W. J. RENNIE.

LINOTYPE MACHINE.

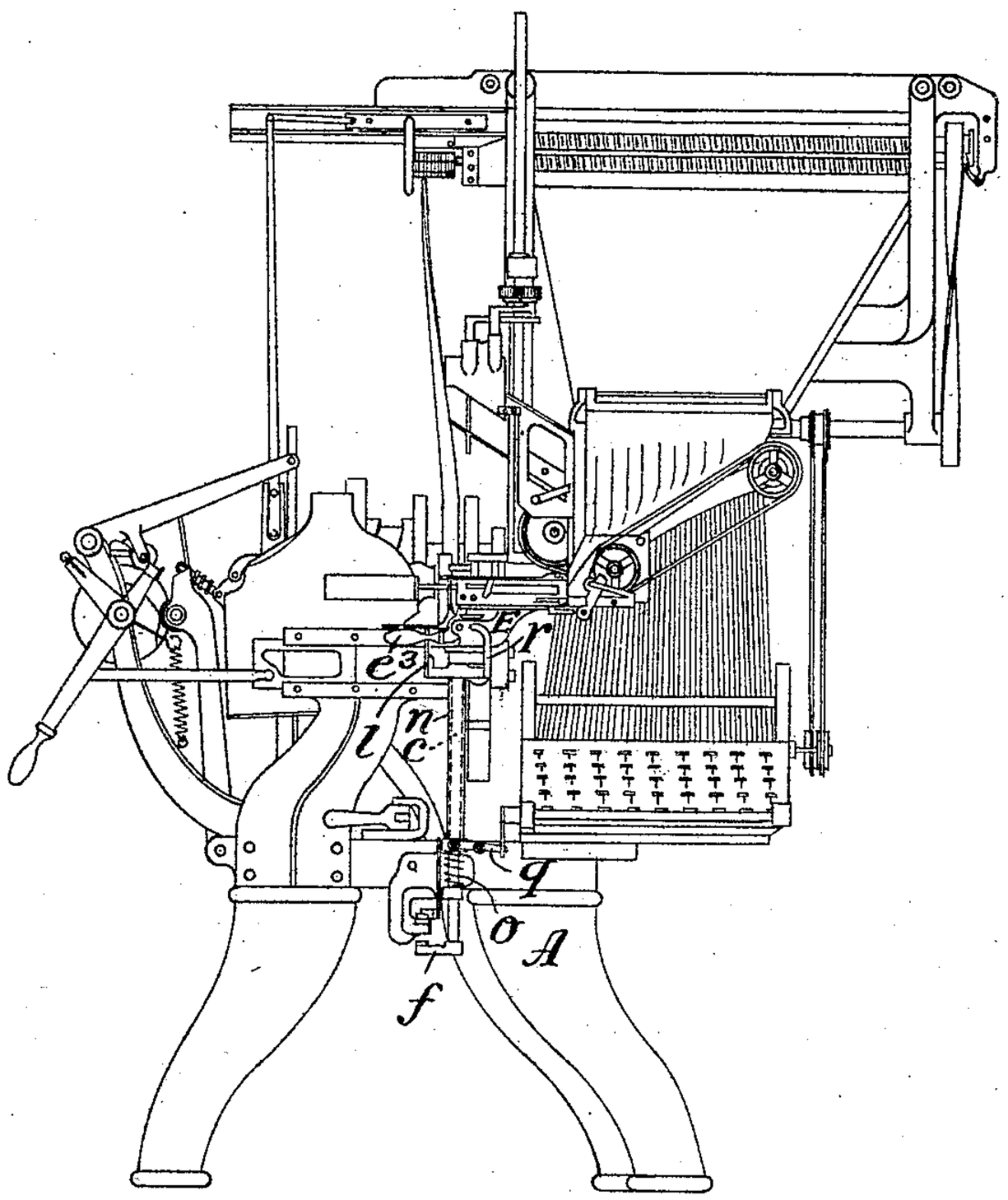
APPLICATION FILED JULY 9, 1907.

945,046.

Patented Jan. 4, 1910.

3 SHEETS—SHEET 1.

Fig. 1.



Attest:

Louis L. Varney.

Marjorie Rollins

Inventor:

William James Rennie

by

Redding Riddle & Grey, his Atty.

ANDREW, B. GRAHAM CO., PHOTO-LITHOGRAPHERS, WASHINGTON, D. C.

