H. M. WEBSTER.

TYPOGRAPHICAL COMPOSING MACHINE.

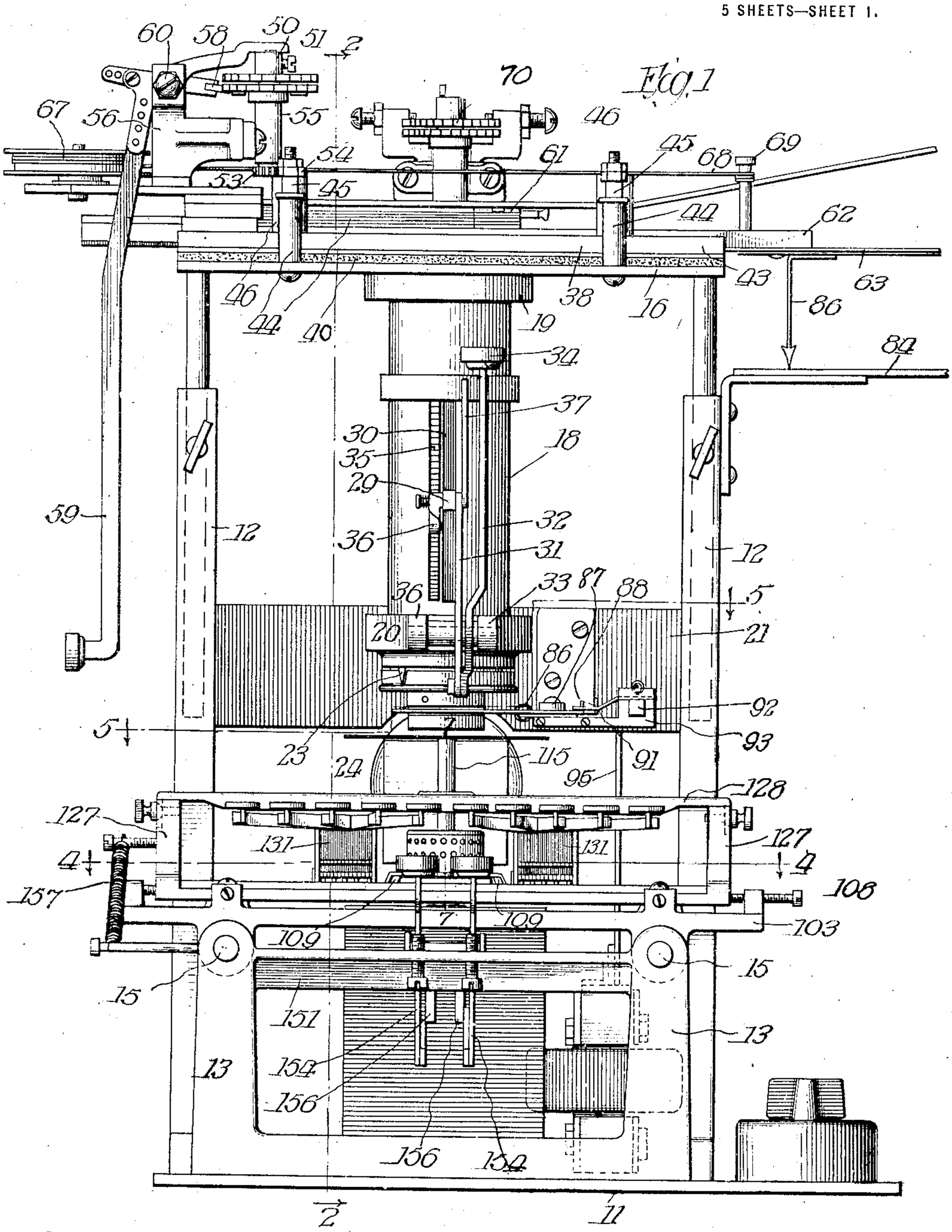
APPLICATION FILED FEB. 3, 1912.

1,166,504.

Patented Jan. 4, 1916.

5 SHEETS—SHEET 1.

Fig. 1



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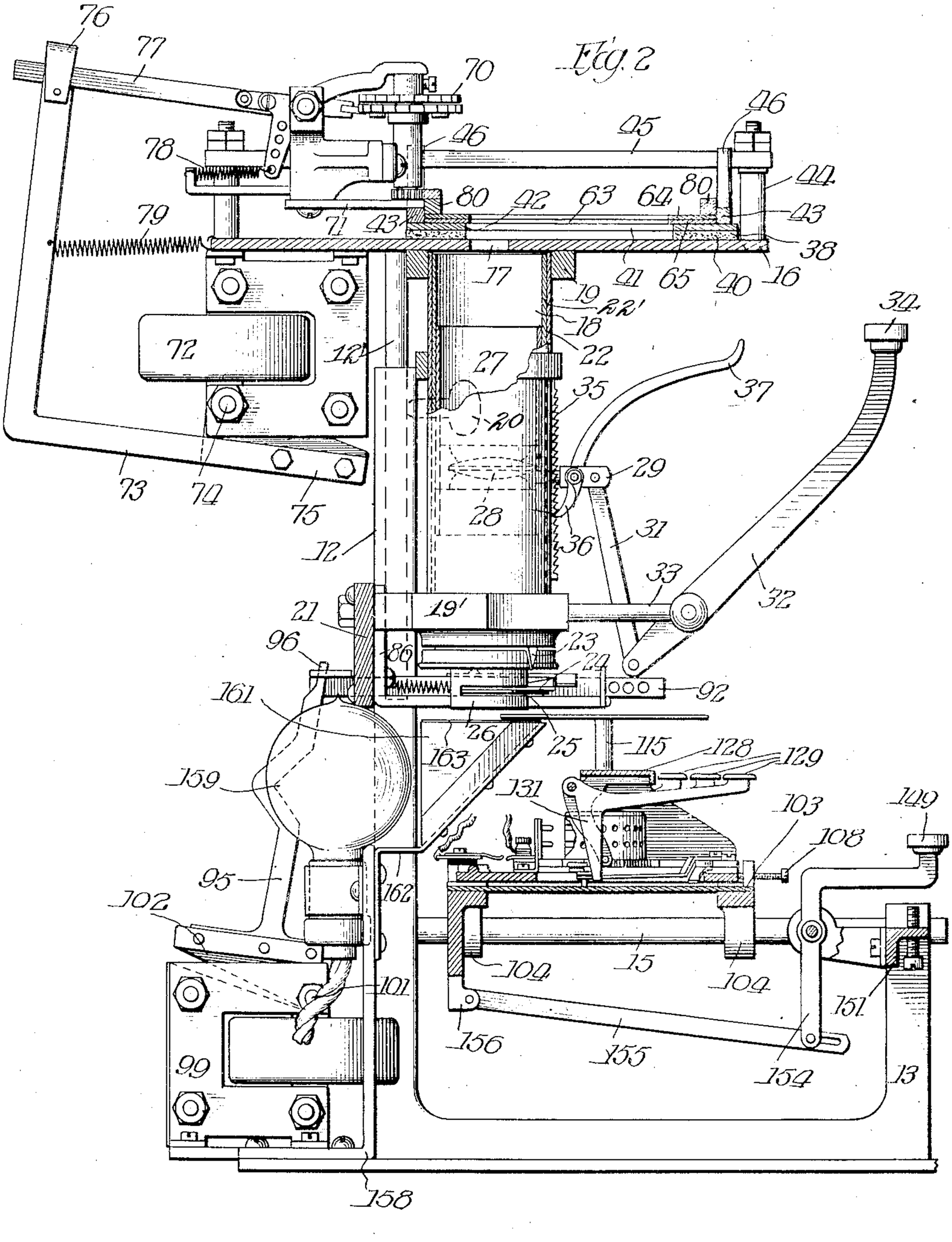
5 SHEETS—SHEET 2.

