

No. 688,218.

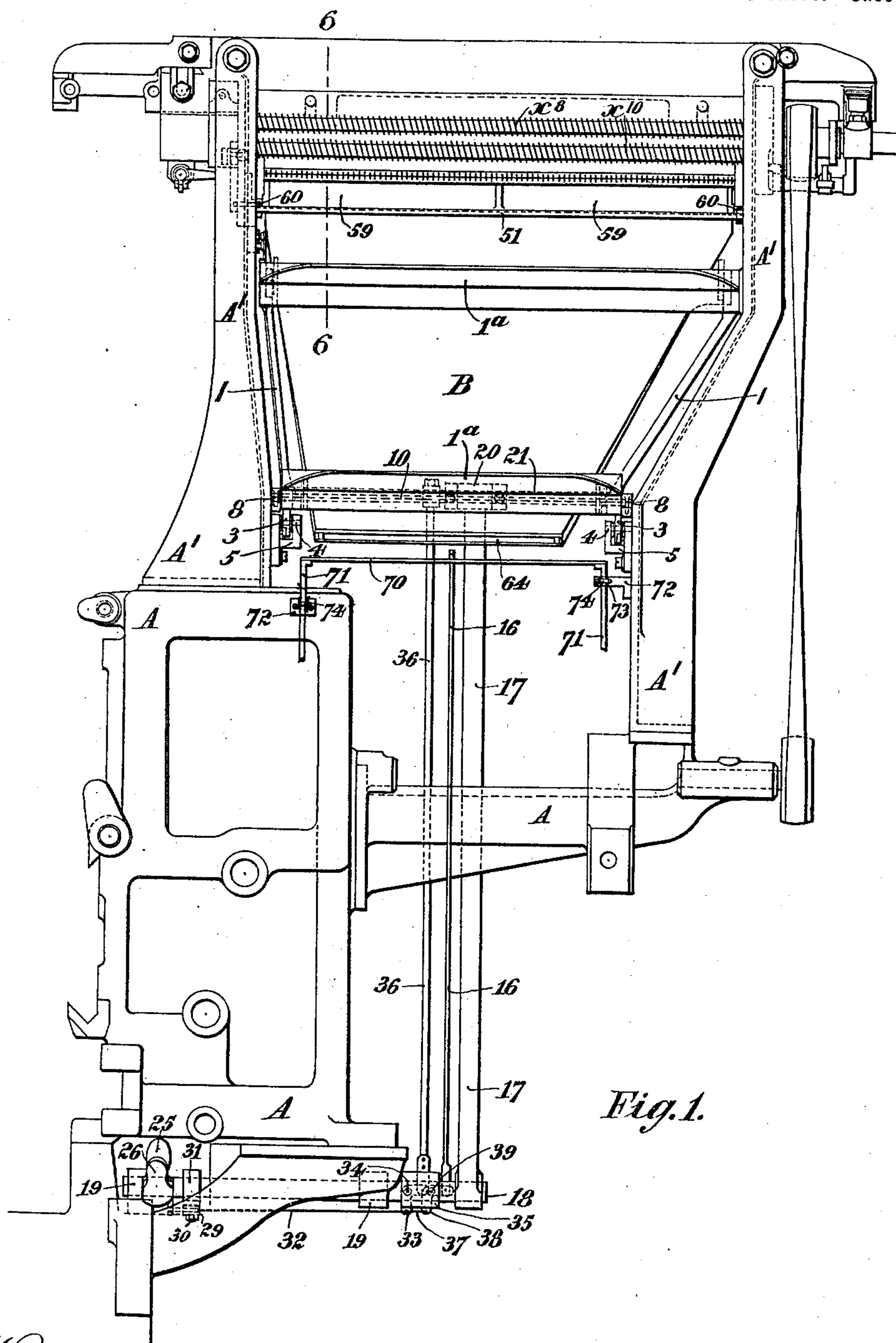
Patented Dec. 3, 1901.

F. J. WICH.
LINOTYPE MACHINE.

(Application filed Aug. 8, 1900.)

(No Model.)

7 Sheets—Sheet 1.



Witnesses.
A. M. E. Kennedy
J. S. Elmore

Inventor
Ferdinand John Wick
per P. T. Sledge
Attorney.