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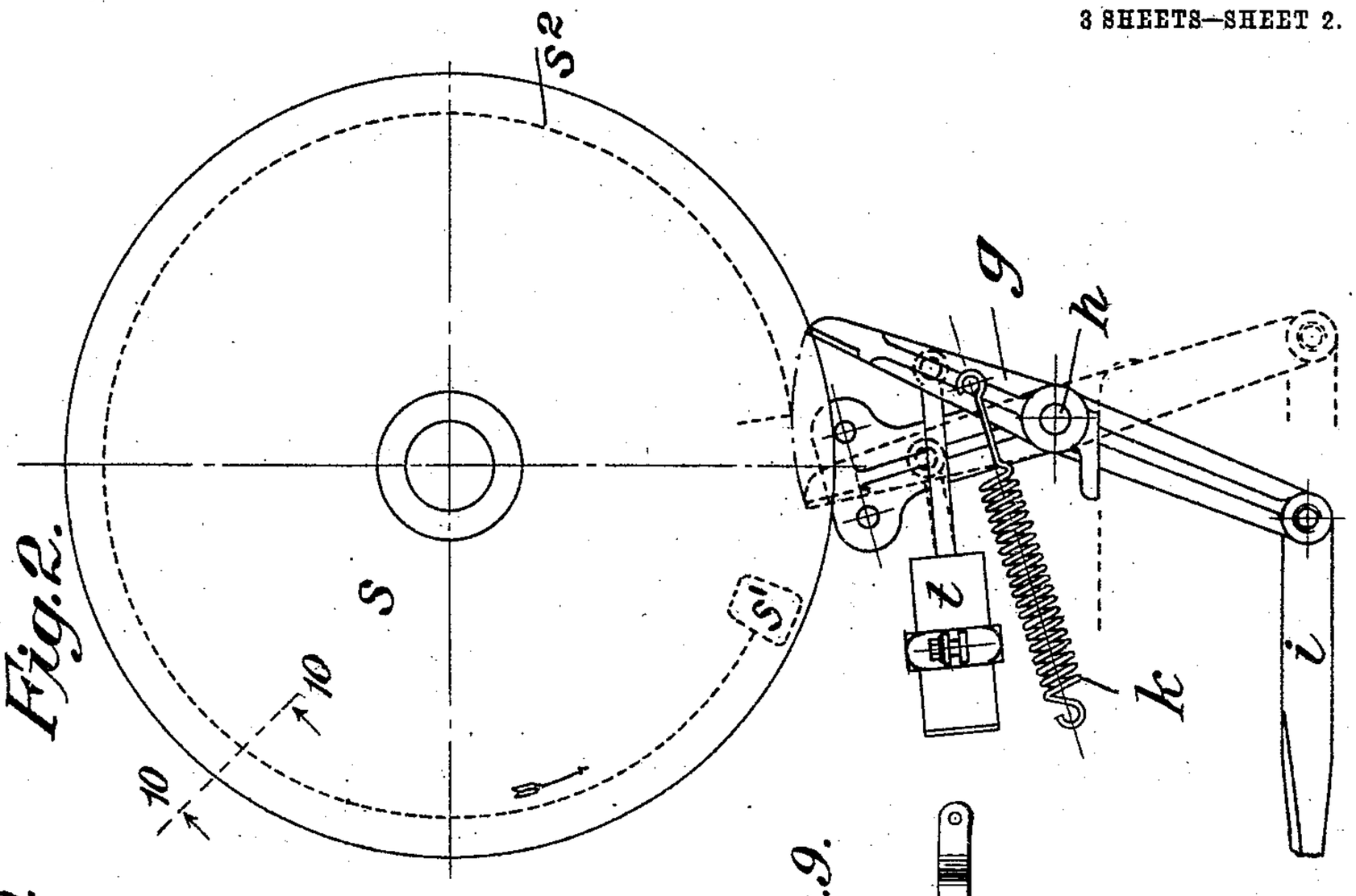

Fig. 2.

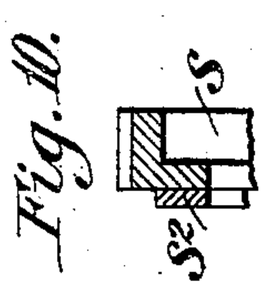

Fig. 10.

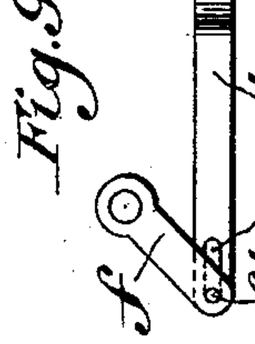

Fig. 9.