Fig. 2



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5 SHEETS—SHEET 3.

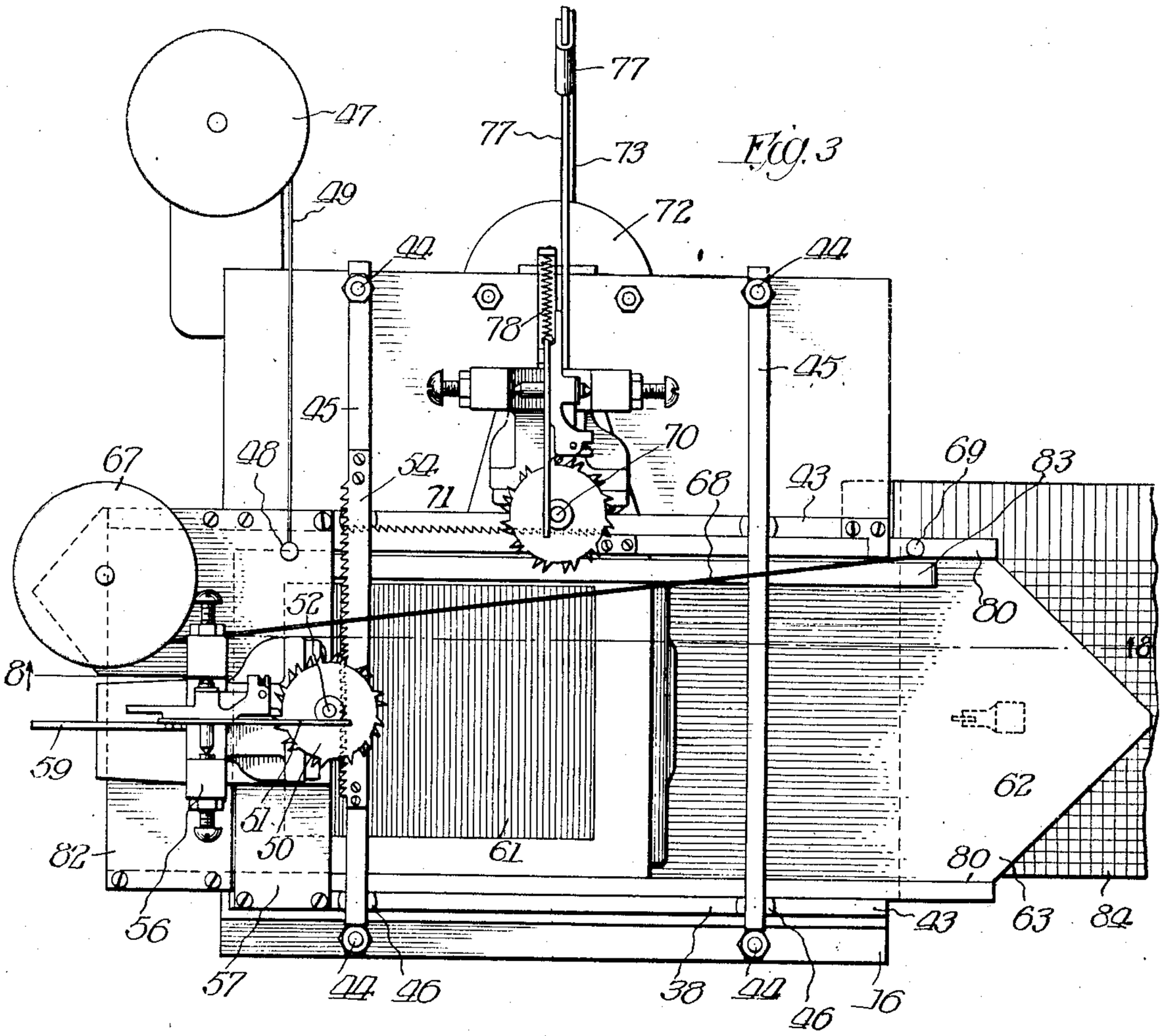

Fig. 3

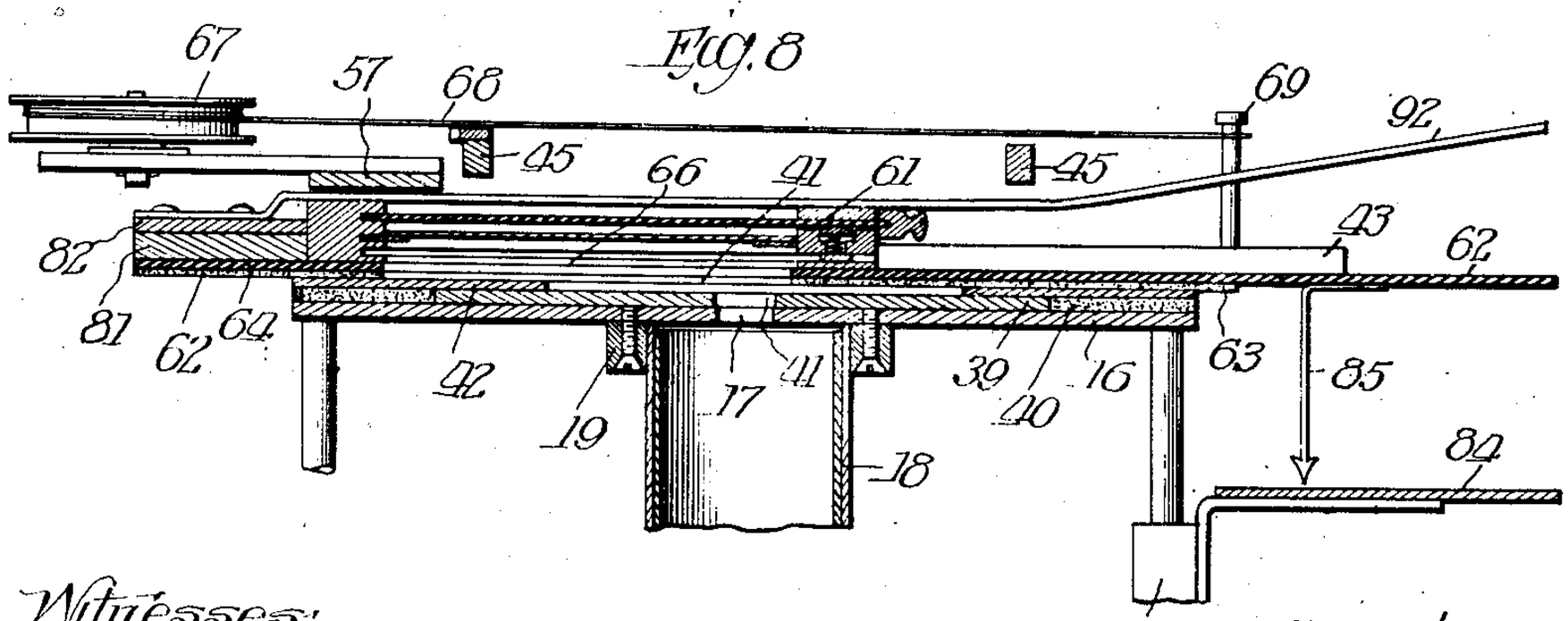

Fig. 8

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5 SHEETS—SHEET 4.

