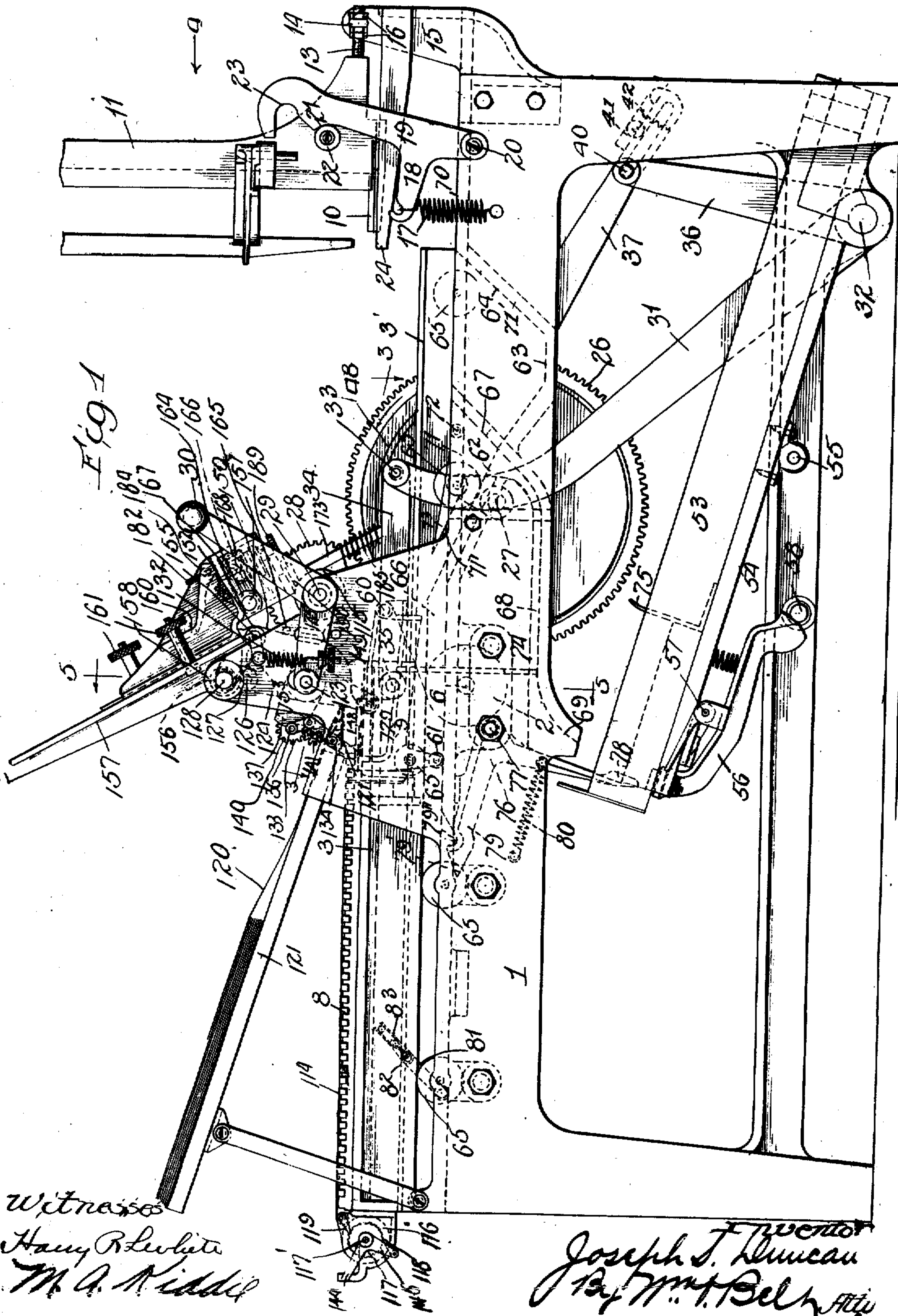


927,510.

J. S. DUNCAN.  
PRINTING MACHINE.  
APPLICATION FILED AUG. 24, 1906.

Patented July 13, 1909.

13 SHEETS—SHEET 1.



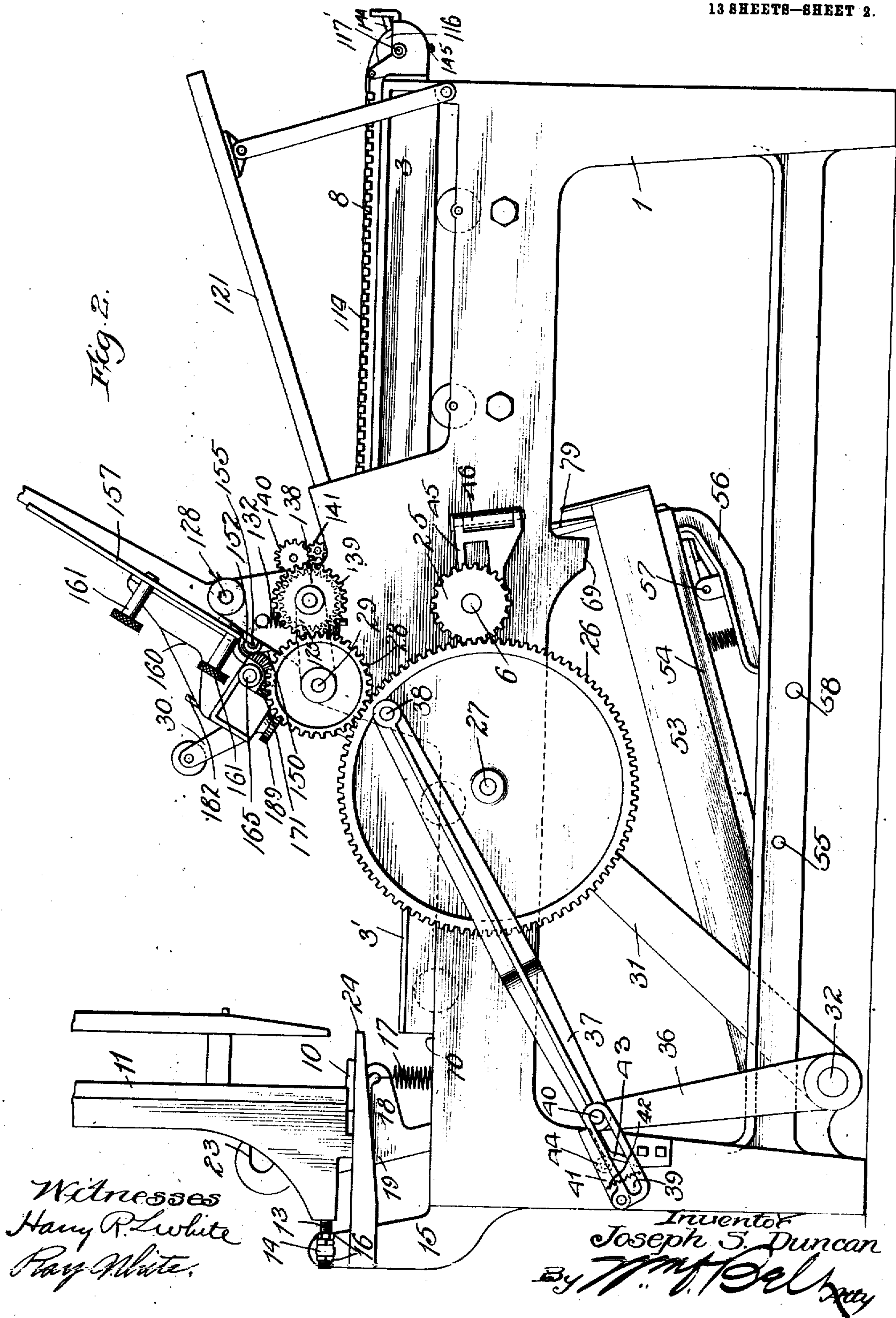
Witnesses  
Harry R. Lehigh  
M. A. Kiddle

Joseph S. Duncan  
By J. M. Belcher

927,510.

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APPLICATION FILED AUG. 24, 1908.

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13 SHEETS—SHEET 2.





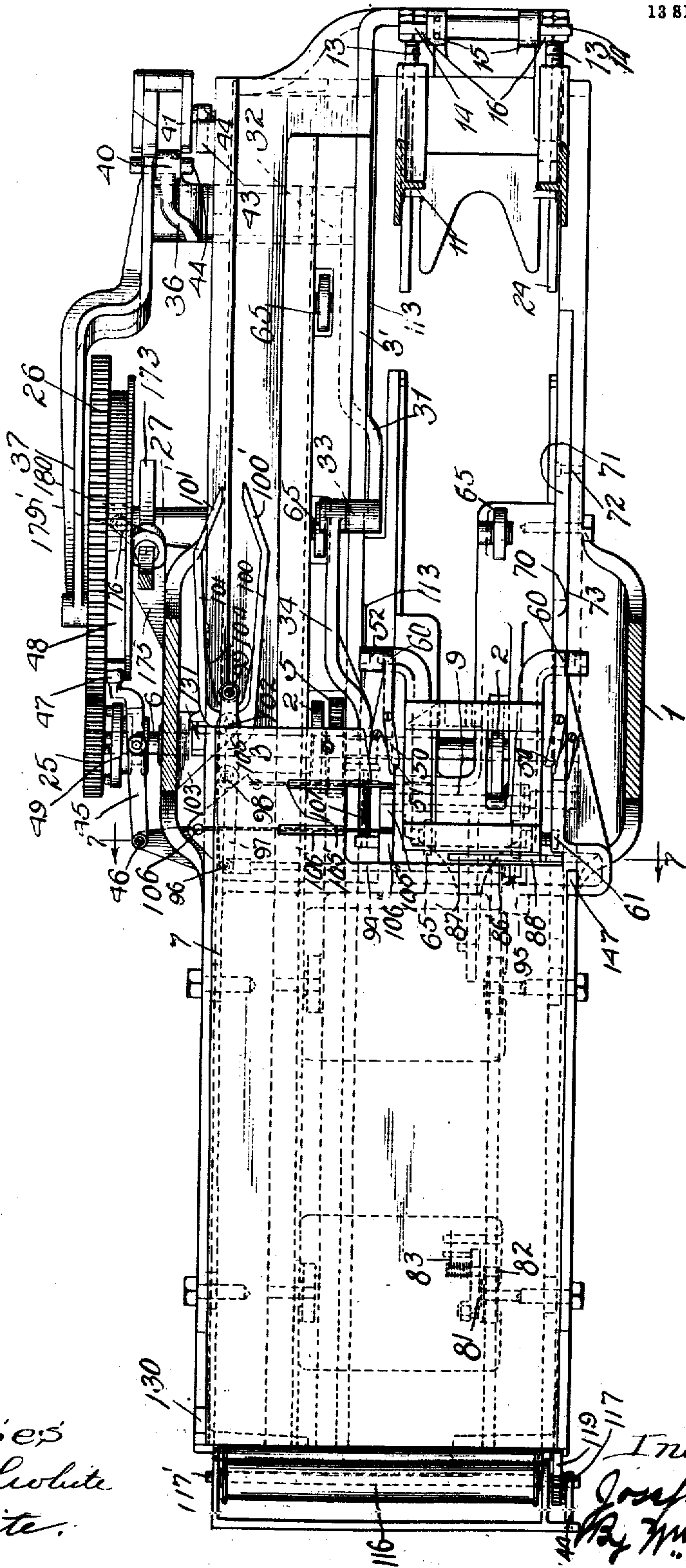
927,510.

J. S. DUNCAN.  
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APPLICATION FILED AUG. 24, 1906.

Patented July 13, 1909.