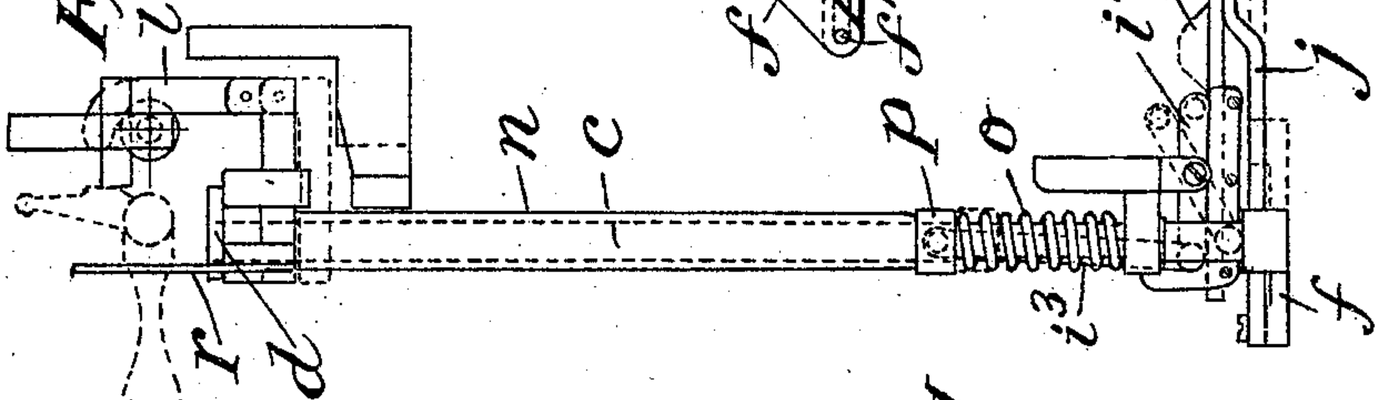

Fig. 4.

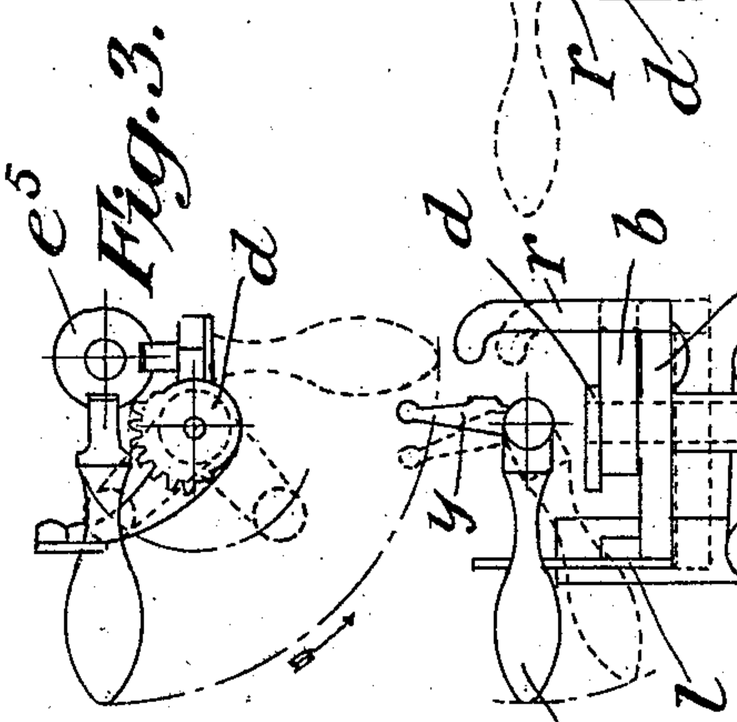

Fig. 3.