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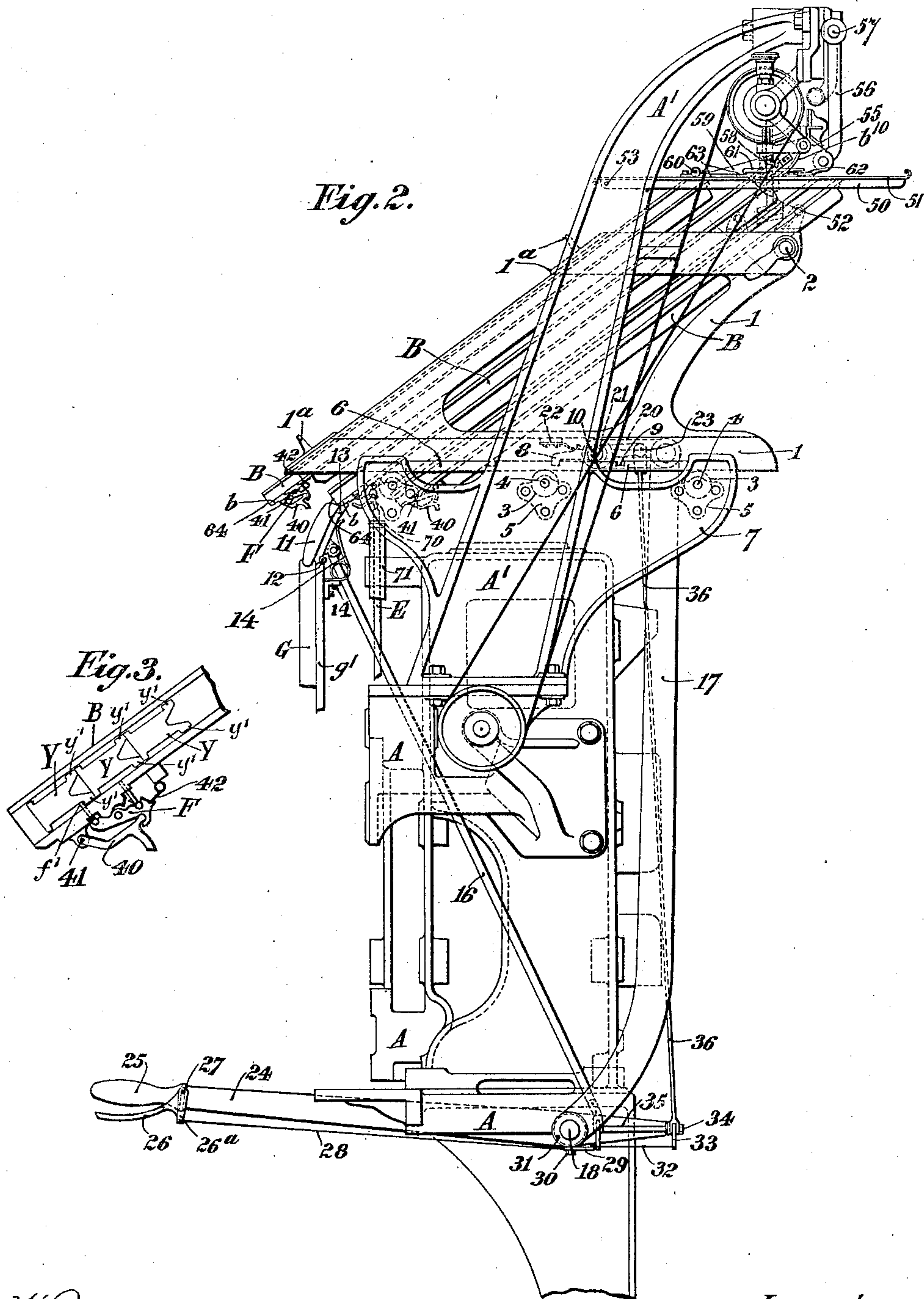
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am. e. Kennedy

J. A. Elmore

Inventor

Ferdinand John Wick

per P. T. Dodge
Attorney.

No. 688,218.

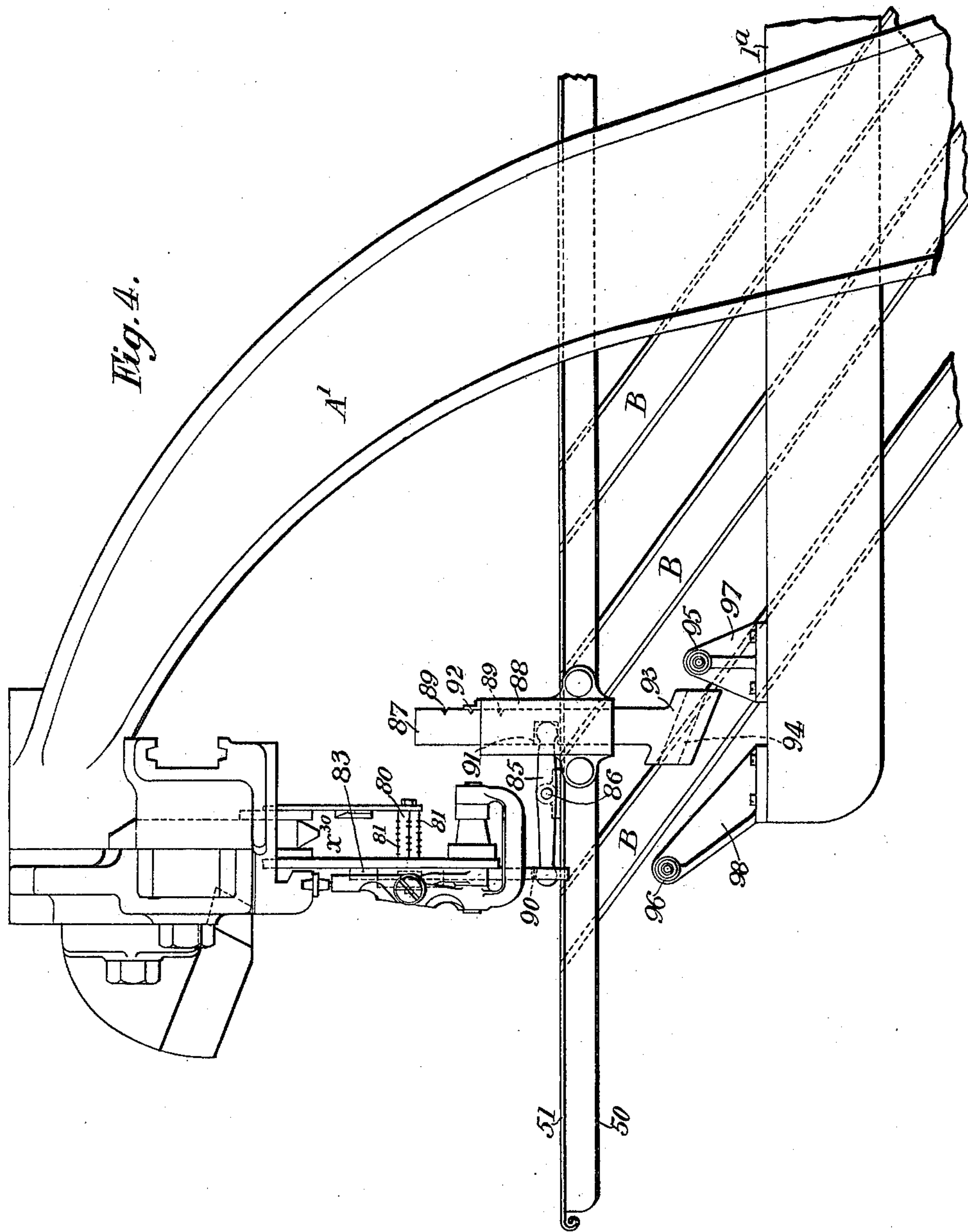
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(No Model.)

7 Sheets—Sheet 3.



Witnesses.
a. u. e. Kennedy.
A. J. C. Emore

Inventor
Ferdinand John Wich
per *P. T. Dodge*
Attorney.