13 SHEETS—SHEET 3.

Fig. 3



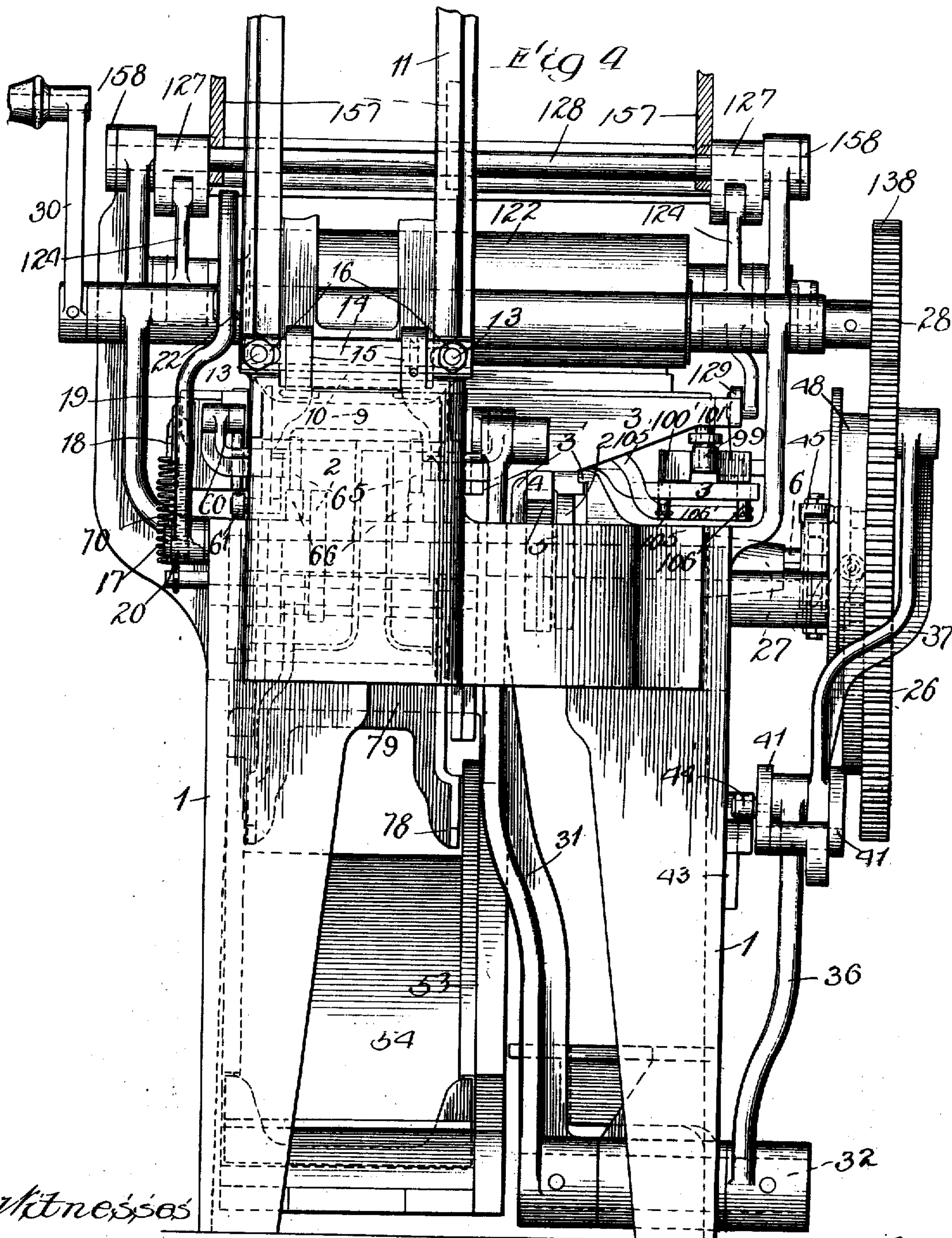
Witnesses  
Harry R. Lovelace  
Ray White.

Inventor  
Joseph S. Duncan  
By Wm. O. Bell Att.

927,510.

J. S. DUNCAN.  
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APPLICATION FILED AUG. 24, 1908.

Patented July 13, 1909.  
13 SHEETS—SHEET 4.



Witnesses  
Harry R. White  
Ray White.

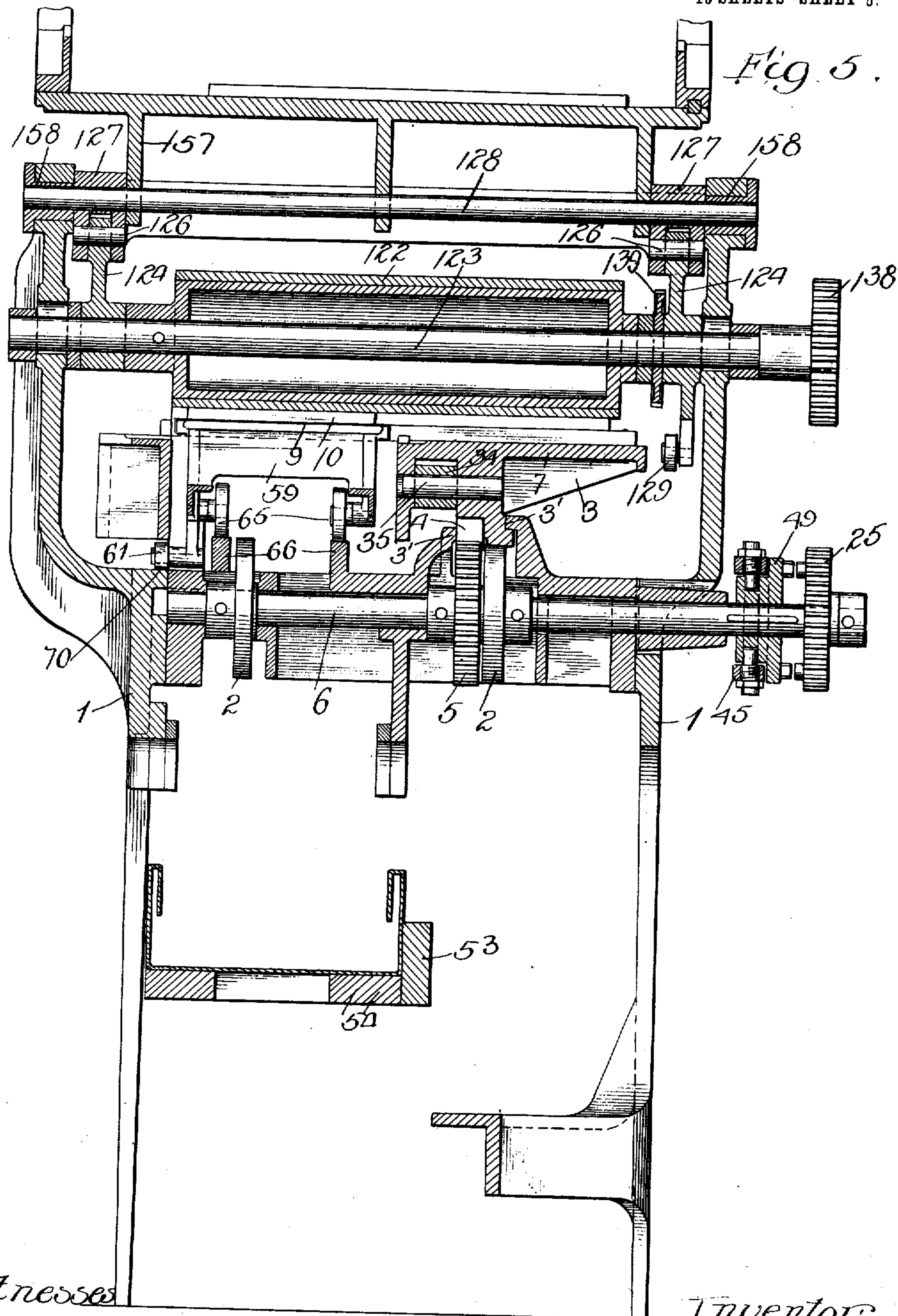
Inventor:  
Joseph S. Duncan  
By Wm. H. Bell  
Att.



927,510.

Patented July 13, 1909.

13 SHEETS—SHEET 5.



Witnesses  
 Harry R. White  
 Ray White.

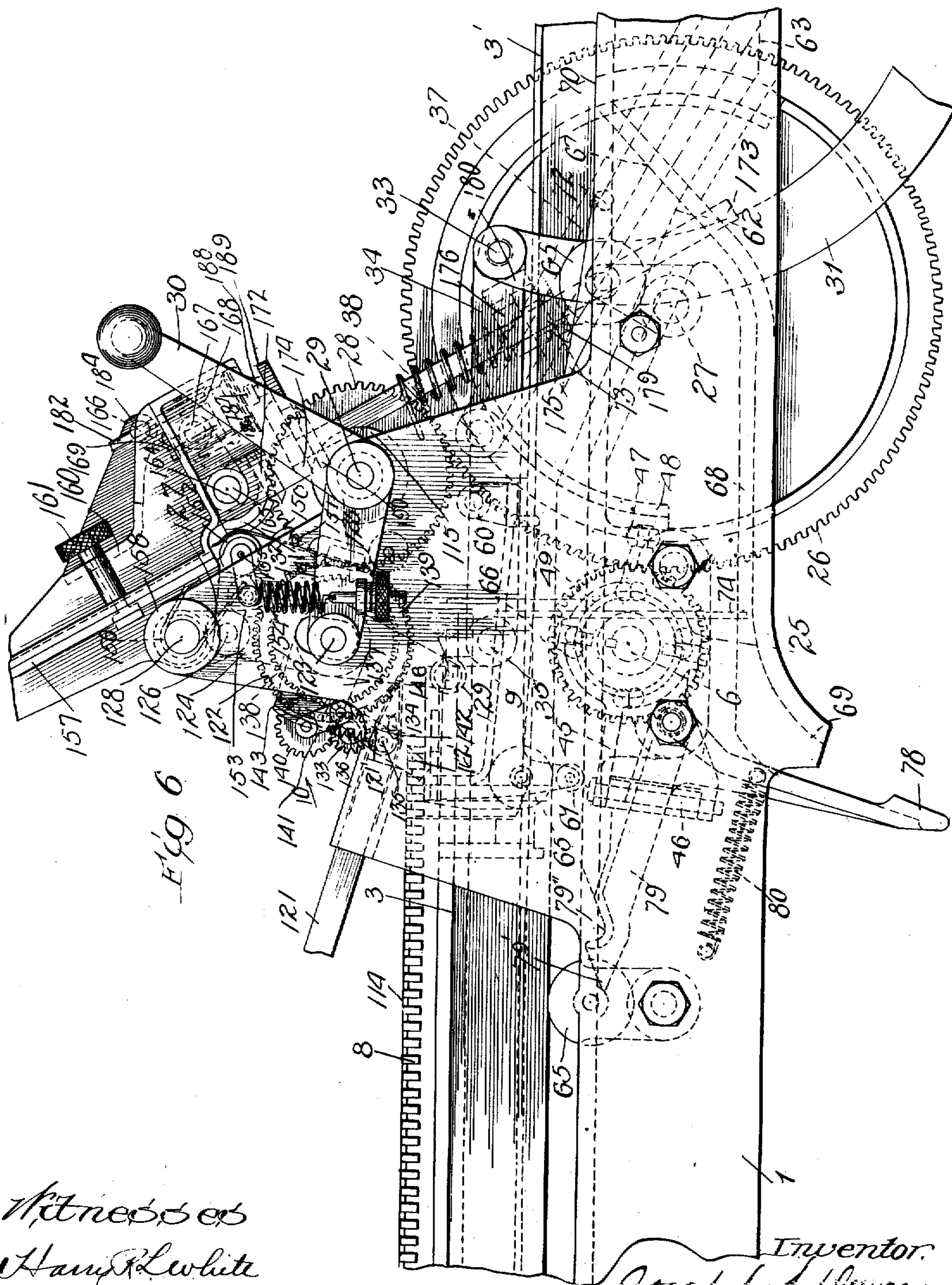
Inventor:  
 Joseph S. Duncan  
 By Wm. H. Bell  
 Atty.

927,510.

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APPLICATION FILED AUG. 24, 1908.

Patented July 13, 1909.

13 SHEETS—SHEET 6.



Witnesses  
Harry L. White  
Ray White.