Fig 4

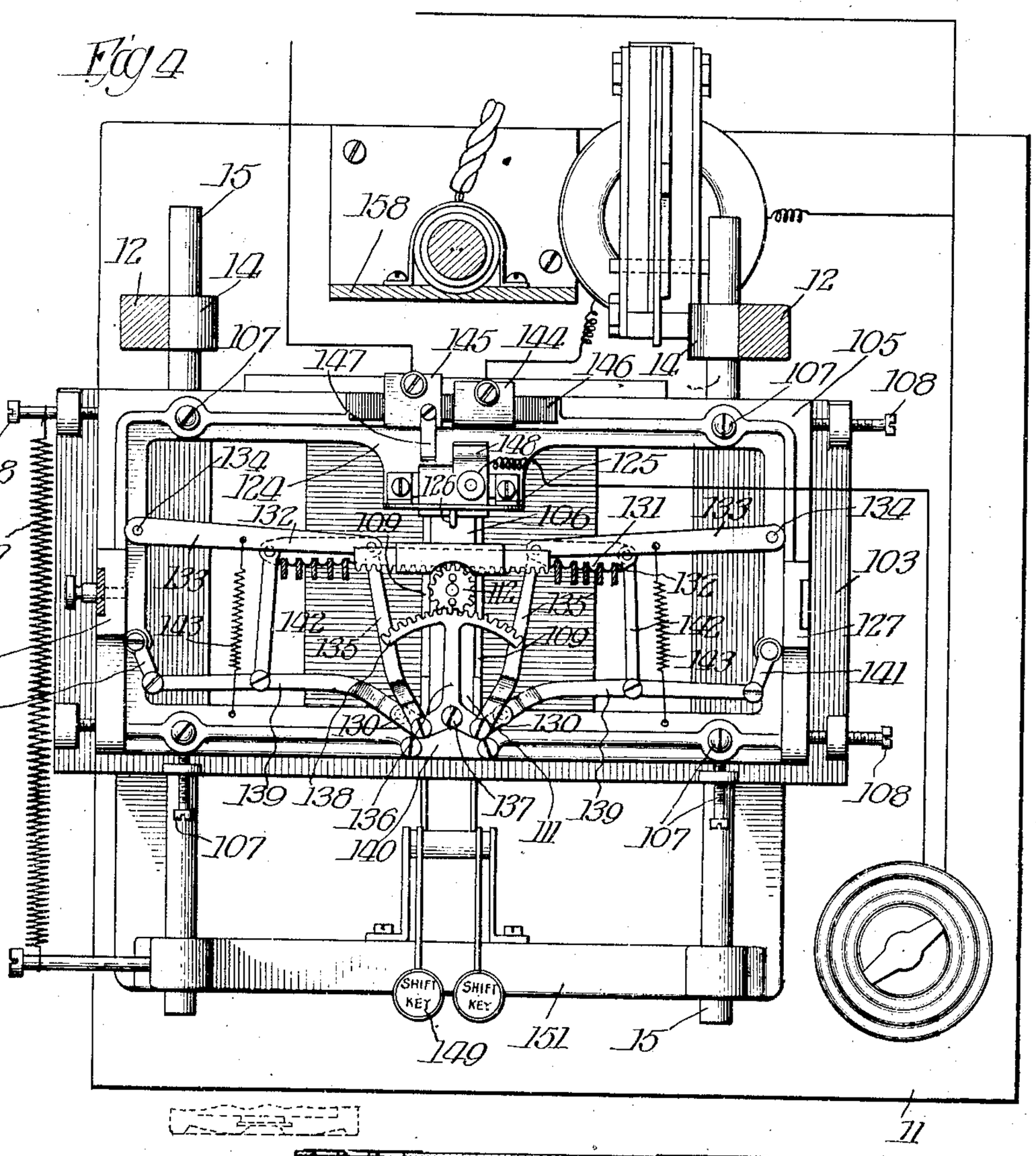
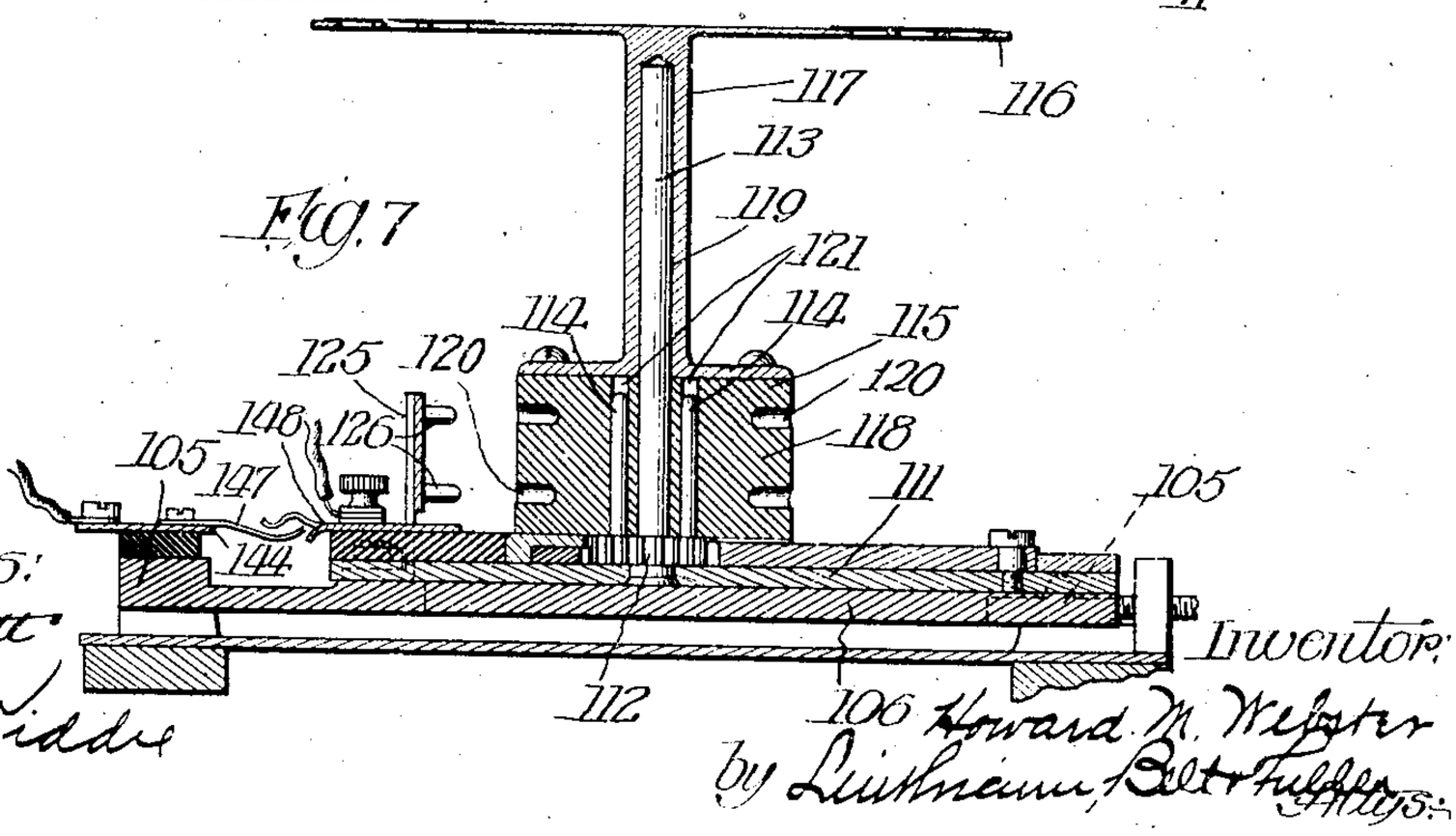


Fig. 7



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TYPOGRAPHICAL COMPOSING MACHINE.

APPLICATION FILED FEB. 3, 1912.

1,166,504.

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5 SHEETS—SHEET 5.