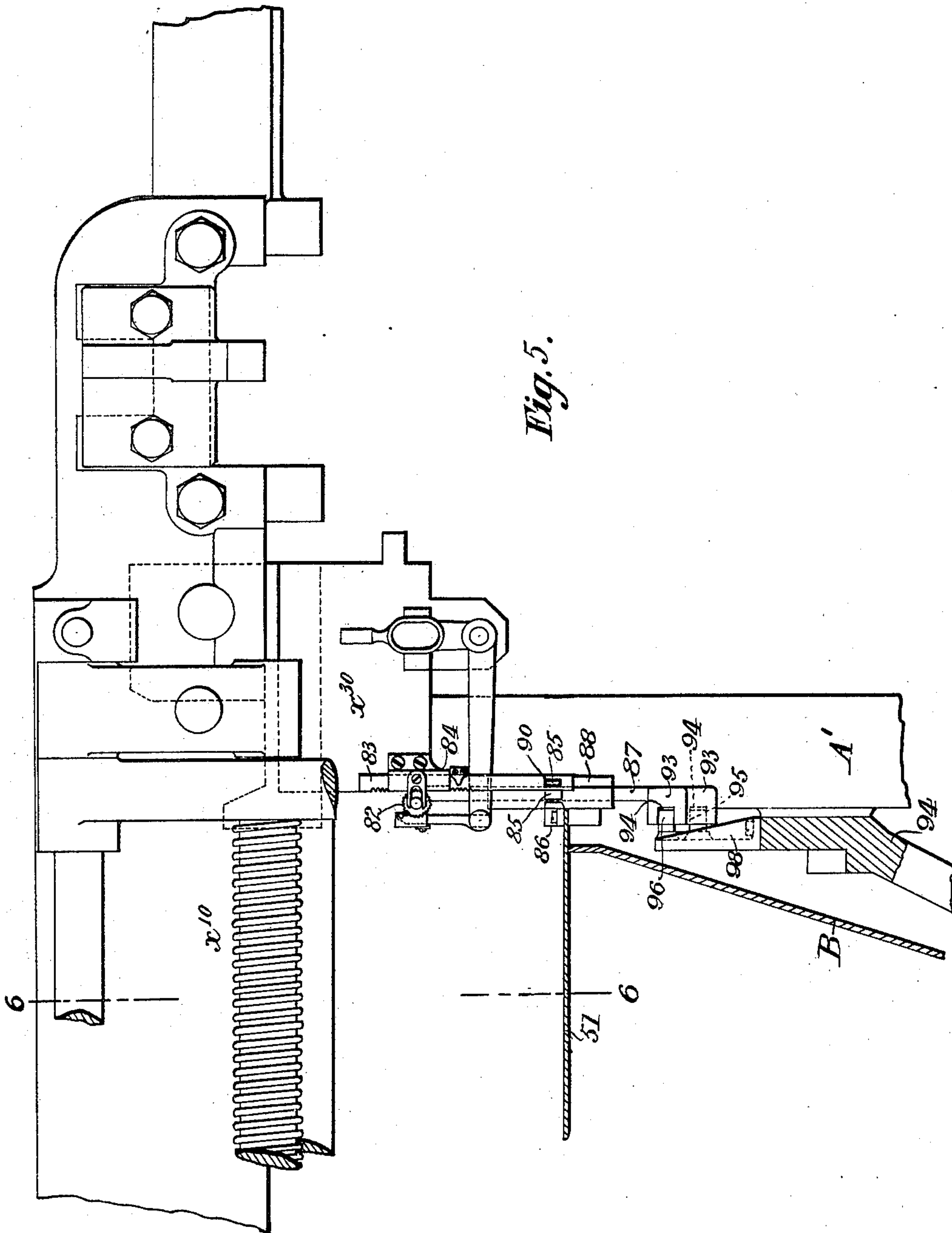
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7 Sheets—Sheet 4.



Witnesses.
a. m. e. Kennedy.
J. J. Elmore

Inventor
Ferdinand John Wich.
per P. T. Sodge
Attorney.

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(Application filed Aug. 8, 1900.)

(No Model.)