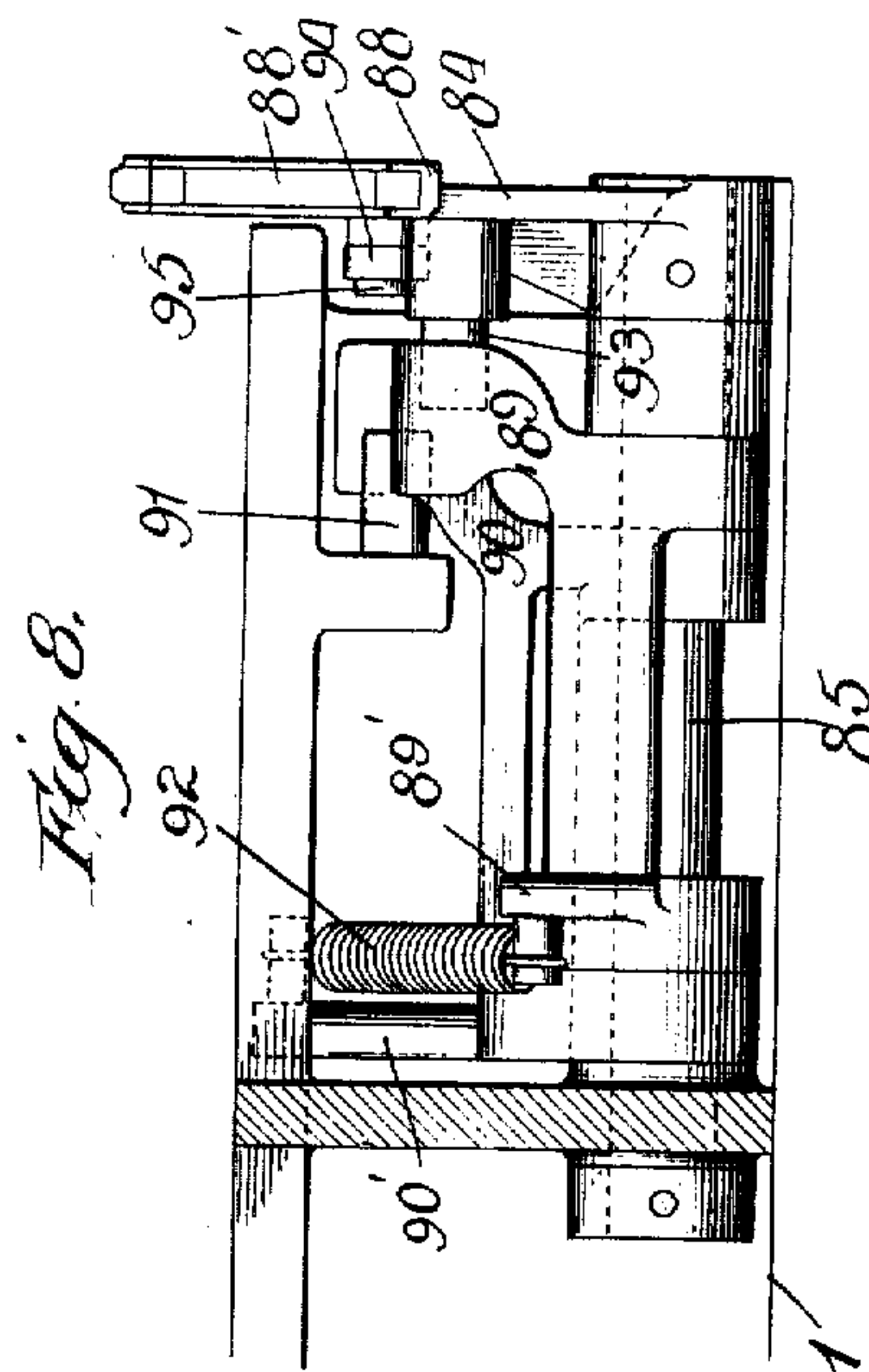
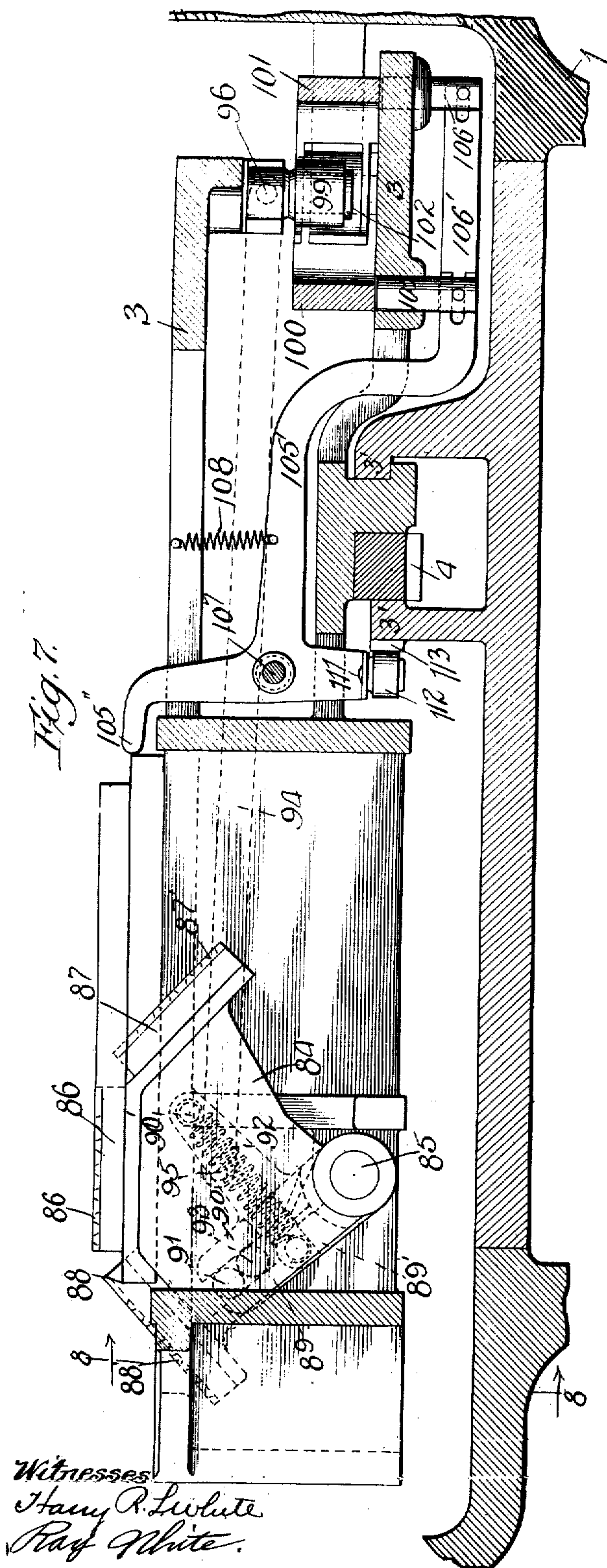
Inventor:  
Joseph S. Duncan  
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927,510.

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APPLICATION FILED AUG. 24, 1906.

Patented July 13, 1909.  
13 SHEETS—SHEET 7.



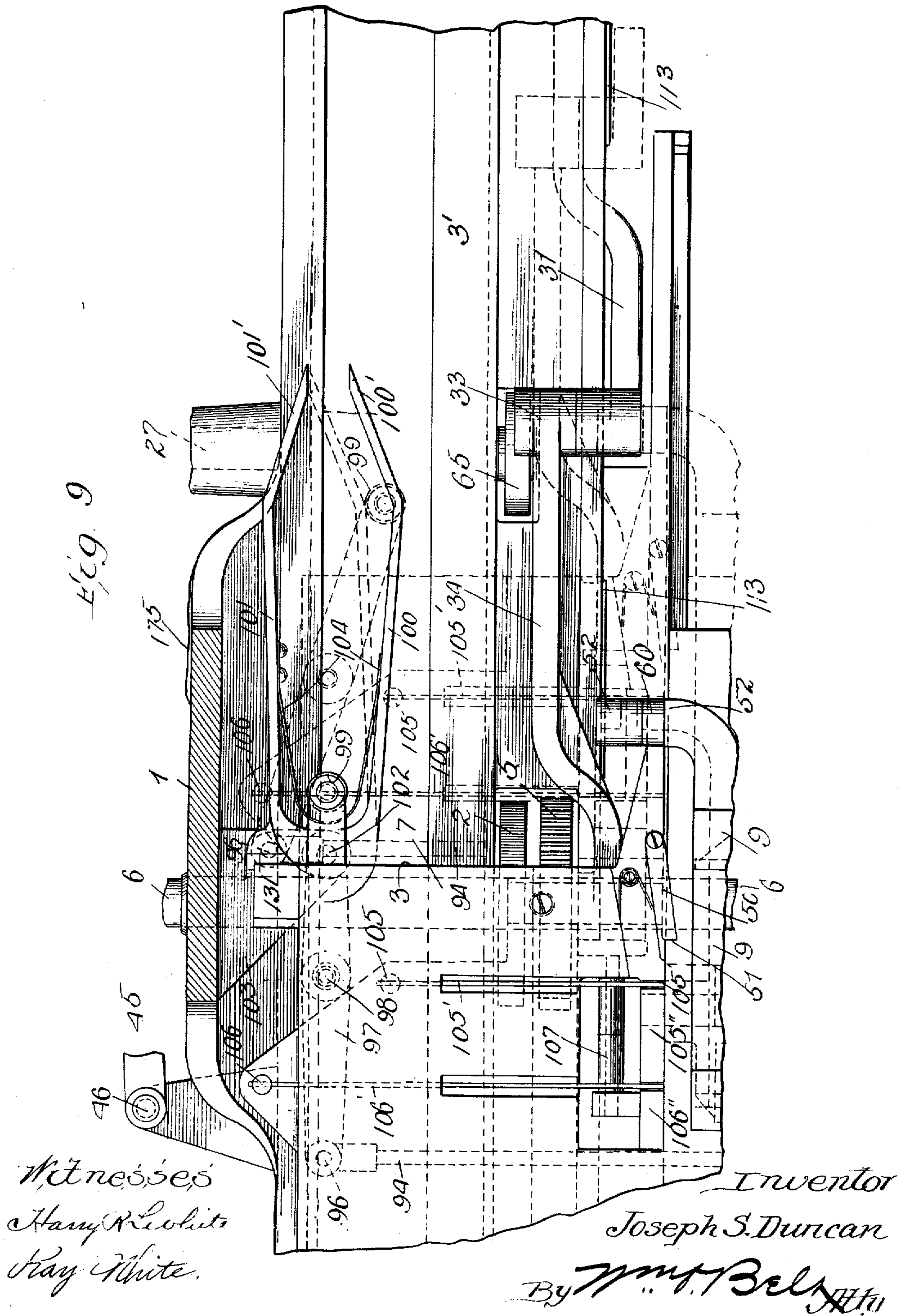
Inventor  
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927,510.

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APPLICATION FILED AUG. 24, 1906.

Patented July 13, 1909.

13 SHEETS—SHEET 8.

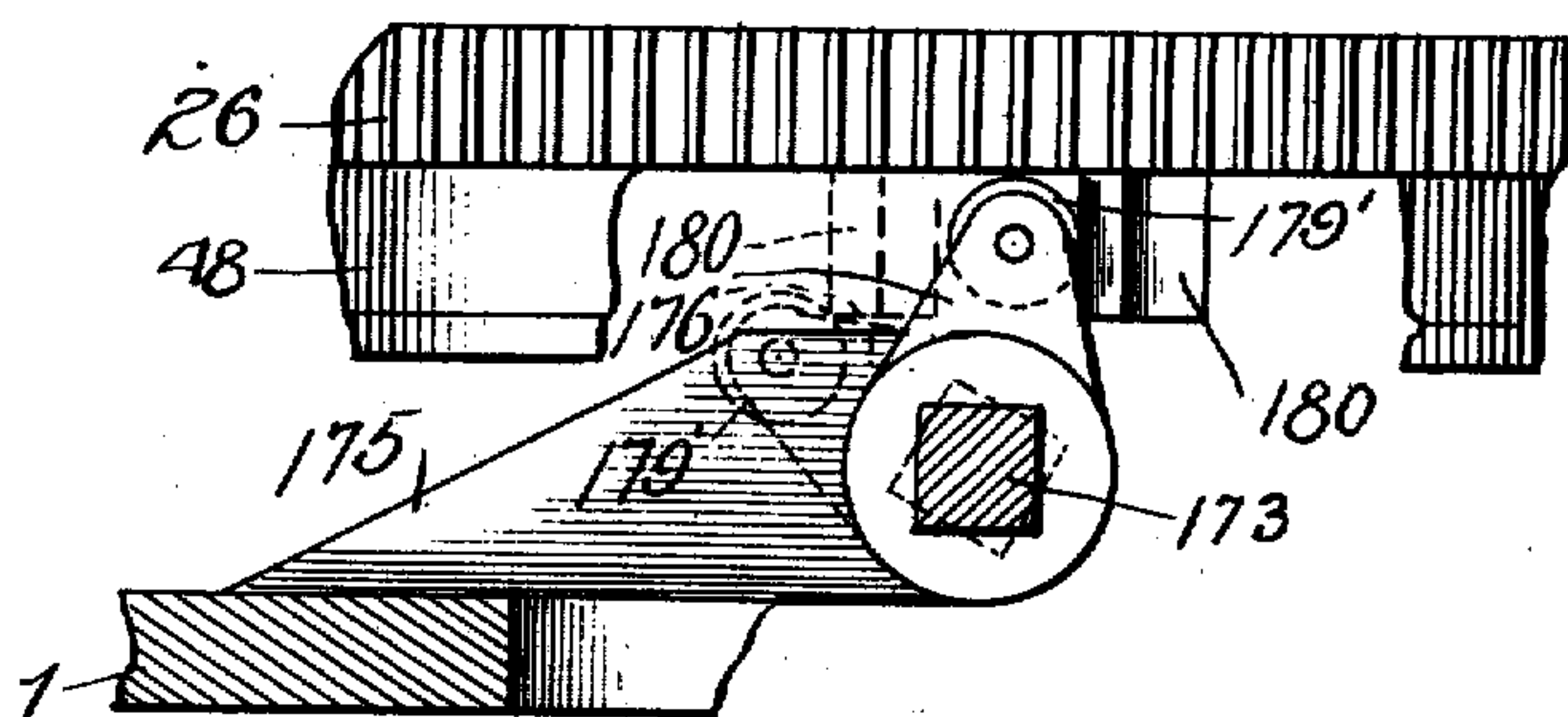
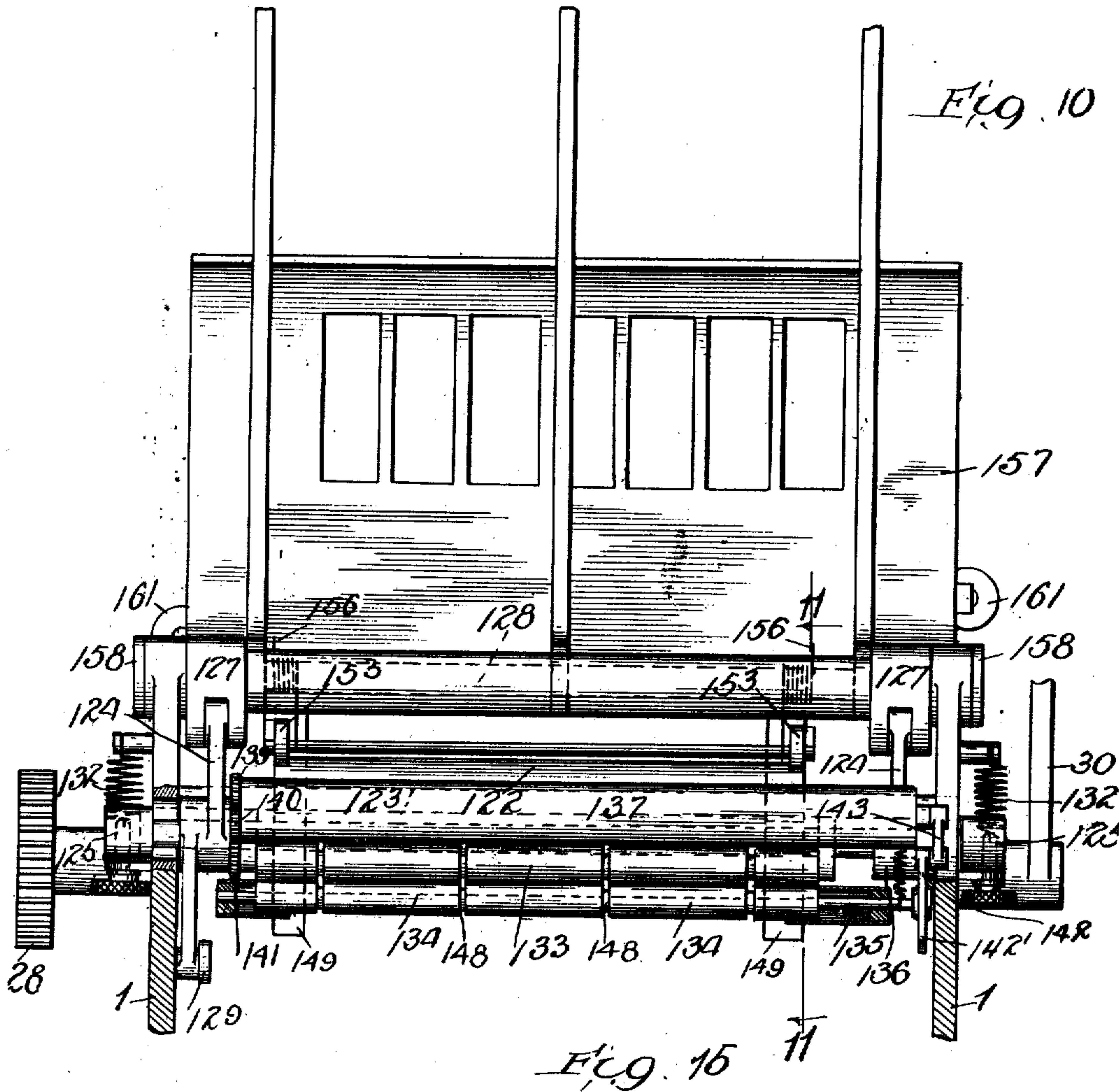




