms of the fork, a shaft rotating between the arms of the fork, a finger on the rotating shaft adapted to engage the abutments, a shoulder on the rod, and a spring-detent on the machine-frame adapted to engage the shoulder to support the rod in its inoperative position.

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

PHILIP C. LAWLESS.

Witnesses:

WARWICK HY. WILLIAMS,  
WALTER J. SKERTEN.