7 Sheets—Sheet 5.

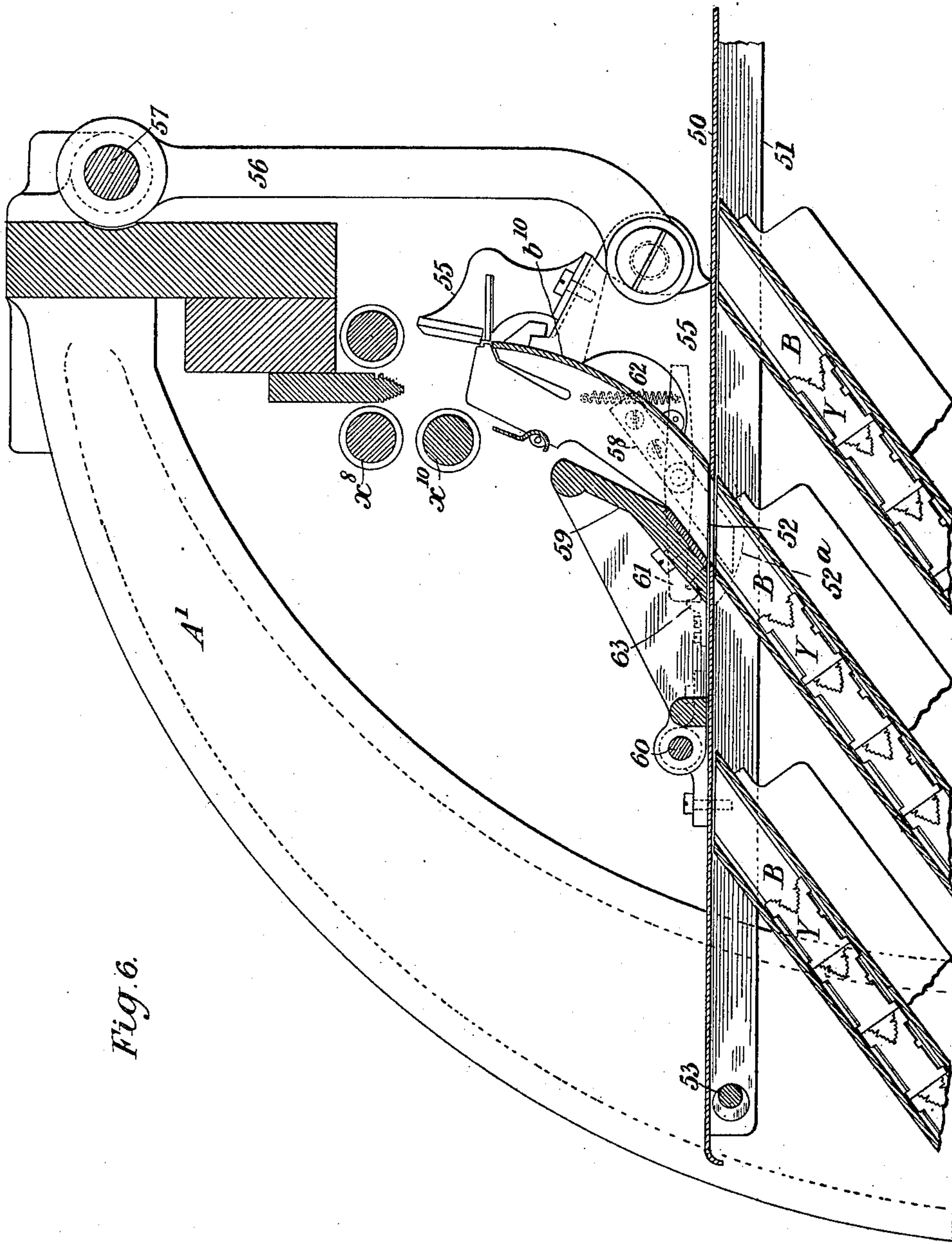


Fig. 6.

Witnesses,
N. R. Kennedy
J. S. Elmore

Inventor
F. J. Wich
per J. P. T. Dodge
Attorney.

No. 688,218.

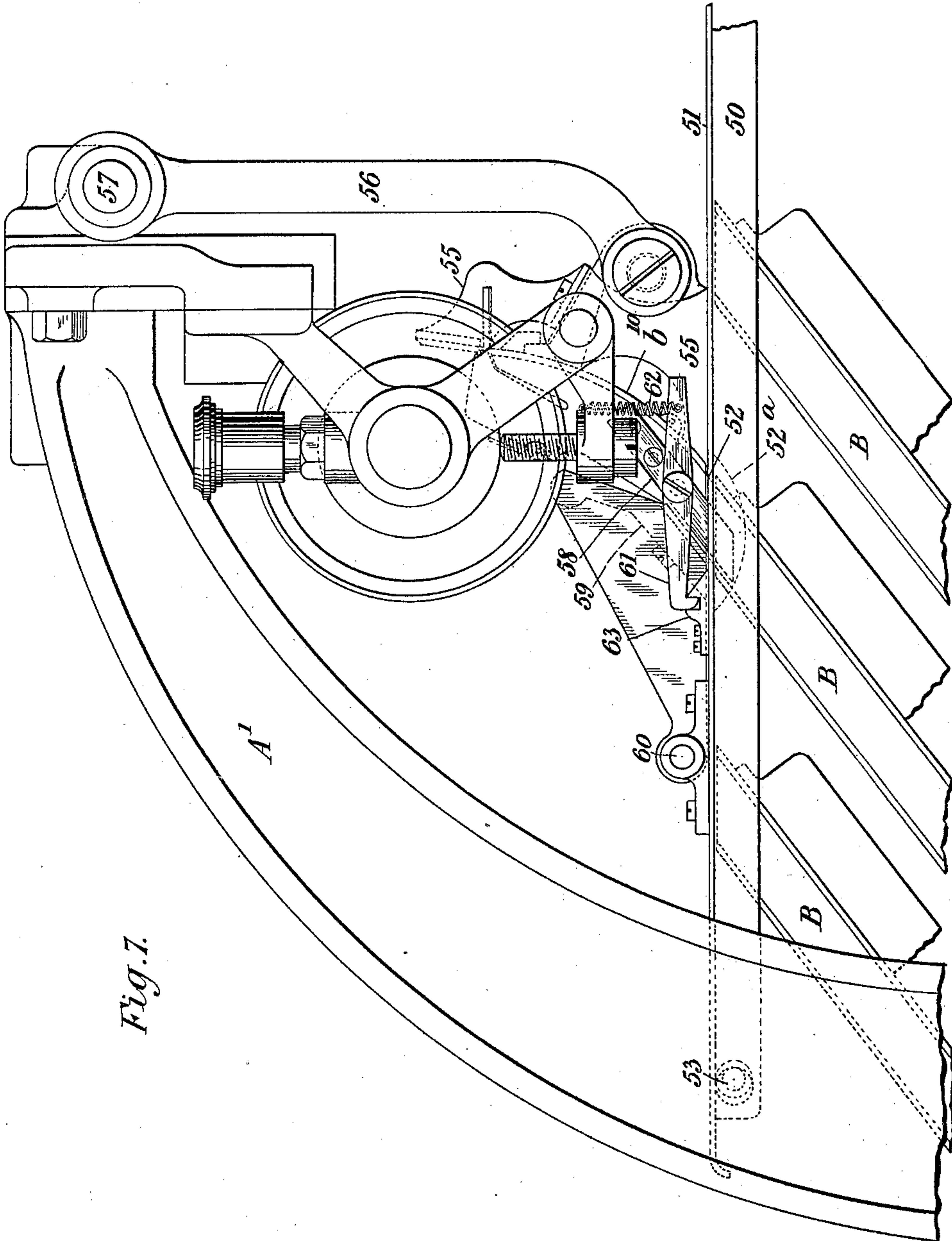
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F. J. WICH.
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(Application filed Aug. 8, 1900.)

(No Model.)

7 Sheets—Sheet 6.



Witnesses
N. R. Hennaf.
G. S. Elmore

Inventor
F. J. Wich
per P. T. Salge
Attorney.

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7 Sheets—Sheet 7.