927,510.

J. S. DUNCAN.  
PRINTING MACHINE.  
APPLICATION FILED AUG. 24, 1906.

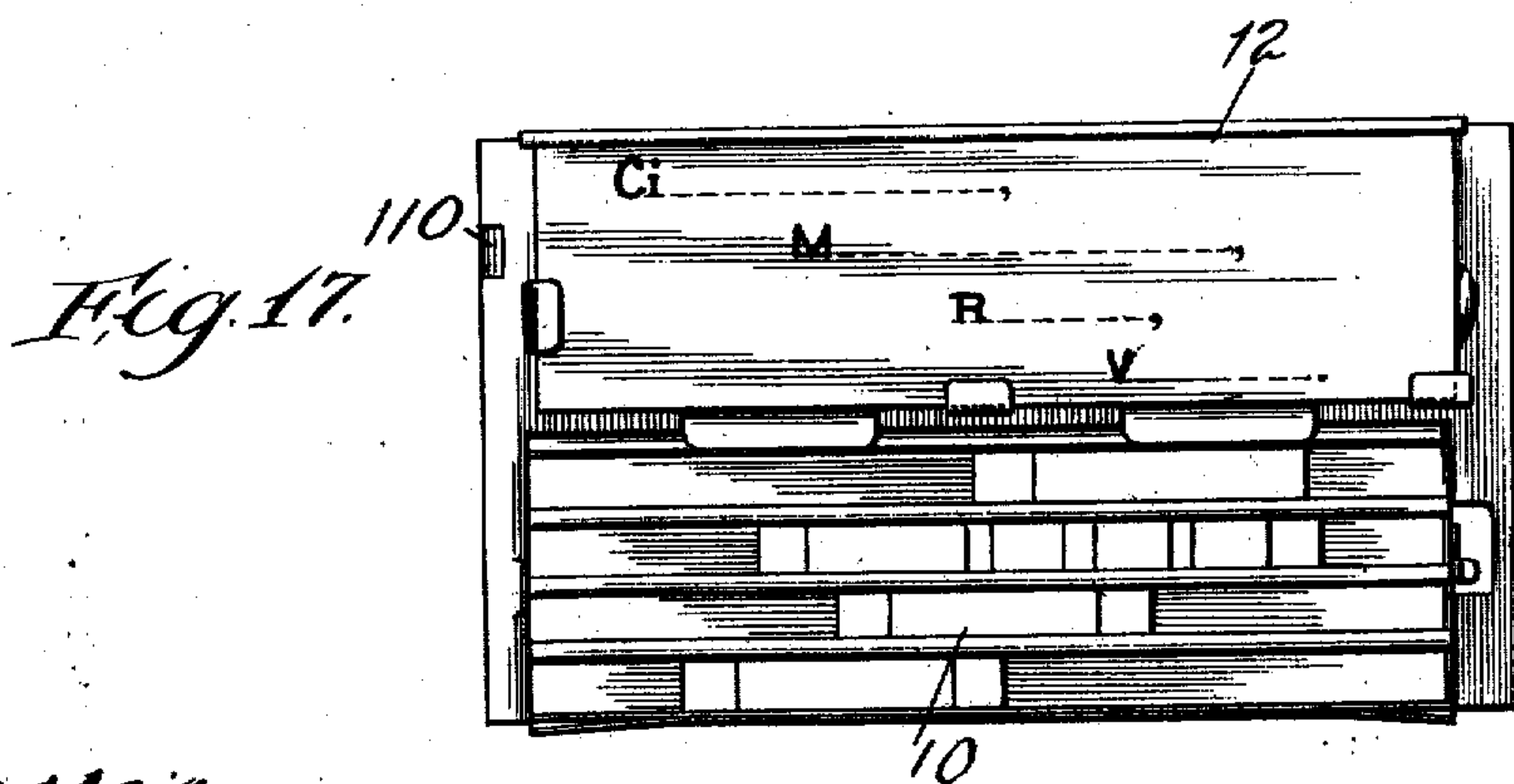
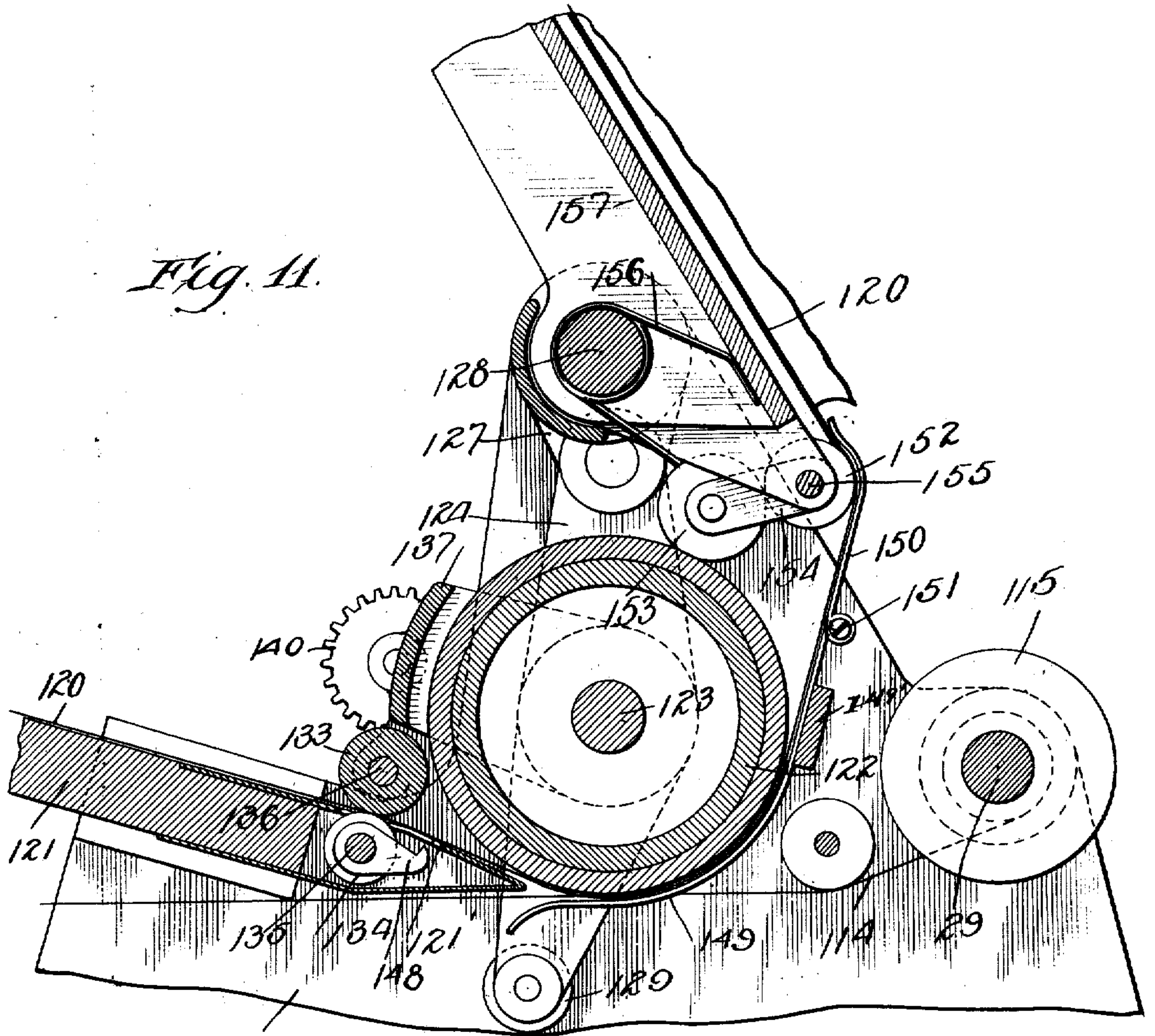
Patented July 13, 1909.  
13 SHEETS—SHEET 9.



Witnesses:  
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Ray White.

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927,510.



*Witnesses*  
*Harry R. White*  
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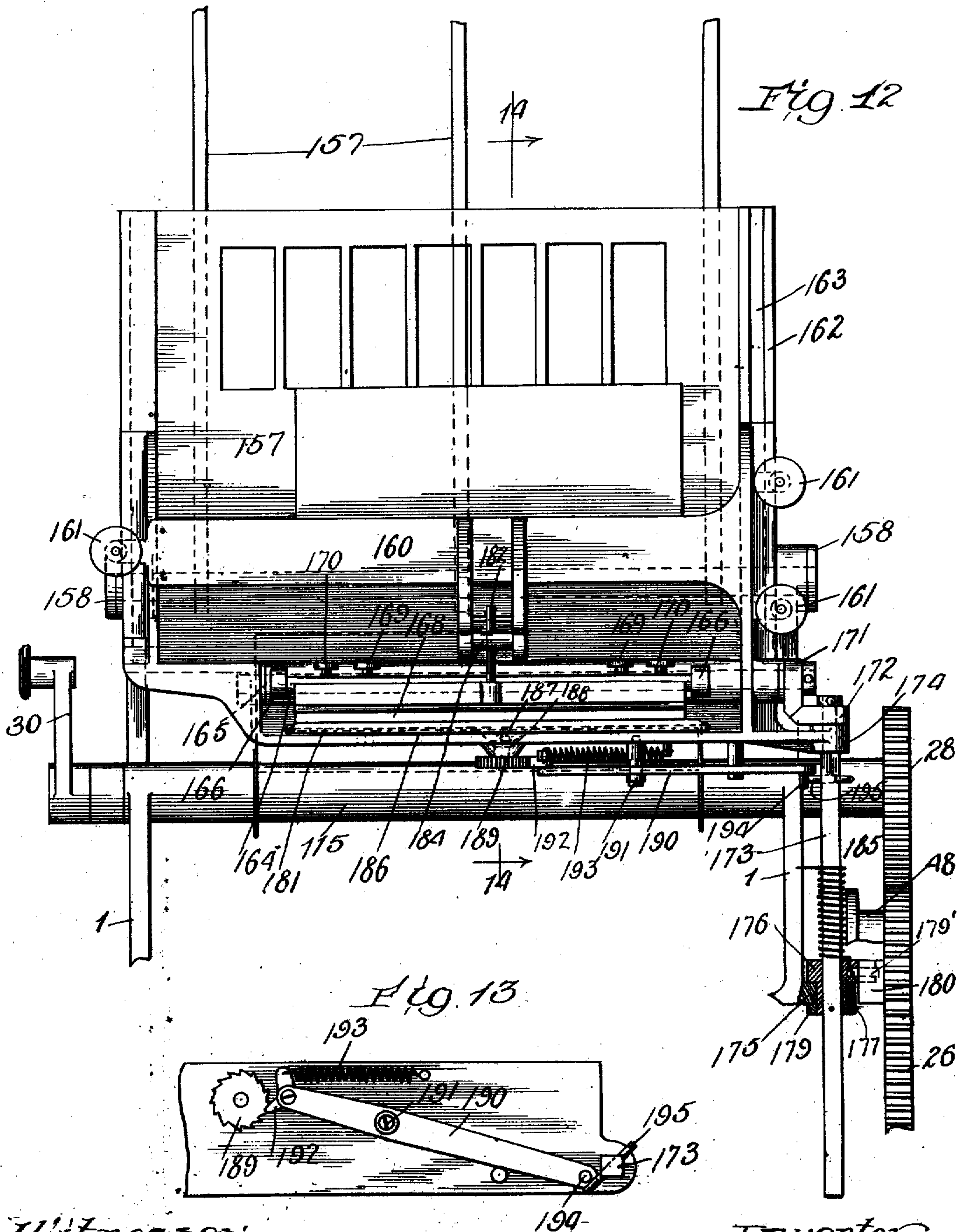
J. S. DUNCAN.  
PRINTING MACHINE.