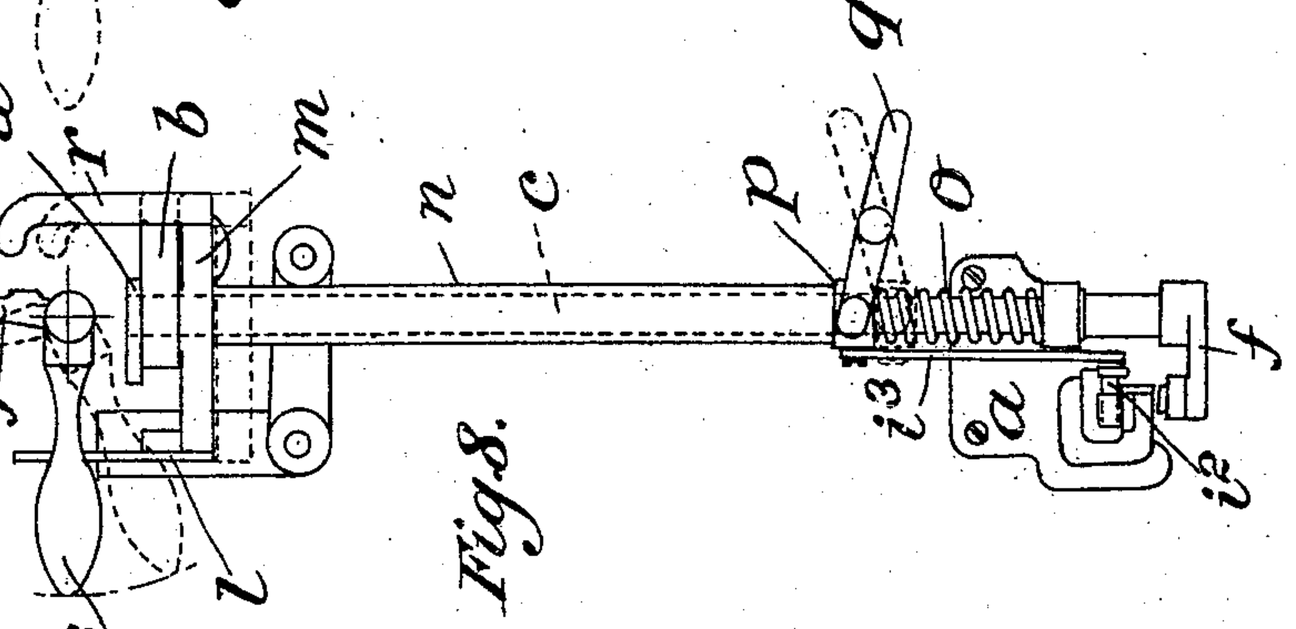

Fig. 8.

Attest:
Lucius E. Varney
Marjorie Rollins

Inventor:
William James Rennie
by
Redding Siddall & Greeley, his Attys.

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3 SHEETS—SHEET 3.

Fig. 6.

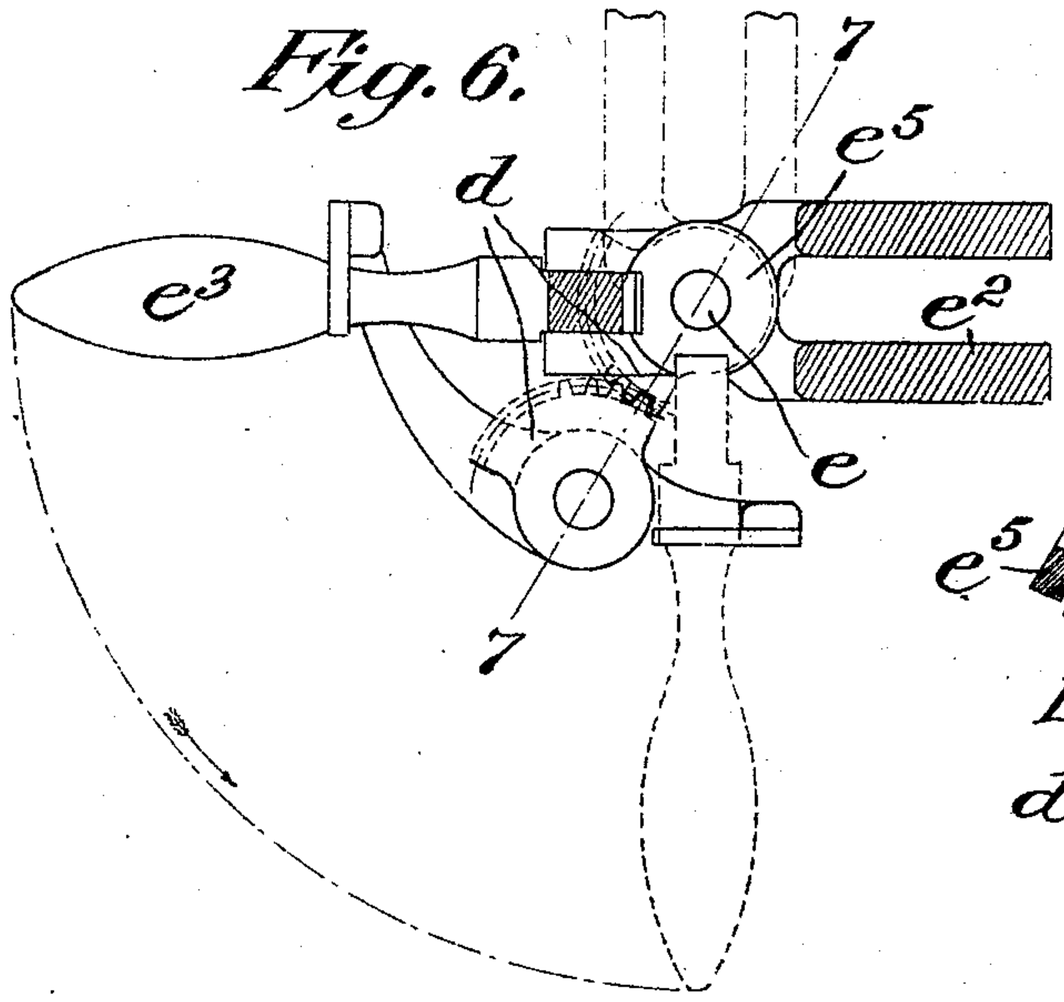


Fig. 7.