Fig. 5

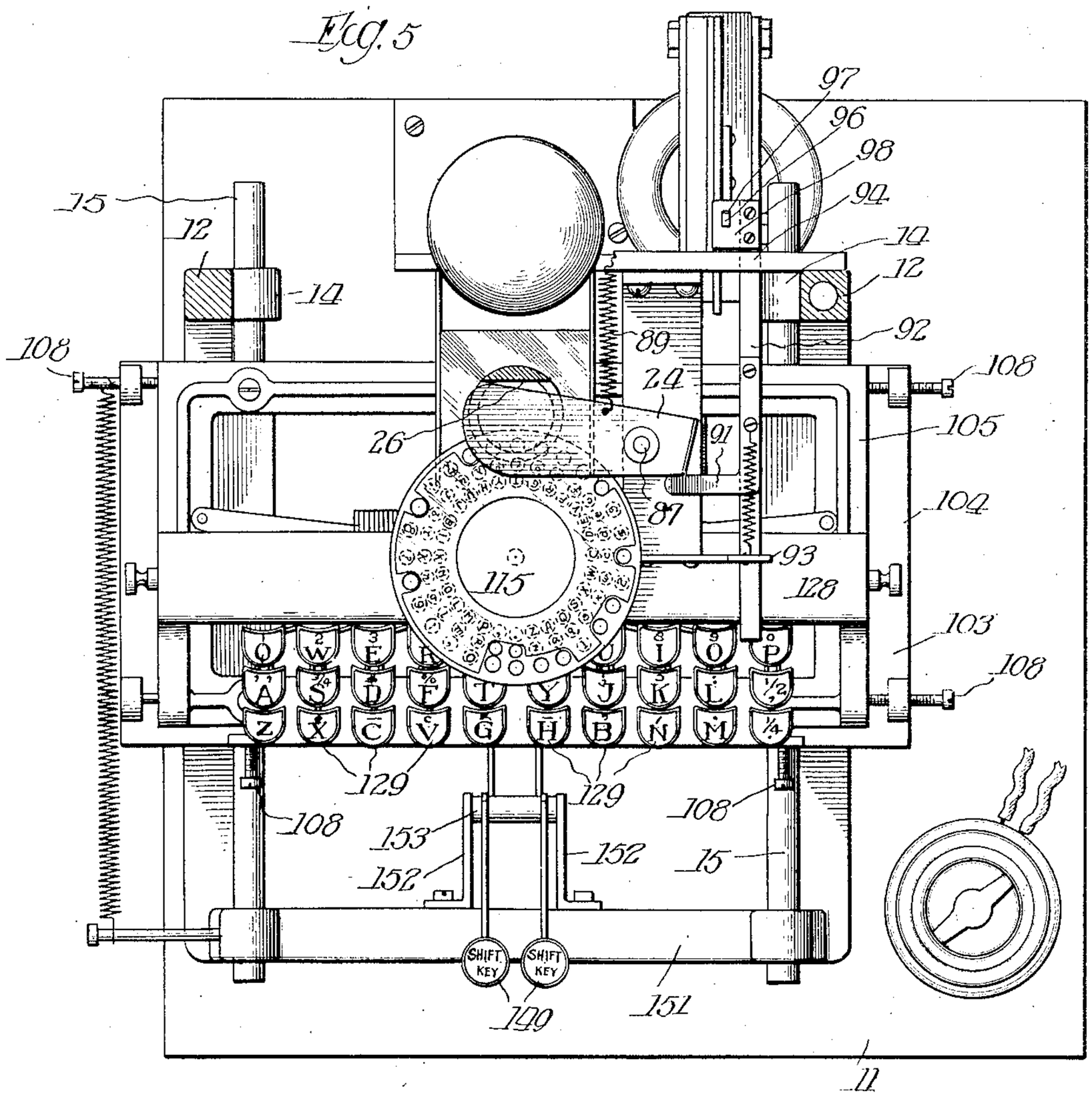
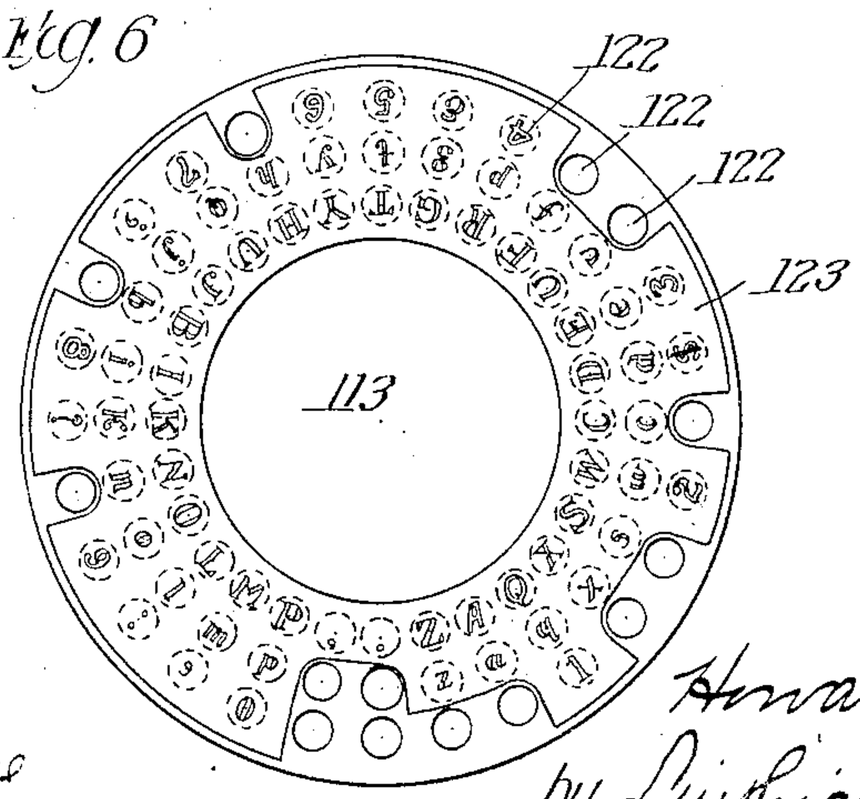


Fig. 6



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UNITED STATES PATENT OFFICE.

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TYPOGRAPHICAL COMPOSING-MACHINE.

1,166,504. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed February 3, 1912. Serial No. 675,128.

To all whom it may concern:

Be it known that I, HOWARD M. WEBSTER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Typographical Composing-Machines, of which the following is a specification.

My invention relates in general to typographical composing machines and aims to produce a typographical composing machine operated by means of a keyboard which will successively expose portions of a sensitized sheet of suitable material to receive a succession of photographs of characters positioned singly before the lens of the camera by operating the keyboard.

One of the principal advantages of a typographical composing machine made in pursuance of my invention is found in its use in connection with the making of lantern slides intended to throw printed or written sentences or notices upon a screen. To make slides for this purpose it has heretofore been customary to either first write or print upon a sheet of paper the notices or sentences to be displayed and to photograph such sheet in proper size to form the slide, or to scratch a non-transparent coating upon the slide itself to permit the light from the lantern to pass therethrough, showing upon a screen the characters thus scratched. Where the former method has been employed to produce these slides, an elaborate plant has been required, it being necessary to provide, in addition to a camera a typewriter to prepare the printed sheet, a reducing device to reduce the impression of the sheet upon the slide and suitable stands or means for retaining the sheet in proper position before the reducing camera to permit it to be photographed. In photographing a sheet of paper which has been printed or written upon it is extremely difficult to obtain a brilliant picture and the impression of the characters upon the slide is generally pale and dull, showing a lack of contrast, due to the fact that a photograph of the sheet as well as of the characters must of necessity be made, which when thrown upon the screen produces a gray, muddy background and frequently displays imperfections and peculiarities of the paper upon which the characters were originally printed. Where the surface of the slide itself is scratched to permit characters to be thrown upon a screen, the enlargement of the slide magnifies the multitudinous irregularities necessarily attendant upon the use of this method and makes them stand out prominently.