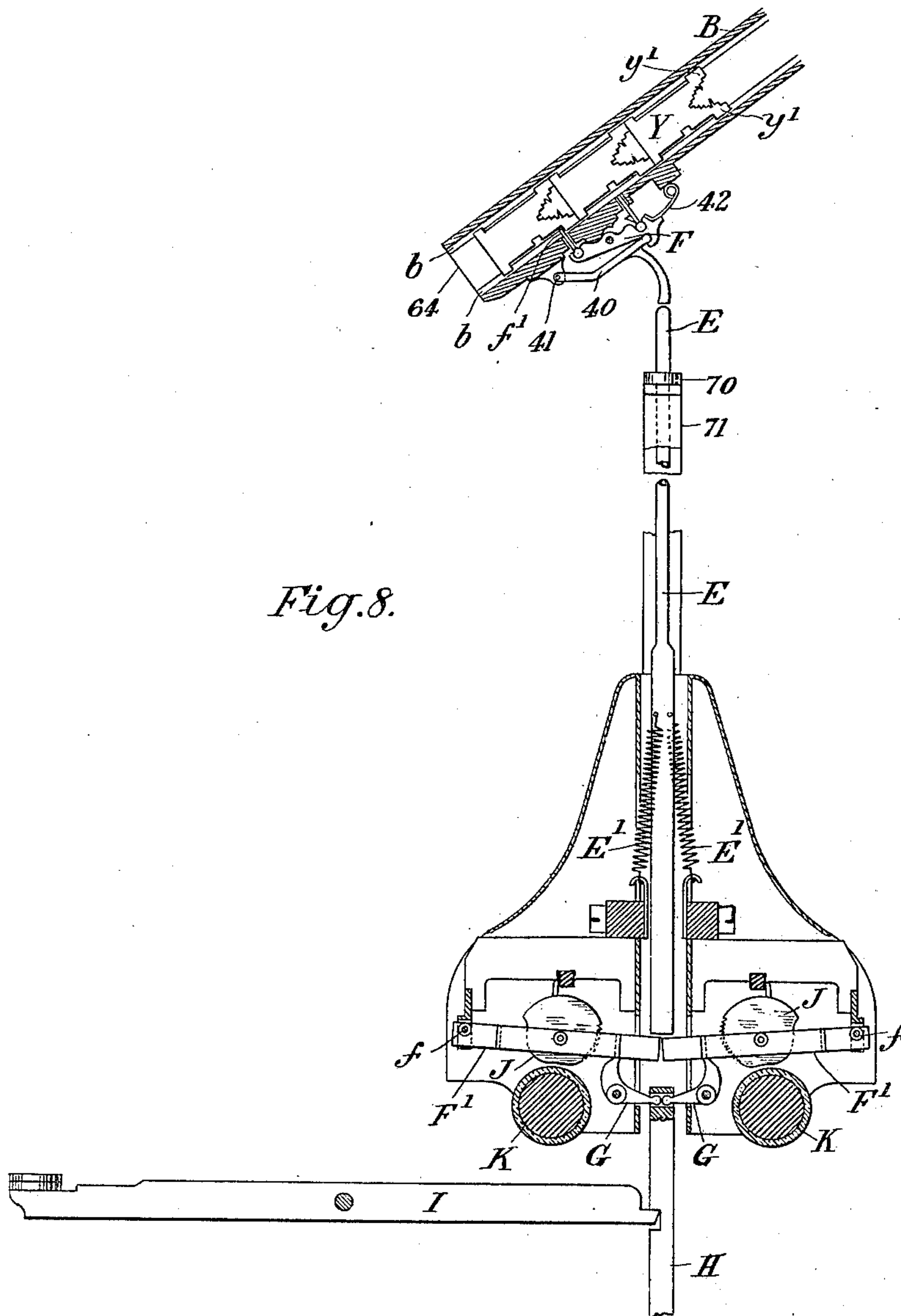


Fig. 8.

Witnesses
H. R. Kenner
F. J. Elmore

Inventor
F. J. Wich
per C. T. Dodge
Attorney.

UNITED STATES PATENT OFFICE.

FERDINAND JOHN WICH, OF BROADHEATH, ENGLAND, ASSIGNOR TO THE
MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y.

LINOTYPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 688,218, dated December 3, 1901.

Application filed August 8, 1900. Serial No. 26,288. (No model.)

To all whom it may concern:

Be it known that I, FERDINAND JOHN WICH, residing at Broadheath, in the county of Chester, England, have invented certain new and useful Improvements in 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 magazine equipment and escapement mechanism of linotype-machines, and is more particularly applicable to the linotype-machine described in the specification of Letters Patent No. 436,532, dated September 16, 1890, and now well known as the "Mergenthaler" linotype-machine.

The magazine of a linotype-machine is the reservoir in which are stored the matrices, sorted therein in separate compartments according to their respective characters, and from which the necessary matrices are delivered and composed into a line to constitute the mold of the printing edge of the linotype. The magazine of the Mergenthaler linotype-machine consists of a pair of plates held at a definite distance apart and grooved down their opposite faces to receive the matrices, each pair of opposite grooves constituting one of the separate compartments above mentioned. It is supported by the machine-frame in an inclined position, the matrices traveling through it by gravity from the upper end or entrance, into which they drop from the distributor, down to the mouths through which they drop on their way to the assembly-box.

The specification of British Letters Patent No. 23,940, dated December 12, 1893, describes a method of equipping a Mergenthaler linotype-machine with a series of magazines superimposed one upon the other and braced together, so that they constitute jointly a multiple magazine, each magazine of the series containing a distinct font of matrices, the series being capable of a vertical motion in either direction to make the magazine containing the desiderated font register at its respective ends with the magazine-entrance and row of delivery-mouths, both entrance and row of mouths being fixed. According to the way in which

the said method is to be carried into effect there are cut off from the magazine a portion across its top, which portion is incorporated with the magazine-entrance, and a portion across the bottom, which latter portion constitutes the fixed row of mouths above mentioned. This double cutting off has obviously the effect of limiting the capacity of the magazine and is a serious drawback to its usefulness.