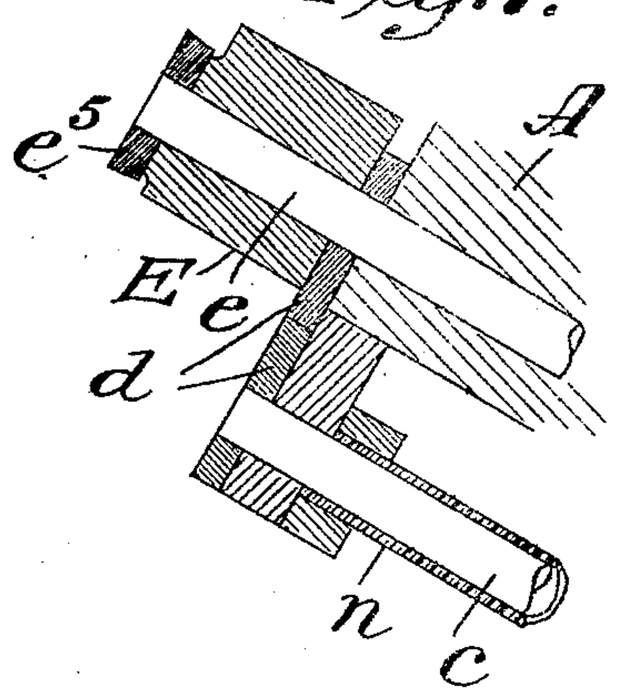
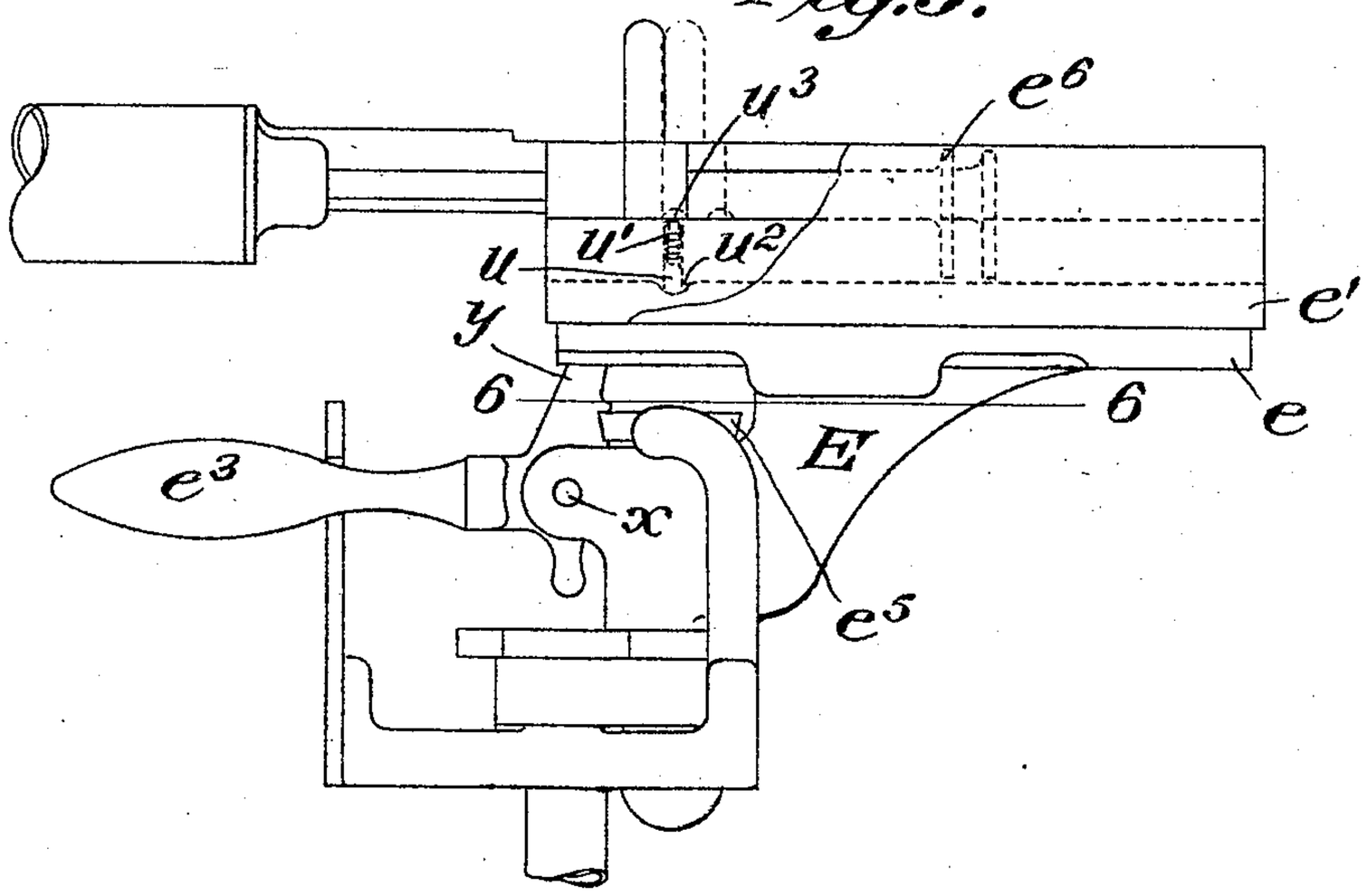