A principal aim of my invention is to produce a device for photographically impressing upon a sensitized sheet of any desired material, the ordinary photographic film or plate being preferably employed, a series of characters of any desired form, in any desired arrangement, by operating a keyboard in conjunction with the camera, automatically disposing the characters singly in position to be photographed upon the said sheet, automatically exposing a portion of the sheet to receive the likeness of each character and automatically positioning and exposing succeeding portions to receive the likeness of characters successively presented to form a notice by merely operating the keys.

A further aim of my invention is to produce a device which will cause a notice, sentence or a series of sentences, numbers and the like, as well as objects of different nature to successively affect the exposed portions of a sensitized sheet to produce likenesses thereon of a desired magnitude and to provide means for varying the magnitude of the said likenesses as may be required.

A still further aim of my invention is to produce a device for the purposes hereinbefore defined that will be effective in operation, compact in form and which may be operated by one unaccustomed to the use of cameras in general or the preparing of lantern slides for this purpose in particular.

Further aims and advantages of my invention will be apparent as it is better understood from the following description, which taken in connection with the accompanying drawings forms one preferred embodiment thereof.

On the drawings:—

Figure 1 is a front elevation of a typographical composing machine made in pursuance of my invention; Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1; Fig. 3 is a top plan view of the table shown in Fig. 1, disclosing the means for moving

a holder containing a sheet of sensitized material to present succeeding portions of the sheet to the camera; Fig. 4 is a horizontal sectional view with parts removed on the line 4—4 in Fig. 1 showing the mechanisms actuated positively by the character-bearing keys. Fig. 5 is a horizontal sectional view taken along the line 5—5 in Fig. 1, Fig. 6 is an enlarged plan view of the character-bearing member. Fig. 7 is an enlarged vertical sectional view with parts removed showing the mounting of the character bearing member in detail, and Fig. 8 is a partial sectional view along the line 8—8 of Fig. 3.

On the drawings like characters of reference refer to similar parts throughout the various figures.

In the preferred embodiment of my invention hereinbefore disclosed I have provided upon a base 11 of any suitable material a supporting framework comprising a pair of uprights each consisting of two telescoping parts 12 and 12′ located adjacent the rear of the said base and a pair of shorter supporting members 13 located adjacent the front of the said base. Upon each of the lower parts of the uprights and extending inwardly therebetween is an ear 14. A guide-receiving aperture is provided through the upper extremity of the supporting members 13 and in alinement therewith through the ears 14 are provided similar apertures. Through the apertures in an ear and in an upright member upon each side of the platform are secured the guides 15 whose use will be hereinafter disclosed. To the tops of the upper parts 12′ of the uprights is attached in suitable manner a table 16 provided with an aperture 17 beneath which is positioned vertically a camera generally designated as 18. The camera comprises in the present instance an outer shell consisting of two telescoping tubes 22 and 22′ in which the lens, shutter and other operating parts are secured. The outer tube 22 is secured at its upper end to a ring 19 fastened beneath the lower surface of the table 16, and the inner tube 22′ is secured at its lower end to a ring 19′ which is attached to a horizontally disposed supporting brace 21 located intermediate of and affixed to the lower parts 12 of the rear uprights. The table is moved vertically and carries with it the outer tube 22 when the lens and the camera is adjusted vertically to vary the size of the image, as will be later explained. This vertical movement of the table is effected by sliding the upper parts 12′ of the rear uprights in the lower parts 12 and the table is held in vertically adjusted position by thumb screws 20 threaded through the lower parts in position to contact with and hold the upper parts when the table is in the desired position.

The camera is provided at its front or lower end with an aperture (not shown) adapted to be varied in diameter in the manner ordinarily employed in connection with cameras by moving the indicator 23. In front of said aperture is disposed a shutter 24 operating within the slot 25 in the member 26, which is attached to the front of the camera. The lens 28 of the camera is carried by a sleeve 27 fitting snugly within the inner tube 22 of the camera casing. Fastened to one side of the sleeve 27 and extending outwardly through alined slots 30 in the tubes 22 and 22′ is a member or arm 29. To the member 29 at its outermost extremity adapted to move the said member and the sleeve 27 carrying the lens 28 longitudinally of the casing is pivoted the link 31 which is connected at its other end to the operating lever 32 fulcrumed between the arms 33 extending from the member 20, the lever 32 being provided at its free end with an operating key 34. To retain the sleeve in desired position the rack 35 is provided upon the outer surface of the casing 22 adapted to engage with the pawl 36 pivotally mounted upon the horizontal member 29, the said pawl terminating in the releasing handle 37. The lens may be shifted by means of the mechanism just described to vary the size of the likeness produced at the rear of the camera and the table should be properly adjusted vertically to maintain the sharp outlines of the likeness.

Upon the table 16 is provided the carriage 38 adapted to be moved longitudinally of the table as will be hereinafter described. The carriage 38 comprises a base formed of a thin sheet 39 of suitable material, having a smooth true surface therebeneath to permit it to slide upon the upper surface of the table 16. The sheet 39 has disposed about its periphery a layer 40 of felt or other soft light-excluding material in thickness equal to the thickness of the sheet 39. Extending transversely of the base 39 and disposed always above the aperture 17 is provided an elongated slot 41. About the edges of the sheet 39 upon the upper surface thereof and extending over the felt is disposed the flat strip 42, preferably of metal, holding the felt 40 in position, and adapted to provide a smooth true surface upon which a frame carrying a holder containing a sheet of sensitized material may move longitudinally of the camera.

Extending throughout the length and affixed to each side of the carriage 38 is a guide member 43 whose use will be presently disclosed.

The longitudinal movement of the carriage 38 is effected and controlled in the immediately hereinafter described manner. Upon the front and rear edges of the table 16 are provided the pairs of posts 44 to each pair of which is secured in suitable manner

the guide 45, and attached to the members 43 on the carriage and extending upwardly therefrom are the bifurcated posts 46 embracing the said guides. To move the carriage normally from the front of the table to the rear, I have provided a coiled spring within a suitable housing 47 attached to the rear of the table and a flexible connection 49 attached at one end to a spool within the said housing and fastened at the other end to a pin 48 upon the carriage, the flexible connection 49 being adapted to coil about the said spool as the spring unwinds, pulling the carriage continuously toward the rear of the table. This movement is restrained and permitted to occur in equal predetermined steps by the escapement 50 consisting of the toothed wheels 51 secured to a shaft 52 which is provided at its bottom with a ratchet-wheel 53, coöperating with a rack 54 upon the guide 45. The shaft 52 is supported within a bearing 55 carried by an arm 56 mounted upon a laterally disposed member 57, the said laterally disposed member being supported by the guide members 43 and suspended therebetween above the strip 42, forming the upper surface of the base of the carriage. To the arm 56 in suitable manner to operate a finger 58, restraining the movement of the wheels 51, and attached to one end thereof, an angular lever 59 is pivotally mounted as at 60.

The carriage 38 is provided with a transversely movable frame within which is adapted to be fixedly held a holder 61 intended to contain the slide or other sensitized sheet. This frame generally designated as 62 is composed of the base portion 63 preferably formed of the upper metallic sheet 64 and the lower sheet 65 of felt, rubber or other suitable material adapted to prevent the light from entering between the sheet 64 and the strip 42 as the frame 62 moves across the carriage. The portion of the base portion 63 disposed directly beneath the sensitized sheet when the holder 61 is in place upon the frame is cut away as at 66 to permit all portions of the said sheet to be exposed directly to the aperture 17.