One object of the present invention is to equip a Mergenthaler linotype-machine with a multiple magazine comprising a series of magazines each of which shall be of the normal capacity and to combine with such multiple magazine a mechanism for moving it horizontally in either direction to make the individual magazine containing the desiderated font register with the magazine-entrance and with the paths of the matrices to the assembly-box.

The invention also includes the combination, with the series of magazines and the distributor, of an automatic font-distinguisher to prevent matrices of one font being distributed into the magazine appropriated by matrices of a different font.

Referring to the accompanying drawings, which are to be taken as part of this specification and read therewith, Figure 1 is a front elevation of the upper part of a linotype-machine with my improvement incorporated therein; Fig. 2, a side elevation of Fig. 1 from the right hand, and Fig. 3 is a side elevation of the lower end of one of the magazines with the escapement for releasing the matrices one at a time therefrom; Fig. 4, a side elevation, on an enlarged scale, of the top part of Figs. 1 and 2 from the left hand; and Fig. 5, a rear elevation, partly in section and also on an enlarged scale, of the left-hand portion of the said top part. Fig. 6 is a vertical section on the correspondingly-numbered line of Figs. 1 and 5. Fig. 7 is a side elevation illustrating the parts appearing at the top of Fig. 2, but on a larger scale. Fig. 8 is a vertical section from front to rear through the lower end of one of the magazine-sections and the finger-key mechanism coöperating therewith.

A A is the frame of the linotype-machine.
B B B are three connected magazines, each

consisting, as usual, of two parallel plates having their opposing faces grooved to receive and guide the edges of the matrices seated between them. This number may be varied
 5 as may be desired; but whatever may be the number of magazines that number constitutes the multiple magazine above mentioned. They are all carried on a magazine-carriage consisting of side frames 1 1, tied together
 10 by cross-bars 1^a 1^a and a tie-rod 2. They are parallel with each other and stand at the same angle with the horizon as heretofore. The magazine-carriage is capable of a horizontal motion to and from the front of the machine
 15 and under the control of the operator to make the particular magazine B which contains the required font of matrices register with the magazine-entrance or chute, through which the matrices drop from the well-known dis-
 20 tributer-screws $x^8 x^{10}$, as well as with the well-known series of channels G. Fig. 2 shows the middle magazine B so registering. Each side frame 1 of the magazine-carriage therefore rests upon a set of antifriction-rollers
 25 3, carried on horizontal axes 4, turning in brackets 5, fast to each magazine-supporting bracket A'.

6 is a horizontal strip fast to the inside face of each vertical side A' of the machine-frame,
 30 and 7 is a rearward extension of each bracket A' to serve as a guide for the magazine-carriage. This carriage is locked in the desired registering position by the engagement of catches 8 (one on each side of the machine)
 35 in notches 9 (one for each magazine B in the series) in the top edge of the strips 6. Each catch 8 is pivoted at 10 on the respective side frame 1 of the magazine-carriage and has its own actuating-spring 22.
 40 23 is a rod extending transversely of the machine from the rear end of one catch 8 to the rear end of the other catch to make them work together.

For the reason that the registering motion
 45 of the magazine-carriage is horizontal the upper ends or mouths of the magazines, into which the matrices drop from the magazine-entrance, already mentioned, are horizontal too, and all stand in the same plane as shown
 50 in Fig. 1.

50 is a flat stationary plate carried by two transverse bars 51, one connected to each side frame A of the machine.

52 is a horizontal slot in the plate registering with the magazine-entrance and of the
 55 same area to pass the matrices into the magazine B then registering with it.

The plate 50 is stationary, and the horizontal mouths of the magazines B touch it; but
 60 to provide for an exact adjustment of the slot 52 with the registering position of the magazine as well as with the magazine-entrance it is preferred that the connection between it and the bracket A' should be by means of eccentric screws 53 or screw-and-slot devices
 65 capable of allowing the plate 50 to be moved a little to either front or rear or to allow its

front edge to be lifted a little to give access to a matrix which may accidentally have stuck between the said plate 50 and the magazine. 70
 The presence of the plate 50 necessitates the following modifications in the two plates which form the magazine-entrance. (See Figs. 2 and 6.) The back plate b^{10} has heretofore
 75 been hinged by its bottom edge to the top of the bottom plate of the magazine. According to the present invention a bracket 55, fast on each end of it, is pivoted on the bottom end of a link 56, the top end of which is pivoted
 80 by 57 to the machine-frame.

58 is a plate fast on each end of the plate b^{10} and long enough to enter the slot 52, fitting therein close up to the inner face of the
 85 respective bar 51 to hold the plate b^{10} steady in its working position. The front plate 59 is pivoted by its front edge on a horizontal pivot 60, extending across the plate 50, and is held in working position by catches 61, piv-
 90 oted one on each of the plates 58 above mentioned and caused by a spring 62 to engage in front of a catch 63, suitably positioned for
 95 such holding on the plate 50.

The front mouths 64 of all the magazines B in the series are at the same angle with the
 100 horizontal as heretofore and are on the same horizontal level, as shown in Fig. 2.

11 is the usual guide from the mouths 64 of the magazine in action to the usual ver-
 105 tical channels G. For the purpose of the present invention it is pivoted by its bottom edge along the top of the plate g' by a pivot 12.

13 is a lip along the guide 11 to engage behind the front edge of the bottom plate of
 110 the magazine in register, and 14 is a spring working from a base 15 in the back of the plate g' to keep the said lip 13 in engagement and the pivoted guide 11 in working position.

17 is a rocking arm fast by its bottom end to the horizontal shaft 18, turning in bearings
 115 19 19, carried by the side frames A A of the machine.

20 is a link from the top end of the arm 17 to a rod 21, extending from one side frame 1
 120 to the other of the magazine-carriage.

24 is a lever fast to the shaft 18, from which
 125 it projects to the front to present a grip 25 within reach of the operator.

26 is a bell-crank lever fulcrumed at 27 on the lever 24, its front arm extending to the
 130 front under the grip 25, but standing normally at a working distance below it, and its rear arm 26^a projecting downward, as shown in Fig. 2.

28 is a wire extending from the arm 26^a to one arm of a bell-crank lever 29, fulcrumed
 135 at 30 on a collar 31, fast on the shaft 18.