Fig. 5.



Attest:

Blair L. Darcy

Marjorie Rollins

Inventor:

William James Rennie

by

Redding Ridout Gray his Attys.

UNITED STATES PATENT OFFICE.

WILLIAM JAMES RENNIE, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO MERGENTHALER LINOTYPE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

LINOTYPE-MACHINE.

945,046. Specification of Letters Patent. Patented Jan. 4, 1910.

Application filed July 9, 1907. Serial No. 382,830.

To all whom it may concern:

Be it known that I, WILLIAM JAMES RENNIE, a citizen of the Dominion of Canada, and a resident of the city of Montreal, in the Province of Quebec and Dominion of Canada, have invented certain new and useful Improvements in Linotype-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

This invention relates particularly to the assembling devices of linotype machines, that is the parts of these machines in which the matrices and spacers are formed into lines of predetermined length which lines are subsequently ejected from the assembling devices for casting against.

The invention has to do more particularly with assembling devices which are mounted to turn from the position in which the matrices and spacers are received to the position in which the line is discharged, such as the assembling devices, for instance, shown and described in Letters Patent of the United States, No. 734,746, dated July 28, 1903.

The general object of the invention is to simplify the operation of these assembling devices with a view toward relieving the operator of the fatiguing process of turning the assembler box from one position to another, that is from its receiving position to its discharging position and vice versa, and toward accuracy of alinement between the assembler and adjacent parts, as well as toward economy of time and thought upon the part of the operator.

Upon reference to Letters Patent of the United States, No. 734,746, above referred to, it will be seen that the operator, after completing the assembling of a line in the assembler box, has to depress a handle to release the assembler box from its interlocking with the adjacent parts and then to turn the assembler, through said handle, to its discharging position where the handle is raised or released by the operator to set the transferring devices in action. It has been found in the use of such a machine, that this process is not only very fatiguing to the operator but that it involves a considerable expenditure of time and the operator rarely brings the assembler box into its exact alining position.

In accordance with the present improvements, the turning of the assembler box is effected by power operated devices which are set in action and are controlled automatically and which serve to move and maintain the assembler in the exact alining positions, to relieve the operator of the burden of constantly moving the assembler from one position to another and to eliminate entirely the personal equation of the operator. Moreover, besides the provision of such automatically controlled and power operated devices, means are provided for checking the delivery of an incomplete line from the assembler box whereby the operator's attention will be called to the fact that the assembled line he is about to deliver has not the required length.

All of the improvements will be described in detail hereinafter and in connection with the accompanying drawings in which,

Figure 1 is a view in front elevation of a linotype machine containing said improvements. Fig. 2 is a view in front elevation, on a larger scale, of some of the mechanism employed to turn the assembler box. Fig. 3 is a plan view of said mechanism. Fig. 4 is a view in side elevation of said mechanism, showing also additional parts of the mechanism. Fig. 5 is a view in elevation of the assembler, partly broken away, and illustrating the relation thereto of the mechanism for moving the same, this view being on a still larger scale. Fig. 6 is a sectional view taken upon the plane indicated by the line 6—6 in Fig. 5, and, Fig. 7 is a sectional view taken upon the plane indicated by the line 7—7 in Fig. 6. Fig. 8 is a view similar to Fig. 4, viewing the parts in a direction at right angles to the direction of the view in Fig. 4. Fig. 9 is a detail plan view of the parts shown at the lower end of Fig. 4. Fig. 10 is a detail sectional view of a portion of a cam, the section being indicated by the line 10—10 in Fig. 2.

The full lines in the drawings indicate the position of the parts when the assembler is in its receiving position and the broken lines indicate the position of the parts when the assembler has been moved into its discharging position.