The frame 62 is normally positioned between the guides 43 on the carriage 38 and is movable transversely of the camera therebetween. This movement is effected by means of a spring within the housing 67 mounted upon the member 57, and a flexible connection 68 between a spool within the housing 67 and a pin 69 on the frame, the said spring serving to continuously pull the frame toward the left as is shown in Fig. 3. This movement is restrained and permitted to occur in equal steps of predetermined magnitude by means of an escapement 70, so similar in detail of construction and operation to the escapement 50 controlling the movement of the carriage as to render minute description unnecessary. This escapement 70 is mounted upon an extension 71 secured to the guide 43 on the carriage and is controlled by means of the electromagnet 72, secured beneath the table at its rear. To this end a bent lever 73 is pivotally mounted upon the magnet as at 74 and is provided at one end with an armature 75 adapted to be attracted toward the magnet when the latter is energized. At the other end of the lever is formed the collar 76 loosely embracing the escapement arm 77, the springs 78 and 79 tending to retain and return the lever and arm in normal position.

The holder 61 is retained in position upon the base portion 62 of the frame by the lateral upwardly extending strips 80 secured upon the longitudinal sides of the said frame, the said holder abutting at its rear when in position against the transverse strip 81 provided for this purpose in similar position at the left end of the frame as is shown in Fig. 8. The strips 80 and 81 are connected and secured together by means of the member 82 fastened thereupon. To compel the holder 61 to press firmly upon the base portion of the frame bringing the entire lower surface of the holder in contact with the sheet 64 I have provided the leaf spring 83 normally exerting a force downwardly directed upon the said holder when the latter is in the position shown in Fig. 1.

It is thus obvious that a holder containing a sheet of sensitized paper may be moved in predetermined steps both longitudinally and transversely of the table 16, bringing successively different portions of the sensitized sheet behind the aperture provided in the table 16 at the rear of the camera as hereinbefore described, the transverse movement of the holder serving to space the letters of a line one from another, and a longitudinal movement serving to position a new line when the one above it has been completed. To inform the operator of the exact portion of the sensitized sheet exposed to the camera I have provided the horizontal table 84 attached in a suitable manner to the upright 12 at the right of the camera. This table is graduated both longitudinally and transversely as is shown in Fig. 3, each area between the longitudinal and the transverse lines indicating the portion of the sensitized sheet exposed to the camera. A pointer 85 is attached to the under surface of the carriage 38 in proper position depending downwardly and terminating just above the table 84, the pointer 85 being positioned to indicate upon the graduated table the portion of the sensitized sheet exposed to the aperture in the table 16.

The shutter 24 is pivotally mounted upon the outwardly extending arm 86 affixed to

the transverse intermediate member 21 as at 87. The shutter is continued beyond its pivotal connection with the arm 86 to provide the upwardly extending shoulder 88, the said shoulder tapering toward the rear. To normally retain the shutter in closed position I have provided the spring 89 connecting the shutter to the member 21. To cause the shutter to be automatically opened and closed I have mounted the trip 91 upon the longitudinally slidable member 92 adapted when the said slidable member 92 is moved rearwardly to bear against the shoulder 88 causing the shutter to move out of the slot 26 in the member 27 to open the camera. As the member 92 moves farther to the rear the shutter rotating about the pivot 87 disengages with the trip 91 and through the action of the spring 89 is returned to its normal position closing the camera.

A bearing 93 for the member 92 is provided at the extremity of the outwardly extending arm 86 and an aperture 94 is provided in the member 21 in alinement with the bearing 93 to form a second bearing for the said member. The member 92 is caused to move as has been hereinbefore suggested by means of a lever 95 terminating in a finger 96 inserted within the slot 97 in a plate 98 affixed to the rearward end of the member 92. The lever 95 is actuated by means of the electromagnet 99 attached in proper position to the rear of the base 11, the armature 102 to which the lever is secured being pivotally mounted as at 101.

In order to cause the desired likeness of a character to be photographed upon a portion of the sensitized sheet by the camera hereinbefore described and to permit a succession of characters to be photographed upon a succession of such portions, I provide the following mechanism:—Upon the guides 15 is mounted a carriage 103 provided with a plurality of downwardly disposed ears 104 at each side thereof, the ears on each side having alined apertures through which the said guides are disposed. Upon the said carriage is normally disposed a rectangular skeleton framework 105 provided with a central transverse guiding member 106. The said framework is fastened to the base of the carriage by means of set screws, bolts or the like, as at 107. To permit the framework to be accurately positioned upon the said base and to aid in securing it thereto, a plurality of upwardly extending ears are provided upon the said base adapted to secure in threaded engagement a plurality of set screws 108 turnable inwardly toward the said framework.

The guiding member 106 is provided with a longitudinal rib 109 extending throughout a portion of the said member at each side thereof. Between these ribs is disposed a longitudinally movable member 111 upon which is mounted a pinion 112 rotatable thereon, the said pinion 112 being provided with an upwardly extending central pin 113 and the two upwardly extending smaller pins 114, the said pins being adapted to engage and operate a character-bearing member generally designated as 115. This member is preferably formed of a circular disk 116 mounted upon a shaft 117 and a circular drum 118 attached in suitable manner to the base of the said shaft. Extending through the base and a substantial distance into the shaft are provided an aperture 119 adapted to have disposed thereon the central pin 113 of the pinion 112 and the pair of apertures 121 extending across the drum in suitable position and of suitable size to receive the pins 114. It is thus obvious that the rotation of the pinion will cause the drum and the disk mounted thereabove to rotate therewith. The disk 116 is provided with a plurality of apertures 122 disposed in concentric circles about the said disk. This disk may be of any desired material, it only being necessary for the purposes of my invention that such material will not permit the passage of light therethrough.

Secured to the upper surface of the disk is the character-bearing sheet 123 of any suitable transparent material, the said sheet being provided with a plurality of characters preferably of alphabetical and numerical nature, although it will be understood that other characters may be used if found desirable, each of said characters being so placed as to fall over one of the hereinbefore described apertures in the member 116. All parts of the member 123 not located within the outlines of the characters should be darkened in an appropriate manner to prevent the transmission of light therethrough, producing thereby transparent characters through which light may pass upon a background of black or other non-actinic color. The drum 118 has provided around its circumferential surface two encircling rows of peg-receiving apertures 120, a pair of such apertures being provided for each character in a single circular row of characters upon the character-bearing member 116.

The rear side member of the rectangular frame is provided with the inwardly extending lateral portion 124 extending inwardly of the frame over the guiding member 106 and has affixed to its extremity in suitable fashion the upwardly extending lateral arm 125. Upon this arm and projecting in the direction of the drum are the pair of fingers 126 adapted to enter into a desired pair of apertures 119 when the drum forming a part of the character-bearing member is advanced toward the said arm as will be hereinafter described.

At the ends of the rectangular framework 105 are provided the upwardly extending members 127 upon which is removably positioned the keyboard 128 having pivoted therebeneath a plurality of character-bearing keys 129, each of said keys being provided with the downwardly extending arm 131, the keys being bent to dispose the said downwardly extending arms in close proximity as is indicated in Figs. 2 and 4, the extremities of said downwardly projecting arms being normally disposed within receiving notches in members 132. These members are each pivotally mounted at their inner end to one end of an arm 133, the said arms being pivotally mounted at their outer ends to the rectangular framework as at 134. Pivotally mounted also with the arms 133 and the members 132 upon the pins connecting the said arms and members are the links 135 having their opposite ends rotatably secured to the extremities of a bifurcated arm 136 as is shown in Fig. 4. The arm 136 is pivotally secured to the front end of the slidable member 106 as at 137 and is adapted to be rotated by movement of either arm 135. The portion of the frame normally disposed between the bifurcated portion of the arm 136 is raised as at 140 to form a cam adapted to start the member 111 toward the rear as a key is depressed by the pressure exerted thereon as the arm 136 is revolved. To the end of the arm 136 and formed integral therewith is the annular rack 138 in mesh with and adapted to operate the pinion 112. Connected to the extremities of the bifurcated arm 136 by means of the short links 130 and extending in opposite directions therefrom are secured the levers 139 which are connected at their other ends by means of the rotatable members 141 to the rectangular frame 105. The outer ends of the members 132 are connected by means of the links 142 to the levers 139, one end of each link 142 being rotatably secured at or about the middle of a lever 139. Attaching an intermediate point on the levers 133 to the front of the rectangular framework 105 are the springs 143.