32 is a wire from the opposite arm of the bell-crank lever 29 to one arm of a bell-crank
 140 lever 33, fulcrumed at 34 on a second collar 35, likewise fast on the shaft 18.

36 is a pull-rod from the opposite arm of the bell-crank lever 33 to the rod 23, already
 145 described.

37 is a second wire from the same arm

of the bell-crank lever 29 as the wire 32. Its opposite end is connected to one arm of a bell-crank lever 38, fulcrumed at 39 on the collar 35; already mentioned, and having its opposite arm connected to the bottom end of a pull-rod 16, the top end of which is pivotally connected to the back of the guide 11.

Figs. 4 and 5 illustrate an improved multiple font-distinguisher adapted to automatically prevent the matrices properly belonging to a particular one of the magazines B of a series being distributed into any one of the others. 80 is the font-distinguisher. It is a rod of circular or polygonal cross-section, turning in bearings in the matrix-lift box x^{30} . Its periphery carries as many rows of teeth 81 or single teeth instead of rows as there are different fonts in the series of magazines B. As there are three magazines in the series illustrated, there are three rows of teeth 81 on the distinguisher 80. The teeth of one row are differently located lengthwise of the distributor from the teeth of any other row, and if the distributor carries single teeth instead of rows of teeth each single tooth is differently located on it longitudinally from any of the other teeth. This difference in location is clearly illustrated in Fig. 4. The feet of all the matrices of the same font are notched vertically to correspond with and clear the respective row of teeth or single tooth of the distributor on the same general principle as heretofore in matrix-font distinguishers for the said machine.

82 is a pinion fast on the rear end of the distinguisher 80 and gearing with a rack 83, capable of a vertical motion in either direction in a guide 84 on the rear face of the lift-box x^{30} .

85 is a lever having its fulcrum 86 in a block fast on the plate 51.

87 is a bar capable of a vertical motion in either direction in a guide 88 and having as many notches 89 in one edge of it as there are magazines B in a series. The rear end of the lever 85 engages in a slot 90 in the rack 83, the lever itself being cranked accordingly, as shown in Fig. 5, while its front end engages in a slot 91 in the bar 86.

92 is a spring-detent on the guide 87 to engage in the particular notch 88 opposite to it for the purpose of locking it, as well as the rack 83 and the font-distinguisher 80, in the corresponding position. The bottom end of the bar 87 carries a transverse piece 93, having an oblique groove 94 in it.

95 96 are two studs or rollers carried by pattern-blocks 97 98, fast on the adjacent cross-bar 1^a of the magazine-carriage, already described. The horizontal distance separating the axes of the rollers 95 96 is equal to the horizontal distance separating the centers of two adjacent magazines B of the series, and the vertical distance of the rear roller 96 above the front one 95 is the distance that the rack 83 must be moved to turn the dis-

tinguisher 80 far enough. These dimensional relationships will be distinctly understood from the following description of the way in which the improved font-distinguisher works.

As already pointed out, the figures show the middle magazine of the series in register with the magazine-entrance and the guide 11. If the operator wishes to put the rear magazine of the three in register, he grips the bell-crank lever 26 and the grip 25, thereby pressing the former up to the latter and unlocking the magazine-carriage, as well as putting the guide 11 out of the path of the delivery-mouths 64 of the magazines B. He then depresses the lever 24, thereby causing the roller 96 to enter the groove 94 and push the bar 87 up through the guide 88 until the detent 92 engages in the bottom notch 89 and the catches 8 engage in the rear pair of notches *g*. After the desired register has been effected he lets go of the lever 26, thereby locking the magazine-carriage in its new position and leaving the guide 11 to be rocked back into working position by the spring. The distinguisher 80 is at the same time moved about its axis to present the respective set of teeth 81 or tooth in the path of the matrices traveling to the matrix lift-box x^{30} . This travel of the matrices through the lift-box x^{30} , as well as the means by which that travel is effected, do not form any part of the present invention, they being as heretofore. If, on the other hand, the operator wishes to put the front magazine B in register, he unlocks the magazine-carriage in the way above described and rocks the lever 24 in the reverse direction through the proper distance. This causes the roller 95 to enter the groove 94 and pull the bar 87 down through the guide 85 until the detent 92 engages in the top notch 89, and the catches 8 engage in the front pair of notches 9, and so with any number of magazines B in the series, notches 89, and series of teeth 81 or teeth on the distinguisher 80. When the series of magazines consists of only three and there are two studs or rollers 95 96 to engage in the groove 94, as illustrated, both the said studs or rollers stand clear of the groove 94 for register of the middle magazine B, as shown in Fig. 4; but it must be distinctly understood that the two studs or rollers 95 96, one in front of and one to the rear of the bar 97, are not essential or indispensable features of the present invention, for the latter permits of and includes one stud or roller and a groove 94 of suitable length, with which the said single stud or roller may be in constant engagement.

A second object of the present invention is to improve the escapement mechanism whereby the whole of it, together with the keyboard, can be taken off the machine. F is the usual escapement to each matrix-compartment in a magazine, and E the escapement-rod to each escapement. Heretofore (see Letters Patent No. 530,931, dated December 18, 1894) each escapement-rod has