The assembler box, or assembler as it will be called hereinafter, is indicated by the letter E and is mounted upon a vertical axis *e* (Fig. 7) secured in the frame of the machine

A. The assembler is provided with a handle e^3 pivoted thereto at x and having an upwardly extending portion y which engages the portion e' of the assembler. This portion e' of the assembler, in the present case, slides upon another portion e of the assembler and the sliding motion is effected by the depression of the lever e^3. The depression of the lever e^3 also unlocks or disengages the assembler from the adjacent parts of the machine, such locking being effected through the lever e^3 and a head e^5 which is provided with two slots or seats and which the upper portion of the lever e^3 is thereby adapted to engage when the assembler is in its receiving and discharging positions respectively (see Fig. 6). When the line of matrices and spacers has been completed and the line is thus fully assembled and ready for the casting, the handle e^3 is depressed thereby unlocking the assembler from the head e^5 and leaving it free to turn into the discharging position, illustrated in the broken lines in Fig. 6. In accordance with the present invention this turning is effected by means of power operated mechanism which is automatically controlled and which will now be described.

Mounted in suitable brackets a and b upon the frame of the machine is a shaft c which is operatively connected with the assembler through sector gears or the like d. The lower end of the shaft is provided with a crank arm f which is operatively connected with a lever g fulcrumed at h by intermediate connections such as a long link i and a short link j. To one arm of the lever g one end of a strong spring k is secured the other end being secured to a fixed part of the machine (not shown). When the parts are in the position shown in Fig. 4, the assembler is in its receiving position and the tension of the spring is transmitted through the lever g and intermediate connections to the shaft c which latter is thereby made to exert upon the assembler, through the gears d, a force properly directed to turn the assembler from its receiving to its discharging position. The assembler however, is held in its receiving position by being interlocked with the machine, as already explained, and for the purpose of unlocking the assembler, a hook l is provided, the curved end of which is seated above the handle e^3 when the assembler is in its receiving position. This hook l is connected through a cross piece m to a sleeve n upon the shaft c, which sleeve is normally supported upon a spring o coiled about the lower end of the shaft c. A collar p is provided upon the sleeve and a lever q having a forked end to engage the collar p is also provided whereby the attendant by raising the free end of said lever may depress the sleeve n against the action of the spring o, thereby disengaging the assembler from the machine through the hook l and the handle e^3. This, as will be obvious, will serve to place the assembler under the control of the power operated means just described for turning the same. As soon as the operator moves the lever q to disengage the assembler from the machine, he lets go of the lever q and the sleeve n rises again to its normal position under the action of the spring o. The lever e^3, during the turning movement of the assembler, remains in its depressed position on account of the upwardly extending projection y riding upon the periphery of the head e^5. As soon, however, as the assembler reaches its discharging position, the portion y of the handle e^3 drops into the other slot in the head e^5 (Fig. 3) and the handle e^3 rises. In this position a second hook r, secured to the cross piece m overlies said handle and serves, as soon as the sleeve n is again depressed, to depress the handle e^3 and release the assembler again from the head e^5.

In order to return the assembler to its first or receiving position, means are provided to automatically depress the sleeve n so as to relieve the assembler from its interlocking with the head e^5, as has just been explained, in order to eliminate the personal equation of the attendant, who might, if it were under his control, attempt to return the assembler to its receiving position, before the proper time. For this purpose a disk s is provided which carries a projection or step s'. This disk is suitably mounted upon the machine, and power is transmitted thereto so as to rotate it synchronously with the machine and in the direction of the arrow. The step s' engages the free end of the lever g and moves this lever from the position indicated in dotted lines in Fig. 4 back to the position indicated in full lines in said figure, always at the proper time and after a predetermined interval, according to the rotation of the disk s. The movement of the lever g causes the link i to move and said link i is provided with a cam wedge i' which engages a lever i^2, one end of which is connected through a link i^3 with the collar p. The connection of the link j with the crank arm f consists of a pin f^1 on arm f which engages in a slot j^1 in link j so that the first movement of the link i is not transmitted to the crank arm f; but when, through the operation of the cam wedge i', the sleeve n has been depressed and has caused the hook r to depress the handle e^3, the further movement of the arm i turns the shaft c and restores the assembler, as will be obvious, to its first or receiving position. A dash pot or some similar device t is preferably provided to ease or smooth the action of the spring k. The disk s is also provided with a strip s^2 which extends nearly around its periphery thus forming a cam against which the free

end of the lever g rests. By the provision of this strip, it is impossible for the lever g to move under the action of the spring k and thus turn the assembler from its receiving to its discharging position, until the lever g can pass said strip, as at the free open space just in front of the step or projection s'. It will thus be seen that this strip determines the moment of movement of the lever g and therefore of the turning of the assembler.