Upon the rear side of the rectangular framework 105 are secured the metal plates 144 and 145, constructed preferably of copper and insulated by the member 146 of suitable non-conducting material, to which are connected by means of suitable wiring one terminal of the coils of the electro-magnets 99 and 72 respectively. Upon the plate 145 and projecting inwardly of the framework is secured a connecting member 147. The plate 145 and the member 147 are adapted to form contact with a member of suitable nature 148 secured at the rearward end of the slidable member 106 in such manner that a contact will be established first with the member 145 and subsequently with the member 144. The member 148 is connected by suitable wiring with one terminal of an outside source of electrical energy, the other terminal of the said source being connected in parallel with a terminal of each of the coils 99 and 72. It is readily seen therefore that when one of the keys 129 is depressed the key causes the drum mounted upon the pinion 112 to revolve through a desired arc to bring the corresponding character in a desired position. At the same time the key causes the drum to move rearwardly to engage the fingers 126 in the proper apertures 120, thus locking the drum and the desired character in proper fixed position with relation to the slidable member 106. Just before the drum is locked an electrical contact is made between the members 148 and 145 which occurs when the character corresponding to the key depressed is in position beneath the front of the camera. When this contact is made the electro-magnet 72 is energized, causing the finger on the arm 77 to be moved upwardly out of engagement with a tooth upon the lower toothed wheel of the escapement 70 into engagement with a tooth upon the upper ratchet, thereby slightly advancing the carriage and holding it in the said advanced position. As the said key is depressed further an electrical contact is made between the members 144 and 148 completing the circuit containing the electro-magnet 99 with the outside source of power and energizing the said magnet, causing thereby the trip 91 to open and close the shutter as has been hereinbefore described. As the said key is released these contacts are broken, the said finger moving out of engagement with a tooth upon the upper wheel into engagement with a succeeding tooth upon the lower one, advancing thereby the carriage conveying the holder 61 into position to have the hereinbefore operation repeated. As the contact is broken between the members 144 and 148 the trip 91 is returned to the front of the shoulder 88, slipping up the inclined face thereof and dropping into its normal position. The disk 116 is returned to normal position by action of the springs 143.

To provide means for permitting the characters forming the outer encircling rows upon the disk 116 to be used I have provided a shift-key 149 for each row, to properly position them in operative position and to this end there is provided between the supporting members 13 the horizontally disposed member 151 preferably formed integral with the said supporting members upon which is secured by means of the arms 152 the circular bearing 153. Upon this bearing the shift-keys 149 are rotatably mounted and are provided with the

downwardly extending arms 154 to which is secured one end of the links 155, the said links having their other ends attached to a rigid downwardly projecting member 156 located at the rear of the carriage so that when it is desired to print from one of the two outer encircling series of characters it is only necessary to press down the shift-key corresponding to said character when the entire hereinbefore described operation will take place farther from the center of the disk than when the carriage 103 is in the normal position. To return the carriage to normal position when the shift-key is released, I have provided the spring 157 having one end attached to said set screws 108 and the other affixed in suitable manner to an upright 12.

To more perfectly affect the portion of the sensitized plate exposed to the character and to more clearly bring out the details of the said character I have provided upon the base the upwardly extending member 158 to which is secured at its upper extremity an electric light 159. Secured also to the member 158 I have disposed the prism 161 having a rectangular surface presented to the said light and a similar face disposed directly beneath and in spaced apart relation from the lower end of the camera. These surfaces are connected by a rectangular surface forming 45° angles with them upon which is disposed a sheet of reflecting material adapted to reflect the horizontal rays of light produced by the lamp vertically into the lens of the camera. The prism is secured in this position by means of the arm 162 secured to the upright 158 and adapted to embrace the slanting face of the prism behind the reflecting surface. Upon the horizontal face of the said prism is disposed a non-actinic member 163 provided with an aperture located directly beneath the front of the camera to permit the said reflected ray only to enter the camera. It is manifest that a ray of light thus reflected will throw out in bold detail the transparent outlines of the character disposed in front of the camera, and cause a complete exposure of a portion of the sensitized sheet presented at the back of the camera to be effected.

While I have disclosed the characters as transparent upon a non-actinic background it will be readily recognizable that non-transparent characters upon a transparent background may be as readily employed. It will be further understood that the disk may be provided with alphabetical and numerical characters, signs, symbols, as well as various figures of standard or fanciful nature as may be desired.

It is obvious that a lantern slide adapted to display characters of any desired nature may be prepared for final development by providing the disk with the said characters and merely operating the various keys as has been hereinbefore described. It will be obvious also that various changes in the form and construction of the parts and other arrangements may be resorted to without departing from the spirit and scope of my invention, the form hereinbefore disclosed being merely one preferred embodiment thereof.

I claim:—

1. In combination with a camera, a holder adapted to contain a photographically sensitized sheet, a plurality of characters, electrically controlled means exposing a portion of a sheet within the holder to photograph a desired character, and separate electrically controlled means for presenting successive portions of the said sheet to be exposed in alinement.

2. In combination with a camera, a holder adapted to contain a sheet of sensitized material, a plurality of characters, means for directing a ray of light into the camera, means for interposing a character across said ray of light in position to be photographed by said camera, and means disposed between said character when in position to be photographed and said holder for exposing a desired portion of a sheet within the holder to photograph said character.

3. In combination with a camera, a holder adapted to contain a sheet of sensitized material, a plurality of characters, means for directing a ray of light into the camera, means for interposing a character across said ray of light in position to be photographed by said camera, means disposed between said character when in position to be photographed and said holder for exposing a desired portion of a sheet within the holder to photograph said character, and electrically controlled means for positioning successive portions of the sheet in position to be exposed.

4. In combination with a camera, a holder adapted to contain a sheet of sensitized material, a plurality of characters, a source of light, means directing a ray from the said source of light into the camera, means interposing in said ray of light a character, electrically controlled means for exposing to a portion of the sheet within the holder to photograph thereon the character exposed, and separate electrically controlled means for exposing successive portions of the said sheet.

5. In combination with a camera, a holder adapted to contain a photographically sensitized sheet, means yieldingly pulling said holder across the rear of the camera, a device for restraining movement of said holder, electrically controlled means for exposing a portion of the sheet within the holder, and separate electrically controlled means to re-

lease said restraining means, whereby said holder is forwarded a predetermined step after each exposure.

6. In combination with a camera, a holder adapted to contain a photographically sensitized sheet, means yieldingly pulling said holder across the rear of the camera, a device for restraining movement of said holder, a character bearing member, means for moving said character bearing member to present a desired character to the said camera, and an electric control for said holder restraining device adapted to release said holder and permit it to be advanced a predetermined distance before and after each exposure of the camera.

7. In combination with a camera, a holder adapted to contain a sheet of sensitized material, means for moving said holder to present successive portions of the sheet within the holder to the rear of the camera, a member having a transparent character adapted to be presented in front of the shutter and lens of the camera, and a source of light behind said transparent character to cause the light passing through said transparent character to produce a likeness of said character upon the exposed portion of said transparent sheet.