APPLICATION FILED AUG. 24, 1906.

Patented July 13, 1909.

13 SHEETS—SHEET 11.

927,510.



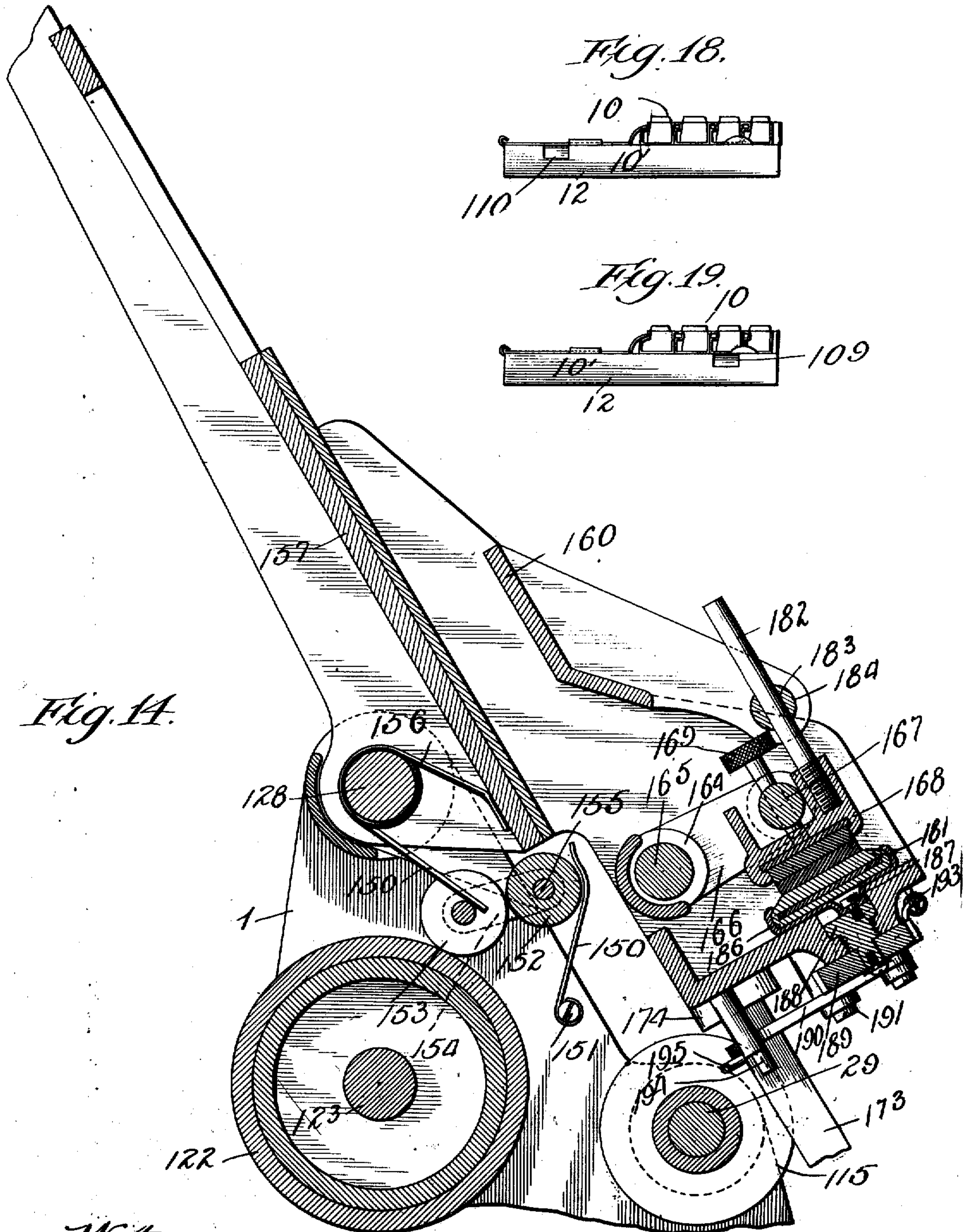
Witnesses:  
Harry R. L. White  
Ray White.

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Joseph S. Duncan  
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Att'y

J. S. DUNCAN.  
 PRINTING MACHINE.  
 APPLICATION FILED AUG. 24, 1906.

Patented July 13, 1909.  
 13 SHEETS—SHEET 12.

927,510.



Witnesses  
 Harry R. White  
 Ray White

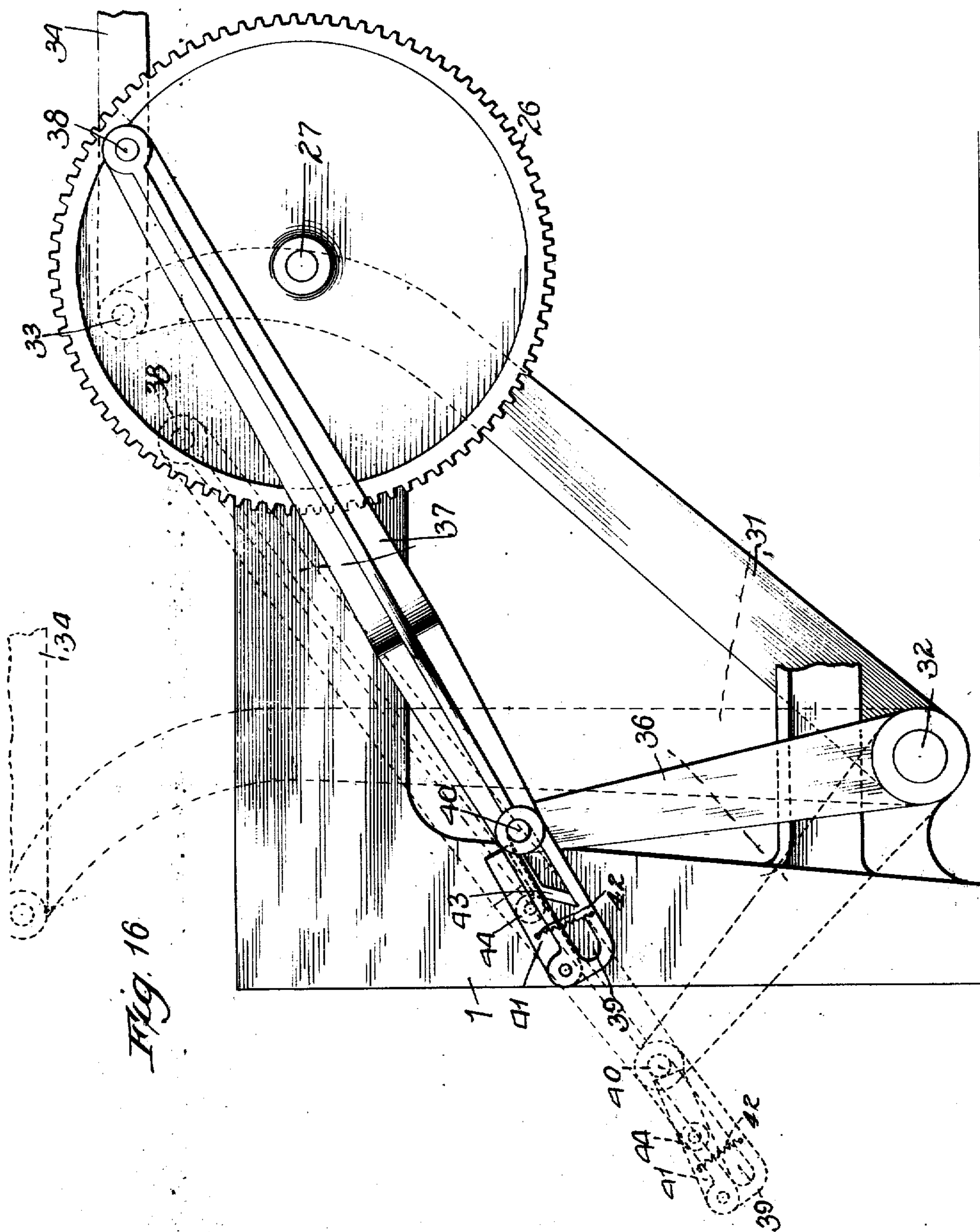
Inventor  
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APPLICATION FILED AUG. 24, 1908.

13 SHEETS--SHEET 13.

**927,510.**



Witnesses  
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By *Wm. B. Bell*  
Atty



# UNITED STATES PATENT OFFICE.

JOSEPH S. DUNCAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO ADDRESSOGRAPH COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

## PRINTING-MACHINE.

No. 927,510.

Specification of Letters Patent.

Patented July 13, 1909.

Application filed August 24, 1906. Serial No. 331,398.

*To all whom it may concern:*

Be it known that I, JOSEPH S. DUNCAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Printing-Machines, of which the following is a specification.

The primary object of this invention is to enable circular letters to be printed in close imitation of typewritten letters and addressed and completed in one general operation of a machine.

Typewritten letters are printed by taking the imprint of type through an inked ribbon on the paper and this gives to the letter a certain appearance or effect, which may be referred to as a "ribbon effect", and which is not found in letters printed without the interposition of a ribbon between the type and the paper.

My invention also has for its object to provide a machine for producing circular letters, printed and separately addressed, with this ribbon effect or appearance.

The invention also has for its object to print circular letters and at the same time print separate addresses on the letters, the addresses being borne by separate and independent printing devices arranged, if desired, in accordance with a card index system, and which are moved one at a time from a pile, printed and returned in their original position in the card index system.

In an extensive list of addresses, such as a subscription list, there will often be male, female and plural addresses scattered indiscriminately therethrough and another object of my invention is to provide for automatically printing on a circular letter the proper salutation for any one of these addresses as may be required.

Typewritten letters are almost invariably signed in a different colored ink from the rest of the letter and to secure a close imitation of the complete typewritten letter my invention has for its object further to stamp an autographic signature directly upon a letter after it has been printed and addressed through a ribbon and in a different colored ink.

A still further object of the invention is to provide a machine of simple construction for accomplishing the objects hereinbefore mentioned and which can be operated by hand; and the invention has also various

other objects in view which will be fully and clearly pointed out hereinafter in the detailed description.

In the accompanying drawings I have illustrated one embodiment of the invention and referring thereto Figure 1 is an elevation showing one side of the machine with a sheet of paper fed inward a sufficient distance to clear the printed heading and the address and letter forms in their initial position ready to print. Fig. 2 is an elevation showing the other side of the machine. Fig. 3 is a plan view, partly in section, with that part above the section line 3—3 on Fig. 1 removed. Fig. 4 is a rear end elevation of the machine omitting the feed board, the signature device and the paper feeding devices. Fig. 5 is a sectional view on the line 5—5 of Fig. 1. Fig. 6 is an enlarged view showing the principal parts of the operative mechanism. Fig. 7 is an enlarged sectional view on the line 7—7 of Fig. 3. Fig. 8 is a sectional view on the line 8—8 of Fig. 7. Fig. 9 is a plan view of the salutation mechanism. Fig. 10 is a front view, partly in section, showing the paper feed rollers. Fig. 11 is a sectional view on the line 11—11 of Fig. 10. Fig. 12 is a rear view showing the signature mechanism. Fig. 13 is a bottom plan view of the ink and shifting device. Fig. 14 is a sectional view on the line 14—14 of Fig. 12. Figs. 15 and 16 are detail views. Fig. 17 is a plan of an address printing device. Figs. 18 and 19 are end views of the address printing device.

Referring to the drawings 1 designates a frame of suitable construction which is provided with a plurality of rollers 2 supporting a carriage 3. This carriage has a rack 4 meshing with a gear 5 on the main or drive shaft 6 whereby the carriage is moved rearward for the purposes hereafter described, being guided by the guides 3'. The carriage is provided with a bed 7 to receive a letter form 8 which is bolted or otherwise rigidly secured on the bed in any suitable manner. The carriage is also provided with a movable bed 9 adjacent to the letter form bed 7 to receive and support the address printing device 10 (Figs. 5, 6, 17).