In order to prevent an incomplete or short line from being discharged from the assembler, a pin u is seated in the sliding portion e' of the assembler (Fig. 5) and is normally depressed by a spring u' into a recess u^2 having inclined sides. As the part e' is drawn backwardly upon the part e by the depression of the handle e^3, the pin u rides upon one of the inclined sides of the recess u^2 and is moved upwardly against the action of its spring u', its upper end seating itself in a recess u^3 which recess is provided in what are known as the sliding parts of the assembler. These sliding parts include a resistant e^6 which supports the forward end of the line of matrices and spacers, as the line is being assembled, and which serves to eject the assembled line from the assembler, when the assembler has been turned to its discharging position. When the line is completely assembled, it is of such a length as to bring the sliding parts into the position in which the recess u^3 is substantially above the pin u. In this way, the pin can be moved upwardly and out of the recess u^2, when the handle e^3 is depressed. If however the line is not completely assembled, that is, is shorter than the properly assembled line, the recess u^3 will not be substantially over the pin u and it will be impossible to depress the handle e^3 sufficiently to unlock the same from the head e^5 on account of the impossibility of raising the pin u from the recess u^2 in the portion e' of the assembler.

Various changes may be made in the construction and arrangement of the parts constituting the present improvements, and said improvements may be applied to other forms of assembling devices than those illustrated and described herein. It is not intended therefore to limit the invention to a structure such as is disclosed in the present specification.

I claim as my invention:

1. In a linotype machine, the combination of an assembler mounted to turn, power operated means to turn the assembler, and means to determine the moment of turning.

2. In a linotype machine, the combination of an assembler mounted to turn, power operated means to turn the assembler, and a cam operating in synchronism with the machine to determine the moment of turning.

3. In a linotype machine, the combination of an assembler mounted to turn, power operated means to turn the assembler, a cam in operative relation with said means, and a lever to place the assembler under the control of the power operated means.

4. In a linotype machine, the combination with an assembler mounted to turn from its receiving position to its discharging position, means to lock the assembler in its receiving position, power operated means to turn the assembler, means to unlock the assembler and place it under the control of said power operated means, and means to restore the assembler to its receiving position after it is turned.

5. In a linotype machine, the combination of an assembler, a vertical axis upon which it is mounted to turn, a spring and intermediate connections to turn the assembler, and means to restore the assembler to its first position through said intermediate connections.

6. In a linotype machine, the combination of an assembler mounted to turn, a handle pivoted upon the assembler and adapted to interlock with the machine to secure the assembler in a fixed position, power operated means to turn the assembler, and means to move the handle upon its pivot to release the assembler and place it under said power operated means.

7. In a linotype machine, the combination of an assembler mounted to turn, locking means for the assembler, a shaft through which to turn the assembler, a sleeve upon the shaft having means to disengage said locking means, and means adapted to turn the shaft as soon as the locking means have been disengaged.

8. In a linotype machine, the combination of an assembler, a vertical axis upon which it is mounted to turn, a vertical shaft, intermediate gears between the shaft and assembler, means pivoted upon the assembler for interlocking the same with the machine, a sleeve upon the shaft, operative connections between said means and sleeve, a spring to hold said sleeve normally in a position to permit the interlocking of the assembler and machine, power operated means to turn the shaft, and means to move the sleeve against the spring to unlock the assembler from the machine and place it under the control of the power operated means.

9. In a linotype machine, the combination of an assembler mounted to turn, power operated means to turn the assembler, a disk operated in synchronism with the machine, a strip upon the disk to prevent the operation of said means, and a projection upon the disk to return said means after they have operated.

10. In a linotype machine, the combination of an assembler mounted to turn, power operated means to turn the assembler from its receiving to its discharging position, and

means to effect the return of the assembler to its receiving position after a predetermined interval.

11. In a linotype machine, the combination of an assembler mounted to turn, power operated means to turn the assembler from its receiving to its discharging position, means to determine the moment of such turning, and means to return the assembler automatically to its receiving position after a predetermined interval.

12. In a linotype machine, the combination with an assembler, of means to discharge the assembled line from the assembler, and means to prevent said discharging means from operating except from a predetermined position.

13. In a linotype machine, the combination with an assembler having a relatively fixed portion, a sliding portion thereon and sliding parts, of means in the sliding portion to engage the fixed portion and prevent relative movement between said portions, and a recess in said sliding parts into which said means is adapted to move when said sliding parts are in a certain position.

14. In a linotype machine, the combination with an assembler having a relatively fixed portion, a sliding portion thereon, sliding parts, means to interlock the assembler with the machine, said means engaging the sliding portion of the assembler, a pin in the sliding portion of the assembler, said fixed portion and sliding parts each having a recess in which said pin is adapted to engage, and means to hold the pin normally in the recess in the fixed portion of the assembler.

This specification signed and witnessed this fifth day of July, A. D. 1907.

WILLIAM JAMES RENNIE.

Signed in the presence of—

WILLIAM H. SCHARFE,

GEORGE D. HARTLEY.