8. In combination with a camera, a holder adapted to contain a sheet of sensitized material so that successive portions of said sheet may be presented successively to the rear of the camera, a movable device provided with transparent characters, means for moving said device to present a desired character to the front of the camera, and means controlled by movement of the said device for presenting successive characters to successive portions of the sheet.

9. In combination with a camera, a holder adapted to contain a sheet of sensitized material and adapted to present successively portions of such a sheet to the rear of the camera, a movable device provided with a plurality of transparent characters, means for moving said device to present a desired character to the front of the camera, means for supplying light behind the said characters, and means controlled by movement of said device for presenting successive characters to successive portions of the sheet.

10. In combination with a camera, a holder adapted to contain a sheet of sensitized material, means for normally directing a ray of light into the camera, a movable device provided with a plurality of characters, a keyboard for controlling the movement of said device to interpose in said ray of light any desired character, and means automatically controlled by movement of said device for opening and closing said camera when the said character is in position to cause the said character to be photographed upon a sheet within the holder.

11. In combination with a camera, a holder adapted to contain a sheet of sensitized material, means for normally directing a ray of light into the camera, a movable device provided with a plurality of characters, a keyboard for controlling the movement of said device to interpose in said ray of light any desired character, means automatically opening and closing said camera when the said character is in position to cause the said character to be photographed upon a portion of a sheet within the holder, and means automatically moving the holder to present a similar portion of the sheet to the camera after the character has been photographed, both said means being automatically controlled by movement of said device.

12. In combination with a camera, a holder adapted to contain a sheet of sensitized material, a movable device provided with a plurality of characters, a plurality of keys each adapted to move said device to present a character to the camera, and means for opening and closing the camera after a character has been presented thereto to permit the character to be photographed on a sheet within the holder, said means being actuated by an electro-magnet rendered operative by the movement of said device.

13. In combination with a camera provided with a shutter, a holder adapted to contain a sheet of sensitized material, a movable device provided with a plurality of characters, keys actuating said device, an electro-magnet connected to the said shutter, and means connecting said magnet to an outside source of electrical energy adapted to be thrown into operative relation therewith by movement of said device when a key has been operated to present a character to the camera.

14. In combination with a camera having a shutter, a holder adapted to contain and to present succeeding portions of a sheet of sensitized material to the rear of the camera, a movable device provided with a plurality of characters, means moving the said holder transversely across the camera, an electro-magnet controlling said means, an electro-magnet adapted to actuate the said shutter, a plurality of keys, each of said keys being adapted to move said device to present a character to the camera, said movement of said device causing the energization of the electro-magnet actuating the means moving the said holder and energization of the electro-magnet adapted to control the shutter after the character is in place before the camera.

15. In combination with a camera, a substantially flat character-bearing member circular in form and provided with a plurality of characters arranged in concentric circle thereon, a plurality of keys adapted nor- of characters arranged in concentric circles

singly before the camera, and means permitting the said keys to dispose the characters forming other circles before the camera.

16. In combination with a camera, a character-bearing member having a plurality of characters arranged thereon in radial lines converging at a center, the said characters forming concentric circles about the said center, a plurality of keys normally operating the characters forming a single circle to present said characters singly before the camera, and means causing the said keys to position the characters forming the other circle before the camera, each key causing to be disposed before the said camera the characters disposed in a radial line as the means are operated.

17. In combination with a camera having a lens, a holder adapted to contain a sheet of sensitized material, a plurality of characters, means for directing a ray of light into the camera, means for interposing a character across said ray of light in position to be photographed by said camera, means disposed between said character when in position to be photographed and said holder for exposing a desired portion of a sheet within the holder to photograph said character, and means for moving said lens longitudinally of the camera to vary the size of the likeness upon the exposed portion of said sheet.

18. In combination with a camera having a body portion provided with a slot extending longitudinally thereof, a holder adapted to contain a sheet of sensitized material, a plurality of characters, means for directing a ray of light into the camera, means for interposing a character across said ray of light in position to be photographed by said camera, means disposed between said character when in position to be photographed and said holder for exposing a desired portion of the sheet within the holder to photograph said character, a sleeve mounted on said body portion having an ear extending through said slot, a lens carried by said sleeve, means engaging said ear for moving the sleeve and lens longitudinally of the body portion to vary the size of the image of the character produced on the sensitized sheet, and means for retaining the sleeve and lens in desired position.

19. In combination with a camera having a lens, a holder adapted to contain a sheet of sensitized material, a plurality of characters, means for directing a ray of light into the camera, means for interposing a character across said ray of light in position to be photographed by said camera, means disposed between said character when in position to be photographed and said holder for exposing a desired portion of a sheet within the holder to photograph said character, electrically controlled means for positioning successive portions of the sheets in position to be exposed, and means for moving said lens longitudinally of said camera to vary the size of the likeness upon the exposed portion of the sheet.

20. In combination, a vertically disposed camera having an opening at its upper end, a table mounted above the upper end of the camera and provided with an opening therein coincident with the opening at the upper end of the camera, a holder adapted to be moved across the said opening and to contain a sheet of sensitized material, a plurality of characters located below the camera and disposed in a common horizontal plane, means horizontally moving the characters singly in front of the camera in any desired order, means exposing a portion of a sheet within the holder to have photographed thereon each character as it is positioned before the camera, and means moving the holder across the rear of the camera to position succeeding portions.

21. In combination with a camera, a substantially flat character-bearing member provided with a plurality of characters, and means disposing successively desired characters in position to be photographed by the said camera, said characters being automatically returnable to a predetermined normal position.

22. In combination with a camera, means exposing successive portions of a sensitized sheet to the rear of a camera, a substantially flat character-bearing member provided with a plurality of characters, and means for disposing desired characters in position to be photographed by the camera as successive portions of the sheet are exposed to the rear of the camera, said characters being automatically returnable to a predetermined normal position.

23. In combination with a camera, a substantially flat character-bearing member having disposed thereon a plurality of characters disposed in concentric circles about the center of said member, and means actuating said character-bearing member to dispose a desired character in position to be photographed, said character-bearing member being automatically returnable to a predetermined normal position.

24. In combination with a camera, a rotatable character-bearing member having disposed thereon a plurality of characters, and means for rotating and moving said member in substantially a straight line to dispose a desired character in position to be photographed by the said camera, said character-bearing member being automatically returnable to a predetermined normal position.

25. In combination with a camera, a circular character-bearing member having disposed thereon a plurality of characters, and means rotating the said member and moving

it in substantially a straight line to dispose a desired character on the said member in position to be photographed by the camera, said member being automatically returnable to a predetermined normal position.

26. In combination with a camera, a circular member having a flat character-bearing surface, a track in which said character-bearing member is adapted to be moved forwardly before the camera, and means for rotating the said member and moving it in said track to dispose a desired character in position to be photographed by the said camera.

27. In combination with a camera, a character-bearing member provided with a flat character-bearing surface, a vertical spindle upon which said member is fixedly mounted, and means for simultaneously rotating said member and spindle and moving said member and spindle into position before the camera to dispose a desired character in position to be photographed by said camera.

28. In combination with a camera, a holder adapted to contain a sheet of sensitized material and to present successive portions thereof to the rear of the camera, a character-bearing member mounted to move transversely of the camera and in a plane in front of the camera and at right angles thereto, and means for rotating and moving the said member for positioning a series of desired characters in position in front of the camera to be photographed on a sheet within the holder, said member being automatically returnable to a predetermined normal position after the photographing of each character.

HOWARD M. WEBSTER.

Witnesses:
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T. D. BUTLER.