At the rear end of the machine (Fig. 1) is a magazine 11 to receive the address printing devices 10 (Fig. 17). This magazine is substantially like those illustrated in my



former patents No. 764,660 dated July 12, 1904 and No. 803,677 dated Nov. 7, 1905. and for this reason need not be described in detail. The magazine is hinged to the frame so that it can be swung backward into an inclined position to receive a supply of address printing devices, and this hinge consists of a pair of threaded studs 13 projecting rearwardly from the magazine and passing through a transverse shaft 14 journaled in bearings in the brackets 15 on the frame. The magazine is secured in adjusted position on the frame by nuts 16 carried by the threaded studs 13 on opposite sides of the shaft 14. This construction permits the magazine to be properly adjusted on the machine relative to the travel of the carriage and also permits the magazine to be removed from the machine without changing the adjustment. The magazine is normally held rigidly in upright position by spring 17 which is connected to a lug 18 on the arm 19 pivoted at 20 to the frame. This arm has a shoulder 21 which henges a roller 22 on the magazine. The arm 19 is provided with a socket 23 to receive the roller 22 when the magazine is swung rearwardly, and hold the magazine rigidly in this inclined position.

The stack of address printing devices in the magazine is supported on the projections 24 which permit these devices to be moved forward one at a time from the bottom of the stack without disturbing the other devices in the stack. A gear 25 is mounted on the main drive shaft 6 (Fig. 5) and meshes with a large gear 26 mounted on the stud shaft 27 (Figs. 1, 4, 6). A gear 28 on the shaft 29 meshes with the gear 26 and this shaft 29 is provided with an operating handle 30. A lever 31 is rigidly mounted at one end on the rock shaft 32 and its other end is pivotally connected at 33 with a link 34 which is pivotally connected to the carriage by a pin 35 (Fig. 1). An arm 36 is also rigidly mounted on the rock shaft 32 in an angular position with relation to the lever 31 and is intermittently connected to the gear 26 by a connecting rod 37 which is pivotally connected to said gear by the wrist pin 38 (Fig. 2). The connection between the arm 36 and the connecting rod 37 is shown in detail in Fig. 16, the rod being provided with a longitudinal slot 39 near its end and the arm having a pin 40 which works in said slot. A pair of spring actuated dogs 41 are mounted on the connecting rod 37 at its outer end and project inwardly to swing down behind the pin 40 when the latter is at the extreme forward end of the slot. A pin 42 on the dogs limits their downward movement. A cam 43 is arranged on the side of the frame in the path of an anti-friction roller 44 on the dogs to raise the dogs out of engagement with the pin 40 on the rearward movement of the arm 36. A clutch strap 45

is pivotally mounted at 46 on the main frame and is provided with a roller 47 which travels in a grooved cam 48 keyed or otherwise rigidly fastened to the large gear 26 (Fig. 3). This clutch strap operates a clutch 49 which is arranged on the shaft 6 to make locking engagement with the gear 25.

The carriage is moved rearward (to the right from the position shown in Fig. 1) by the gear 5 operating the rack 4 and this gear is rotated by the main shaft 6 which in turn is actuated by the handle 30 through the gears 28, 26 and 25 and the clutch. The cam 48 is constructed to operate the clutch strap and throw the clutch in and out of engagement with the gear 25 to enable the carriage to reciprocate.

In view of the fact that the movement of the carriage must be performed with extreme accuracy in order to provide for the proper positioning of the address printing device bed beneath the stack of said devices in the magazine I prefer to throw out the clutch before the rearward movement of the carriage is completed and complete this movement by means of the devices attached to the rear end of the carriage and operated by the gear 26. I have constructed the machine so that the cam will throw out the clutch when the carriage has arrived within a half inch of the limit of its rearward movement and at this time the pin 40 will be located at the forward end of the slot 39 in the connecting rod. The continued revolution of the gear 26 swings the arm 36 forward and rocks the shaft 32 to swing the lever 31 and move the carriage to the limit of its rearward movement. At this time the bed 9 is registering properly beneath the stack of address printing devices in the magazine and the wrist pin 38 is passing its center. Then the carriage begins its forward movement which is accomplished entirely by the device connecting the rear end of the carriage with the gear wheel and while the clutch is disengaged from the gear 25. In this way I provide for absolute registration of the bed 9 beneath the stack of address printing devices at each operation of the machine and while I have found it to be desirable to disengage the clutch when the carriage is within a half inch of the limit of its rearward movement, this is discretionary and may be changed if found desirable.

To remove the bottom address printing device from the stack I provide the carriage with a pair of spring pressed dogs 50 which yield to pass the ends 10' of the address printing devices 10 on the rearward movement of the carriage and spring into position behind the ends of said address printing device when the carriage reaches the limit of its rearward movement in position to push the bottom printing device from beneath the stack on the forward movement of the



carriage. (Fig. 3.) The bed 9 is made to fit the address printing device and the dogs not only operate to push the device forward from the stack but also hold the device in place on the bed against rearward movement during the printing operation. The address printing device is discharged from its bed immediately after it has printed and is then discharged into a tray 53 which rests in an inclined position on a support 54 pivotally mounted at 55 on the main frame (Fig. 1). The tray is held in elevated position by a lever 56 which is pivoted at 57 to the support 54 and is arranged to engage a pin 58 on the main frame to hold the support and tray in tilted position as shown in Fig. 1. The bed 9 is carried by a swinging frame 59 which is pivotally connected at 60 to the carriage and swings downwardly to discharge the printing device in the manner just described after it is printed. The swinging movement of this frame is produced by a roller 61 mounted on the frame 59 and arranged to travel on a track on the main frame. This track inclines downwardly and rearwardly at 62 to a horizontal part 63 and then inclines upwardly and rearwardly at 64. While the printing device is printing the frame 59 is supported by rollers 65 traveling on short tracks 66 on the main frame (Fig. 5) and after the printing device has printed the rollers 65 pass off tracks 66 and the roller 61 begins to travel on the track 62 and support the forward or free end of the frame 59. While the roller 61 is traveling down the track 62 the frame 59 finally tilts to a position to discharge the printing device on the bed 9. The printing device is discharged from said bed on to guides which are inclined at their rear ends 67 and have a horizontal part 68 and an inclined discharge end 69 located above the front end of the tray supported in tilted position on the support 54 to receive the printing device.

At the upper end of the track 64 is a horizontal track 70 on which the roller 61 rests when the carriage is at the end of its rearward movement. A switch 71 is pivoted on the main frame at 72 in alignment with the track 70 and forms therewith a continuous track, the end 71' of said switch being beveled to fit against the track 64. As the roller 61 travels up the track 64 it will raise the switch 71 and then pass on to the track 70, the switch falling by gravity into normal position, as shown in Fig. 1. On the forward movement of the carriage the roller 61 will pass from the track 70 on to the switch 71 and thence back to the position shown in Fig. 1. The switch is provided in front of its pivot with an angularly disposed end 73 which acts as a guide or stop to make the roller 61 travel down the incline track 62 on the rearward movement of the carriage. It will be observed

that the bed frame carrying the address printing device is caused to swing into tilted position immediately after the address has been printed to discharge the printing device therefrom and then this frame is returned to its normal horizontal position to receive the bottom printing device in the stack by the time the carriage has reached the limit of its rearward movement. The printing devices slide from the bed of the frame 59 when it is in its inclined position on to the inclined guides 67 and down these guides to the horizontal part 68 thereof. A depending finger 74 is carried by the frame 59 and is arranged to engage the printing device resting on the guides 68 when the carriage moves forward and push it on to the inclined discharge end 69 thereof where it will fall by gravity into the tray.

The address printing devices are preferably arranged in trays in accordance with a regular card index system and it is important not to destroy this arrangement but to return the printing devices after printing to their original position in the tray. In the ordinary operation of the machine the printing devices contained in the tray are discharged into the magazine without changing their arrangement and with the printing device which was at the front of the tray uppermost in the magazine. The tray is then arranged in tilted position on the support to receive the printing device after the printing operation, the follower 75 having first been moved to the front of the tray. The printing device which was at the rear end of the tray will be printed first and discharged into the tray at the front end thereof in front of the follower. It then becomes necessary to pack the printing devices in the tray and gradually move the follower rearward therein. To accomplish this automatically I provide a packer which consists of a bell-crank lever 76 pivoted at 77 on the main frame and having an arm 78 which projects downward into the tray and a forwardly projecting arm 79. A spring 80 fastened to the frame and the arm 78 normally holds said arm at the front of the tray. A lever 81 is pivotally mounted on the carriage at 82 and is normally held in inclined position, as shown in Fig. 1 by a spring 83. The lower end of this lever is arranged to slide over the end 79' of the arm 79 of the packer on the rearward movement of the carriage and seat itself in a socket 79'' in said arm of the packer on the forward movement of the carriage. When the lever seats itself as just described it will swing the packer and cause the arm 78 to push the address printing device rearward in upright position in the tray.

The letter form, preferably including the date, remains unchanged while the address



is changing at each printing operation. It therefore becomes necessary to provide a salutation as required by each particular address. Thus one address will require the single male salutation "Dear Sir", another the single female salutation "Dear Madam" and another the plural salutation "Gentlemen". The relative position and arrangement of these three salutations may be changed as found desirable to suit particular lists of addresses. For the purpose of this description it will be assumed that the salutation most often used is the "Dear Sir" salutation and this is arranged in position to print at all times except when the salutation device is adjusted to bring one of the other salutations into printing position to correspond with the address to be printed. The salutation forms are supported end to end on the edge of the plate 84 which is rigidly mounted on a rock shaft 85 supported on the carriage. The edge of this plate has three straight sections 86, 87 and 88 angularly disposed with relation to each other and form the bases of contiguous segments of a circle described from the center of shaft 85, the "Dear Sir" form 86' being mounted on the central section 86, the "Gentlemen" form 87' on the section 87 and the "Dear Madam" form 88' on the section 88. These salutation forms are preferably made of metal type or logotypes and are secured in any suitable manner on the plate. The plate is normally held with the "Dear Sir" form in horizontal printing position. (Fig. 7) and it is held in this position by two centralizing levers 89 and 90 pivotally mounted on the rock shaft 85. These levers are arranged on opposite sides of a fixed pin 91 on the carriage and are provided at their rear ends with arms 89' and 90' which are connected at their outer ends by a spring 92 (Fig. 8). A pin 93 on the salutation plate projects between the two levers 89 and 90, and it will be readily understood that the spring 92 holds the levers 89 and 90 in contact with the fixed pin 91 on the carriage and the pin 93 on the plate to centralize the plate and hold the form which is most used, the "Dear Sir" form as heretofore described, in horizontal printing position. The salutation plate is swung to bring one of the other salutations in printing position by a connecting rod 94 pivotally connected at one end 95 to the plate 84 and at its other end 96 to one end of a lever 97 pivoted at 98 on the carriage and carrying at its other end a roller 99 (Fig. 3). When the salutation plate is centralized, that is to say when the middle salutation is in printing position, the lever 97 holds the roller 99 in the position shown in Fig. 3 between two bent arms 100, 101 which are pivotally mounted independent of each other at 102 on a bracket 103 forming part of the main frame. A spring 104 suitably arranged

operates to hold these arms normally separated at their outer free ends which are bent inwardly at 100' and 101', said arms forming tracks for the roller 99. The roller 99 travels back and forth with the carriage in a path extending through between the outer ends of these shifting arms when the salutation plate is centralized and in order to swing the salutation plate to carry one of the other salutations into printing position one of these arms is moved automatically so that in the forward movement of the carriage the roller 99 will travel on the track formed by the arm and swing the lever 97 on its pivot thereby, through the medium of the connecting rod 94, swinging the salutation plate properly to bring the desired salutation into printing position. This movement of the shifting arms 100, 101 is effected by a pair of tumblers cooperating with the printing devices, one tumbler being provided to cooperate with all printing devices constructed in a certain manner to cause the salutation required by that particular address to be brought into printing position. The other tumbler is constructed to cooperate with the other set of printing devices which require the third salutation. These tumblers are constructed and operated alike but are only operated by the particular address printing device with which they are intended to cooperate.

The tumblers comprise the pins 105 and 106 carried on one end of the levers 105', 106' which are pivoted independently of each other at 107 on the carriage. The other ends 105'', 106'' (Figs. 3, 7) of these levers are normally projected forward by a spring 108 to engage the end 10' of the printing device 10. The printing devices requiring the "Gentlemen" salutation are constructed to operate the tumbler lever 106' and the address printing devices requiring the "Dear Madam" salutation are constructed to operate the tumbler lever 105', but the one lever will not be operated by the printing device constructed to operate the other lever. The printing devices may be constructed in various ways to effect the operation of the tumblers as heretofore mentioned but I have shown in the drawings a simple construction in which the end of those printing devices requiring the "Gentlemen" salutation are indented at 109 and the end of those printing devices requiring the "Dear Madam" salutation are indented at 110 to receive the ends of the tumbler levers. (Figs. 18, 19.) It will be understood, of course, that these indentations may be located in any other position in the ends of the printing devices to accomplish the desired result. Each of the tumbler levers is provided with a downward projection 111 carrying an anti-friction roller 112 (Fig. 7) which is arranged to travel for, say the last



half of the rearward travel and the first half of the forward travel of the carriage, in contact with the track 113 on the main frame which swings the levers on their pivot 107 to carry the ends 105'', 106'' away from the end of the printing device. This is necessary to throw the tumbler levers out of the path of the bottom printing device in the stack on the rearward movement of the carriage. The letter and date form, address and salutation forms print through a ribbon 114 which is held taut upon the forms and is automatically fed a predetermined distance at each operation of the machine. The ribbon is fastened at one end to a spring roller 115 revolvably supported on the main frame and at its other end is fastened to a ratchet roller 116 provided at one end with a ratchet wheel 117 which is operated by a feed pawl 118 and locked by a locking pawl 119, both of these pawls being spring pressed (Fig. 1). The ratchet roller 116 is revolvably mounted on the front end of the carriage and of course moves with the carriage and during the rearward movement of the carriage the ribbon is automatically wound up on the spring roller 115. On the forward movement of the carriage the ratchet is fed forward one or more teeth to shift or feed the ribbon correspondingly and this will be explained more fully hereafter.