been hooked to its escapement and has been pushed up to actuate it, the escapement being fitted with a returning-spring, the action of which would if unlocked by the hooked connection between it and the respective escapement-rod let the front matrix in the respective compartment escape down the guide 11. According to the present invention, the top of an escapement-rod E rocks the respective escapement F to let the front matrix escape down the guide 11 by pushing on the respective one of a series of levers 40, fulcrumed on a rod 41, supported by the bottom plate of a magazine B. The rear end of a lever 40 engages loosely with the respective escapement by entering a slot in the bottom edge of it. It will be observed that the lower end of this lever 40 extends slightly below the end of the magazine, this arrangement permitting the series of magazines to slide horizontally over the upper ends of the actuating rods or bars E and at the same time bringing the ends of the levers 40 into operative position over the rods E. Owing to the horizontal length of the levers 40 and the limited motion which they receive, the ends resting on the bars E have but little movement in a horizontal direction, and therefore an easier and a better action is secured than if the bars E were extended upward directly to the escapements F. 42 is the returning-spring for an escapement F and lever 40. It is a light one, the weight of an escapement and its lever being so distributed as to nearly suffice to return them to their normal position after the return to the respective escapement-rod E to its normal position; but its action makes the respective escapement F keep the leading matrix Y in the respective compartment by projecting the pawl f' in front of the adjacent shoulder y' , as shown in Fig. 3. This obviates the use of the usual pokers and sliding bar to respectively lock the escapements, so as to keep the leading matrices in and disengage the hooked escapement-rods from the escapements, which have hitherto been necessary whenever it has been desirable to take the escapement and keyboard mechanism off the machine or to change font. The tops of the series of escapement-rods stand up through slots in a horizontal bar 70, as described in the last-mentioned patent. According to the present invention the bar is separate from the machine-frame A and is connected to the keyboard (not shown in the figures) by having its ends made fast to the tops of two uprights 71 71. The bottom end of each is made fast to the keyboard-base. To steady the combination of bar 70 and two uprights 71, there is a bracket 72 on each magazine-bracket A', presenting a slot 73 to the respective upright 71, which fits therein and fills it, it being locked therein by a latch 74, pivoted upon the front of the bracket 72.

65 I claim—

1. In a linotype-machine, a series of con-

nected inclined horizontally-adjustable magazines, a fixed distributor, and magazine-supports adapted to permit adjustment of the magazines in a horizontal direction. 70

2. The hereinbefore-described combination of a series of magazines capable of a horizontal motion to effect change of font; flat plate to close the top mouths of the series; and slot therein to establish communication between the magazine-entrance and the magazine in register. 75

3. The hereinbefore-described combination of series of magazines capable of a horizontal motion to effect change of font; flat plate to close the top mouths of the series; slot therein to establish communication between the magazine-entrance and the magazine in register; and the improved front and back plates of the said magazine-entrance. 80 85

4. The hereinbefore-described combination of a series of magazines capable of a horizontal motion to effect change of font and register; pivoted guide to engage with the mouths of the magazine in register; hand-lever and connections by which the operator can place any magazine in the series in register; means for rocking the said guide out of the way in time and for returning it; and means for automatically locking the series in the selected position. 90 95

5. The hereinbefore-described combination of a series of magazines capable of a horizontal motion to effect change of font and register; pivoted guide to engage with the mouths of the magazine in register; hand-lever and connection by which the operator can place any magazine in the series in register; means for rocking the said guide out of the way in time and for returning it; means for automatically locking the series in the selected position; flat plate to close the top mouths of the magazines; slot therein to establish communication between the magazine-entrance and the magazine in register; and the improved front and back plates of the said magazine-entrance. 100 105 110

6. The combination of an adjustable multiple magazine, a font-distinguisher, and mechanism for automatically adjusting the font-distinguisher to correspond with the position of the magazine. 115

7. The combination of the horizontal adjustable multiple magazine, a multiple rotary font-distinguisher, and mechanism for automatically rotating the distinguisher as the magazine is adjusted, substantially as described. 120

8. In a linotype-machine, the combination of a removable keyboard, escapement-actuating rods E mounted therein and guides for the upper ends of said rods attached to the keyboard and removable therewith, whereby the ready removal of the keyboard and rods is permitted without removing the rods therefrom. 125 130

9. In a linotype-machine, a removable key-

board-frame having attached thereto and removable therewith upright arms and a cross-guide for the upper ends of the escapement-actuating bars, whereby the entire keyboard, 5 with the series of actuating-bars, is adapted to be removed and replaced bodily at will.

10. In a linotype-machine and in combination with the stationary frame A', the removable keyboard-frame, its upright arms 71 removable therewith, the fixed guide 70 on said arms, and locking devices 74 for connecting the arms 71 to the frame.

11. In a linotype-machine, the magazine and its escapement F, in combination with an 15 operating-lever 40 underlying the escapement and adapted to be actuated by the upward pressure of an underlying rod E.

12. In a linotype-machine, a rotary font-distinguisher provided with a plurality of teeth, 20 on different sides, substantially as described and shown.

13. In a linotype-machine and in combination with a fixed overlying distributor, a multiple magazine consisting of a series of inclined 25 magazines having horizontal upper ends and a connecting frame or carriage with horizontal guides supporting said carriage in the main frame and arranged to permit horizontal adjustment of the magazine, substantially as described. 30

14. In a linotype-machine, a fixed distributor, a fixed magazine-entrance thereunder, in combination with a multiple magazine consisting of a series of connected inclined 35 magazines having horizontal upper ends and mounted for horizontal adjustment, whereby the mouth of either magazine may be brought into operative relation to the magazine-entrance.

40 15. In a linotype-machine, a distributor, a magazine-entrance thereunder, having a horizontal lower end, in combination with a series of connected inclined magazines having horizontal upper ends, and supporting devices

adapted to permit horizontal adjustment of 45 the magazine.

16. In a linotype-machine, the combination of a fixed distributor, a series of connected inclined magazines, each provided with escapement devices at the lower end, supporting- 50 guides adapted to permit horizontal adjustment of the magazines that either one may be brought in position to receive matrices from the distributor at will, and bars E mounted in fixed guides to cooperate with the escape- 55 ments of that magazine which is for the time being in operative relation to the distributor.

17. In a linotype-machine, the combination of a series of inclined magazines B, a supporting frame or carriage connecting them, said 60 carriage mounted on rollers to move horizontally, and a movable matrix-guide arranged to connect with the lower ends of the respective magazines as they are brought successively into operative position. 65

18. In a linotype-machine, the combination of a fixed distributor for delivering the matrices thereto, a multiple magazine mounted for horizontal adjustment beneath the distributor, and matrix-guides having a fixed operative position below the magazines, whereby, 70 without raising or lowering the magazine, either one of its sections may be brought into operative relation to the distributor and the receiving-guides. 75

19. In a linotype-machine, the combination of a font-distinguisher, a movable magazine, and intermediate devices through which the adjustment of the magazine causes an appropriate adjustment of the distinguisher. 80

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FERDINAND JOHN WICH.

Witnesses:

JOHN HENRY JOY,
JOSEPH BARRATT.