The paper 120 is supported in a pile on a feed board 121 held in a tilted position on the main frame above the carriage when the latter is at its forward position (Fig. 1). The paper is fed inward by hand to feed mechanism which carries it beneath a platen roller 122 mounted on a shaft 123 journaled in the toggle levers 124 and also in the ends of the links 125 which are pivotally mounted on the shaft 29. The links 125 constitute a swinging frame which carries the platen roller and the toggle levers 124 are pivoted at 126 to the short toggle levers 127 pivoted at 128 on the main frame. The toggles operate to swing the platen frame and carry the platen into and out of operative position. The toggle levers 124 carry rollers 129 on their lower ends which are arranged to be engaged by a stop 130 adjustably mounted on the carriage near its front end and a stop 131 adjustably mounted on the carriage at its rear end. When the stop 130 strikes the roller 129, on the rearward movement of the carriage, the toggle will be thrown off center allowing the spring 132 (Fig. 6) which is attached at its upper end to the main frame and at its lower end to the swinging platen frame, to pull the platen up out of operative position. When the stop 131 engages the roller 129 on the forward movement of the carriage the toggle levers are thrown on center again and the platen roller is thereby moved to opera-

tive position. In the drawings the toggles are shown slightly off center to lock them and prevent accidental upward movement of the platen roller. The stops can be adjusted on the carriage to control the movement of the platen as may be desired.

The paper feed mechanism of the machine comprises a positive feed roller 133 operating on the upper face of the paper and a plurality of idler feed rollers 134 operating on the underface of the paper, the latter being carried by a shaft 135 housed in the recessed front end 121' of the feed board. The feed roller 133 is mounted on the shaft 136 which is journaled in a swinging frame 137 pivotally mounted on the platen shaft 123. The platen shaft carries a gear 138 which meshes with the gear 28 on the shaft 29 and another gear 139 on the platen shaft (Fig. 5) meshes with an idler gear 140 mounted on the frame 137. This idler gear also meshes with a gear 141 on the feed roller 133 (Fig. 6). A lever 142 is rigidly mounted on the idler feed roller shaft 135 and its upper end is connected by a link 143 to the swinging frame 137. The lower end 142' of this lever is arranged in the path of a bell crank lever loosely mounted on the shaft 117' carrying the ratchet roller 117. This bell crank lever has an upwardly and rearwardly extending arm 144 which engages the lower end of the lever 142 and the other arm 145 of said bell-crank lever carries the feed pawl 118 (Fig. 1). As the carriage moves rearward the arm 144 strikes the lever 142 and swings it on its pivot until the toggle formed by said lever and the link 143 crosses its center and is held locked in this position by a stop 146 on the link which engages the lever. The frame 137 is thus swung upward and the feed roller carried out of operative position as the front end of the carriage passes printing position. After the toggle is moved to locked position the carriage continuing its travel rearward carries the arm 144 under the lever 142, whereby said lever arm is depressed and the arm 145 carries forward the pawl 118 to feed the ratchet forward one step. Thus the ribbon is fed endwise at each operation of the machine. On the forward movement of the carriage a block 147 adjustably mounted on the frame engages the lower end of lever 142 and swings it back to its normal position thus permitting the frame 137 to lower and carry the feed roller 133 into operative position (Figs. 1, 6).

A plurality of fingers 148 are fastened rigidly on shaft 135 and are thrown upward, when said shaft is rocked with the lever 142, in the path of the sheet of paper next to be fed to the machine for the purpose of preventing the paper from passing to printing position until the carriage has moved to its initial position at the front end of the frame.



As just described the block 147 strikes the lever 142 and swings it back to lower the feed roller into operative position and this feed roller lowers upon the sheet of paper which has been held in position by the fingers, the latter being swung downward out of the path of the paper at the same time that the feed roller is lowered into operative position. The block 147 can be adjusted in any suitable manner lengthwise of the carriage and it is preferably located to operate the lever 142 for the purposes heretofore described to bring the feed roller into operative position before the forms are carried forward to printing position which is immediately below the center line of the platen roller. The feeding mechanism is thus brought into operation to move the paper forward before the carriage reaches printing position because the printing will ordinarily be done on letter paper having a printed heading and it is necessary to feed the sheet until the heading thereon has passed printing position before the printing operation can take place.

In the embodiment of my invention illustrated in the drawings the carriage lowers the platen roller but the feed roller is thrown in operation while the platen roller is elevated and before the carriage has reached the limit of its forward movement. These movements can be otherwise timed and will be varied according to the particular construction of the machine, but, as before stated, the feed roller will preferably be thrown into operation before the platen is lowered to operative position and also before any part of the form reaches printing position. This arrangement may of course be used for other reasons than because the paper is provided with a printed heading and may be dispensed with entirely if desired.

The paper is fed by the roller 133 and the platen from printing position on guides 149 (Figs. 1, 10, 11) fastened to lugs 149' on the links 125 and thence upon spring guides 150 fastened at 151 to the main frame and projecting upward alongside the supplemental feed rollers 152. Narrow friction rollers 153 are carried by links 154 pivoted on the shaft 155 of roller 152 and these rollers 153 are held in frictional engagement with the platen roller by spring 156 arranged on the shaft 128. The main feed roller 133 is driven by gearing from the platen roller shaft and the supplemental feed roller 152 is frictionally driven by the rollers 153 which travel in contact with the platen roller. The gears 139, 140 and 141 for driving the main feed roller 133 are timed so that said roller and the supplemental feed roller will travel at the same peripheral speed as the platen roller, although it is not absolutely essential that the supplemental feed roller should travel at the same speed as the other rollers

for the paper will have passed out of operative engagement with the platen roller before arriving at operating engagement with the supplemental feed roller. The spring guides 150 hold the paper against the roller 152 and the latter feeds the paper upward on to the discharge table 157 which is mounted rigidly on the shaft 128. The shaft 128 is provided at its ends with eccentric bushings 158 revolubly mounted in the main frame (Fig. 5) to allow for the vertical adjustment of the shaft to thereby adjust the platen roller and feed mechanism relative to the carriage.

The sheet of paper stops moving after it passes upward between the spring guides 150 and the roller 152 and is prevented from moving downward by said roller. In this position a signature may be printed on the sheet in a different colored ink from that used in printing the body of the letter and address, if desired, to complete the imitation typewritten letter. If this is not desired the signature device may be dispensed with entirely but as I have heretofore explained I prefer to print the signature on the letter because the letter will then more closely resemble a typewritten letter. This signature device comprises a frame 160 (Fig. 12) which is adjustably secured by hooked thumb screws 161 to the edges of the discharge table, the said frame having guides 162 slidably arranged in grooves 163 in said table. A sleeve 164 is arranged on a shaft 165 journaled in bearings in the signature frame and this sleeve carries at its ends lever arms 166 which support a rock shaft 167 to which the signature stamp 168 is adjustably attached by screws 169. Screws 170 operate through shaft 167 and bear upon the signature stamp to cooperate with the screws 169 in securing a perfect adjustment of the stamp. The shaft 165 carries the segment of a miter gear 171 which meshes with a smaller segment 172 on a square shaft 173 supported on the signature frame at 174 and guided in the lug 175 on the main frame. A lever 176 is arranged on the square shaft 173 and is provided with a hub 177 which rotates in a lug 175 on the main frame and is held in place by a collar 179 on the square shaft. This lever 176 carries a roller 179' which is arranged in the path of the lug 180 on the gear wheel 26. The lever 176 is moved by the engagement therewith of the lug 180 and the shaft 173 is turned ninety degrees which movement is communicated to the shaft 165 to swing the stamp against the sheet of paper. The stamp normally rests on an ink pad 181 supported on the signature frame and the stamp is thrown in the arc of a circle to printing position when the shaft 165 is actuated by a pin 182 working in an opening 183 in a swiveled block 184. By the time the stamp has



printed the lug 180 will have passed the lever 176 and a spring 185 fastened to the main frame of the machine and to the lever will return the lever and the square shaft and the other parts to normal position, the stamp resting on the ink pad.

The ink pad is carried by a frame 186 which is automatically shifted so that the stamp will not always contact with the same part thereof at each operation of the machine. The ink pad frame is fastened by a screw 187 eccentrically to the double shoulder pin 188 operating in the signature frame and carrying on its lower end a ratchet wheel 189. A lever 190 is pivoted on a stud 191 on the signature frame and carries a feed pawl 192 which operates on the ratchet and is held in engagement therewith by a spring 193. The lever is provided with a lug 194 which is arranged to be engaged by a lug 195 on the square shaft 173 whereby said lever is swung each time said shaft is operated and thus the pad is shifted at each operation of the machine, (Figs. 12, 13).

While the machine has a number of parts and there are a number of operations it will, when fully understood, be found to be comparatively simple in its construction and general operation.

In describing the several groups of mechanism I have explained the operation thereof and how they cooperate with each other and it will not be necessary now to review the several operations in detail. It is sufficient to say that a sheet of paper is fed into the machine, an address, the proper salutation for the said address, and the letter are printed thereon with or without a date through a ribbon, and afterward a signature is printed on the letter directly in a different colored ink from that of the remainder of the letter. Of course I may print the signature in the same colored ink as the rest of the letter but I prefer to print it in a different colored ink because it will then more closely imitate a typewritten letter. The printing operation is repeated rapidly, the same letter being printed each time but with a different address and the proper salutation for the address, and the mechanism whereby the address printing devices are moved to printing position and afterward discharged and whereby the proper salutation for the address is moved to printing position are automatic in action.

It has been pointed out heretofore that the machine is especially designed for use in connection with address printing devices arranged in accordance with a card index system, provision being made for maintaining the order and arrangement of the addresses while they are passing through the machine and returning them in their original position in the trays in which they are stored.

The machine will operate very rapidly

and can be run by power as well as manually.

What I claim and desire to secure by Letters Patent is:

1. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage carrying a letter form and an address form and moving in a plane beneath said stack to receive and carry a new address form from the stack at each operation of the machine, an inked ribbon, and a platen above the plane of movement of the carriage and operating to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position.

2. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating below said stack and carrying a letter form and an address form, means on the carriage for taking another form from the stack at each operation of the machine, an inked ribbon, and a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position.

3. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage carrying a letter form and an address form, means for reciprocating the carriage to carry the forms through printing position and move the carriage beneath said stack, an inked ribbon, a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, and means for discharging the address form from the carriage after it has printed and before the carriage reaches the magazine.

4. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage carrying a letter form and an address form, means for reciprocating the carriage to carry the forms through printing position and move the carriage beneath said stack, an inked ribbon, a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, and means on the carriage for taking an address form from the stack when the carriage reaches a position beneath said stack.

5. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage carrying a letter form and an address form, means for reciprocating the carriage to carry the forms through printing position and move the carriage beneath said stack, an inked ribbon, a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, means for discharging the address form from the carriage after it has printed and before the carriage reaches the magazine, and means on



the carriage for taking an address form from the stack when the carriage reaches a position beneath said stack.

6. In a printing machine, the combination of a carriage carrying a letter form and an address form, means for changing the address form at each operation of the machine, an impression platen, an inked ribbon interposed between the forms and the platen, and means for moving the carriage through printing position and beyond the ribbon for the change of address.

7. In a printing machine, the combination of a stack of address forms, a carriage carrying a letter form and an address form, means for changing the address form at each operation of the machine, an impression platen, means for moving the carriage with the forms to a position in front of the platen and then through printing position and beyond the platen to get a new address, and an inked ribbon above the forms while they are in front of the platen and passing through printing position, said ribbon being arranged back of the platen to permit the change of address.

8. In a printing machine, the combination of a reciprocating carriage carrying a letter form, an inked ribbon stretched across said form and attached at one end to the frame of the machine and at its other end to the carriage, and a platen to press a sheet of paper upon the ribbon against the form as the carriage moves the form through printing position.

9. In a printing machine, the combination of a reciprocating carriage carrying a letter form, an inked ribbon stretched across said form and attached at one end to the frame of the machine and at its other end to the carriage, means for feeding said ribbon at each operation of the machine, and a platen to press a sheet of paper upon the ribbon against the form as the carriage moves the form through printing position.

10. In a printing machine, the combination of an inked ribbon, a reciprocating carriage carrying a letter form, an address form and a plurality of salutation forms, and a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, means for changing the address form at each operation of the machine, and means for changing the salutation form as the address requires.

11. In a printing machine, the combination of an inked ribbon, a reciprocating carriage carrying a letter form, an address form, a plurality of salutation forms, a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, and means for automatically changing the salutation form as each address requires.

12. In a printing machine, the combina-

tion of an inked ribbon, a reciprocating carriage carrying a letter form, a platen to press a sheet of paper upon the ribbon against the form as the carriage moves the form through printing position, and a signature stamp to print directly upon the sheet after the letter is printed through the ribbon.

13. In a printing machine, the combination of an inked ribbon, a reciprocating carriage carrying a letter form, an address form, a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, and a signature stamp to print directly upon the sheet after the letter and address are printed through the ribbon.

14. In a printing machine, the combination of an inked ribbon, a reciprocating carriage carrying a letter form, an address form, means for changing the address form at each operation of the machine, a plurality of salutation forms, means for automatically bringing into printing position the proper salutation form for each address, a platen to press a sheet of paper upon the ribbon against the forms as the carriage moves the forms through printing position, and a signature stamp to print directly upon the sheet after the letter, address and salutation are printed through the ribbon.

15. In a printing machine, the combination of an inked ribbon, a stack of address forms, a reciprocating carriage carrying a letter form, an address form and a plurality of salutation forms, means for changing the address form at each operation of the machine, means for moving into printing position the proper salutation form as each address requires, a roller platen to press a sheet of paper upon said ribbon against the forms as the carriage moves the forms through printing position, and a signature stamp to print directly on the sheet after said forms have printed.

16. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and an address form, and automatic means for registering and temporarily holding the carriage beneath the stack of address forms at each operation of the machine.

17. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and an address form, and automatic means for registering and temporarily holding the carriage at the end of its movement in one direction beneath the stack of address forms.

18. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and an address form, means



for moving the carriage through a part of its movement in one direction, and other means for completing the movement of the carriage in said one direction and registering the carriage with the stack of address forms.

19. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and an address form, means for moving the carriage through a part of its movement in one direction, and other means for completing the movement of the carriage in said one direction and registering the carriage with the stack of address forms and returning the carriage to its initial position.

20. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and an address form, a rack on the carriage, a gear meshing with said rack, means for driving said gear, and means for disconnecting said driving means before the carriage has completed its movement in one operation of the machine.

21. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and an address form, a rack and gear for moving the carriage in one direction, means for driving said gear, means for disconnecting said driving means before the carriage completes its movement in one direction, and other means for completing the movement of the carriage in said one direction and returning the carriage to its initial position.

22. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, and means for actuating said lever to move the carriage for a part of its travel.

23. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, and actuating means intermittently locked to said lever for causing the lever to move the carriage for a part of its travel.

24. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, a rack and gear for moving the carriage in one direction, an oscillating lever connected to the carriage, and means for ac-

tuating said lever to move the carriage in the other direction.

25. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, a rack and gear for moving the carriage a part of its travel in one direction, and a lever connected to the carriage and intermittently actuated to move the carriage to the limit of its travel in said direction and return the carriage to its initial position.

26. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, an arm to operate said lever, a gear, and a rod connected to said gear and arm.

27. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, an arm to operate said lever, a gear, a rod connected to the gear, and means for intermittently connecting the rod to the arm.

28. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, an arm to operate said lever, a gear, a rod connected to the gear at one end and provided with a slot in its other end, a pin on the arm operating in said slot, and means for locking the pin to the rod.

29. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, an arm to operate said lever, a gear, a rod connected to the gear at one end and provided with a slot in its other end, a pin on the arm operating in said slot, and dogs carried by the rod and arranged to lock the pin in the slot.

30. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, an oscillating lever connected to the carriage, an arm to operate said lever, a gear, a rod connected to the gear at one end and provided with a slot in its other end, a pin on the arm operating in said slot, spring



actuated dogs carried by the rod to lock the pin in the slot, and a cam for releasing the dogs.

31. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, a rack and gear for moving the carriage part of its travel in one direction, a lever connected to the carriage, an arm for operating said lever, a gear, a rod connected at one end to the gear, and means for locking the rod to the arm when the carriage has completed a part of its movement in one direction to complete the movement of the carriage in said direction and return the carriage to its initial position.

32. In a printing machine, the combination of a magazine to hold a stack of address forms, a horizontally reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, a tray, and means for transferring said address form from its horizontal position on the carriage into the tray in upright position face forward after it has printed.

33. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, a bed for the address form on the carriage, a tray, means for tilting the bed to discharge the address form therefrom in an inclined direction, and means for guiding the address form to deliver it into the tray in an upright position face forward.

34. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage to carry a letter form and receive an address form from the magazine at each operation of the machine, and a tiltable bed on the carriage to support the address form during the printing operation and discharge it after said operation.

35. In a printing machine, the combination of a magazine to hold a stack of address forms, a reciprocating carriage, and a bed on the carriage to receive an address form from the stack and support it during the printing operation, said bed being hinged at its rear end to swing and discharge said form after it has printed.

36. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine, a bed on the carriage movable relatively thereto, means for supporting said bed to receive an address form from the magazine and support it in printing position, and means for causing said bed to tilt and discharge the

address form after it has printed and during the forward movement of the carriage to the magazine.

37. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a hinged bed on the carriage to support the address form in printing position, a track on which said bed travels during the printing operation, an inclined track on which said bed travels after the address is printed to permit the bed to swing and discharge said printed address, and a track on which said bed travels beneath the magazine.

38. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a hinged bed on the carriage to support the address form in printing position, a track on which said bed travels during the printing operation, an inclined track on which said bed travels after the address is printed, to permit the bed to swing and discharge said printed address, and guides to receive said printed address after it is discharged from the bed.

39. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a hinged bed on the carriage to support the address form in printing position, a track on which said bed travels during the printing operation, an inclined track on which said bed travels after the address is printed to permit the bed to swing and discharge said printed address, guides to receive said printed address after it is discharged from the bed, and a track to support said bed beneath the magazine.

40. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a swinging bed on the carriage for supporting said printing device during the printing operation, and means for causing said bed to swing downward after passing printing position and before reaching the magazine to discharge the printed address.

41. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a swinging bed on the carriage for supporting said address form during the printing operation, means for causing said bed to discharge the address form after it is printed,



guides to receive said address form, and means for moving said address form off of said guides.

42. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a swinging bed on the carriage for supporting said address form during the printing operation, means for causing said bed to discharge the address form after it is printed, guides to receive said address form, and a finger movable with said carriage for moving the address form off of said guides.

43. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a swinging bed on the carriage for supporting said address form during the printing operation, means for causing said bed to discharge the address form after it is printed, guides to receive said address form, and a finger carried by the bed for moving the address form off of said guides.

44. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a bed on the carriage to support the address form during the printing operation, means for causing said bed to discharge the address form after it has printed, a tray, means for supporting the tray to receive the address form after it is discharged from the bed, and means actuated by the carriage on its return movement to pack the address forms in the tray.

45. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a bed on the carriage to support the address form during the printing operation, means for causing said bed to discharge the address form after it has printed, a tray, means for supporting the tray to receive the address form after it is discharged from the bed, a packer mounted on the machine and operating in said tray, and a lever carried by said carriage to operate said packer to pack the address forms in the tray.

46. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and said magazine to receive an address form from the magazine, a bed on the carriage to support the address form during the printing operation, means for causing said bed to discharge the address

form after it has printed, a tray, means for supporting the tray to receive the address form after it is discharged from the bed, a packer comprising a bell-crank lever pivoted on the frame of the machine, one arm of said lever arranged to operate in the tray and the other arm having a socket, and a spring-pressed lever carried by the carriage and arranged to enter said socket on the return movement of the carriage to swing said bell-crank lever and pack the address forms in the tray.

47. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and the magazine to receive an address form from the magazine, a swinging bed supported on the carriage and supporting an address form during printing operation, a horizontal track on which the said bed travels during the printing operation, a horizontal track on which the bed is supported beneath the magazine, and inclined tracks on which the bed travels while moving from said first mentioned horizontal track to the other horizontal track.

48. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and the magazine to receive an address form from the magazine, a swinging bed on the carriage for holding an address form during the printing operation, a horizontal track on which the bed travels during the printing operation, an inclined track on which the bed travels while swinging to discharge the address form after it has printed, and means for guiding the bed on to said inclined track.

49. In a printing machine, the combination of a magazine to hold a stack of address forms, a carriage reciprocating between printing position and the magazine to receive an address form from the magazine, a swinging bed on the carriage for holding an address form during the printing operation, a horizontal track on which the bed travels during the printing operation, an inclined track on which the bed travels while swinging to discharge the address form after it has printed, a horizontal track on which the bed is supported beneath the magazine and on its return movement to said first mentioned horizontal track, and a switch in said last mentioned track.

50. In a printing machine, the combination of a reciprocating carriage, printing forms carried by said carriage, a spring roller on the frame of the machine beyond printing position, a ratchet roller at the front end of the carriage, a ribbon attached at its ends to said rollers, and means for automatically feeding said ribbon at each operation of the machine.

51. In a printing machine, the combina-



tion of a reciprocating carriage, printing forms carried by said carriage, a spring roller on the frame of the machine beyond printing position, a ratchet roller at the front end of the carriage, a ribbon attached at its ends to said rollers, ratchet mechanism on said ratchet roller, an arm connected to said ratchet mechanism, and means for swinging said arm to operate said ratchet mechanism at each operation of the machine.

52. In a printing machine, the combination of a reciprocating carriage, printing forms carried by said carriage, an inked ribbon stretched across and through which said forms print, and a feed roller movable bodily and intermittently relative to the carriage into operative position to feed a sheet of paper into printing position.

53. In a printing machine, a number of address forms, means for bringing said address forms successively into printing position, three separate salutation forms, means for automatically moving the proper salutation form into printing position as each address requires, and a ribbon through which said forms print.

54. In a printing machine, a number of address forms, means for bringing said address forms successively into printing position, three separate salutation forms, means operated by an address form for moving the proper salutation form into printing position as such address requires, and a ribbon through which said forms print.

55. In a printing machine, a number of address forms, means for bringing said address forms successively into printing position, three separate salutation forms arranged end to end, means for moving the proper salutation form into printing position as each address requires, and a ribbon through which said forms print.

56. In a printing machine, a number of address forms, means for bringing said address forms successively into printing position, a plurality of separate salutation forms, one of said salutation forms being normally in printing position, and the others being arranged on opposite sides of said salutation form normally in printing position, and means for automatically moving said salutation form out of printing position and one of the other salutation forms into printing position when required by the address form to be printed.

57. In a printing machine, a number of address forms, a reciprocating carriage for moving said address forms successively into printing position, a movable support, three separate salutation forms on said support, means for automatically moving said support to bring the proper salutation form into printing position as each address requires, and a ribbon through which said form prints.

58. In a printing machine, a number of

address forms, a carriage for moving said address forms successively into printing position, a movable support, three separate salutation forms on said support, and tumblers actuated by the address forms to operate said support and move into printing position the salutation required by the address form.

59. In a printing machine, the combination of a reciprocating carriage carrying a form to be printed, a ribbon through which said form prints, a discharge table arranged above the carriage and at an angle thereto, means for feeding the sheet to be printed to printing position and on to said discharge table, an ink pad at one side of the discharge table, a stamp normally engaged with said ink pad, and automatic means for moving said stamp in the arc of a circle to engage the sheet while on the discharge table.

60. In a printing machine, the combination of a reciprocating carriage carrying a form to be printed, a ribbon through which said form prints, a discharge table arranged above and at an angle to the carriage, means for feeding the sheet to be printed to printing position and on to said discharge table, means for supporting the sheet in an inclined position and stationary on said discharge table, and a stamp automatically operated to print on said sheet while on the discharge table.

61. In a printing machine, the combination of a reciprocating carriage carrying a form to be printed, a ribbon through which said form prints, a discharge table above the carriage, means for feeding the sheet to be printed to printing position and on to said discharge table, and a stamp automatically operated to print on said sheet while on said discharge table.

62. In a printing machine, the combination of a number of address forms, a reciprocating carriage for moving said address forms successively into printing position, a fixed letter form carried by said carriage, a plurality of salutation forms, and means for automatically moving the proper salutation form into printing position as each address requires.

63. In a printing machine, the combination of a number of address forms, a reciprocating carriage for moving the address forms successively into printing position, a fixed letter form carried by the carriage, a plurality of separate salutation forms carried by the carriage, and means for automatically moving the proper salutation form into printing position as each address requires.

64. In a printing machine, the combination of a number of address forms, a reciprocating carriage for moving said address forms successively into printing position, a fixed letter form carried by the carriage, a



plurality of separate salutation forms, means for automatically moving the proper salutation form into printing position as each address requires, and a ribbon through which  
5 all of said forms print.

65. The combination of a reciprocating printing member and a rotary impression platen, a fabric adapted to pass between them and having one end carried by the  
10 printing member, a spring barrel carrying the other end of the fabric, whereby the fabric winds on and off the spring barrel with each complete reciprocation of the member, and means for periodically feeding the  
15 fabric.

66. The combination in a duplicating machine, of a type carrying member and a co-operating platen, a printing fabric adapted to pass between them, a ribbon spool carried  
20 by the printing member, a spring barrel, a ribbon running from the spring barrel to the ribbon spool and traveling on and off the

spring barrel with each complete operation of the machine, and means for periodically and partially rotating the spool to wind the  
25 ribbon.

67. The combination in a duplicating machine, of a type carrying member and a co-operating platen, a printing fabric adapted to pass between them, a ribbon spool carried  
30 by the printing member, a spring barrel, a ribbon running from the spring barrel to the ribbon spool, and traveling on and off the spring barrel with each complete operation of the machine, means for periodically and  
35 partially rotating the spool to wind the ribbon, and means for periodically moving the impression platen into and out of coöperation with the printing member.

JOSEPH S. DUNCAN.

Witnesses:

WM. O. BELT,  
M. A. KIDDIE.