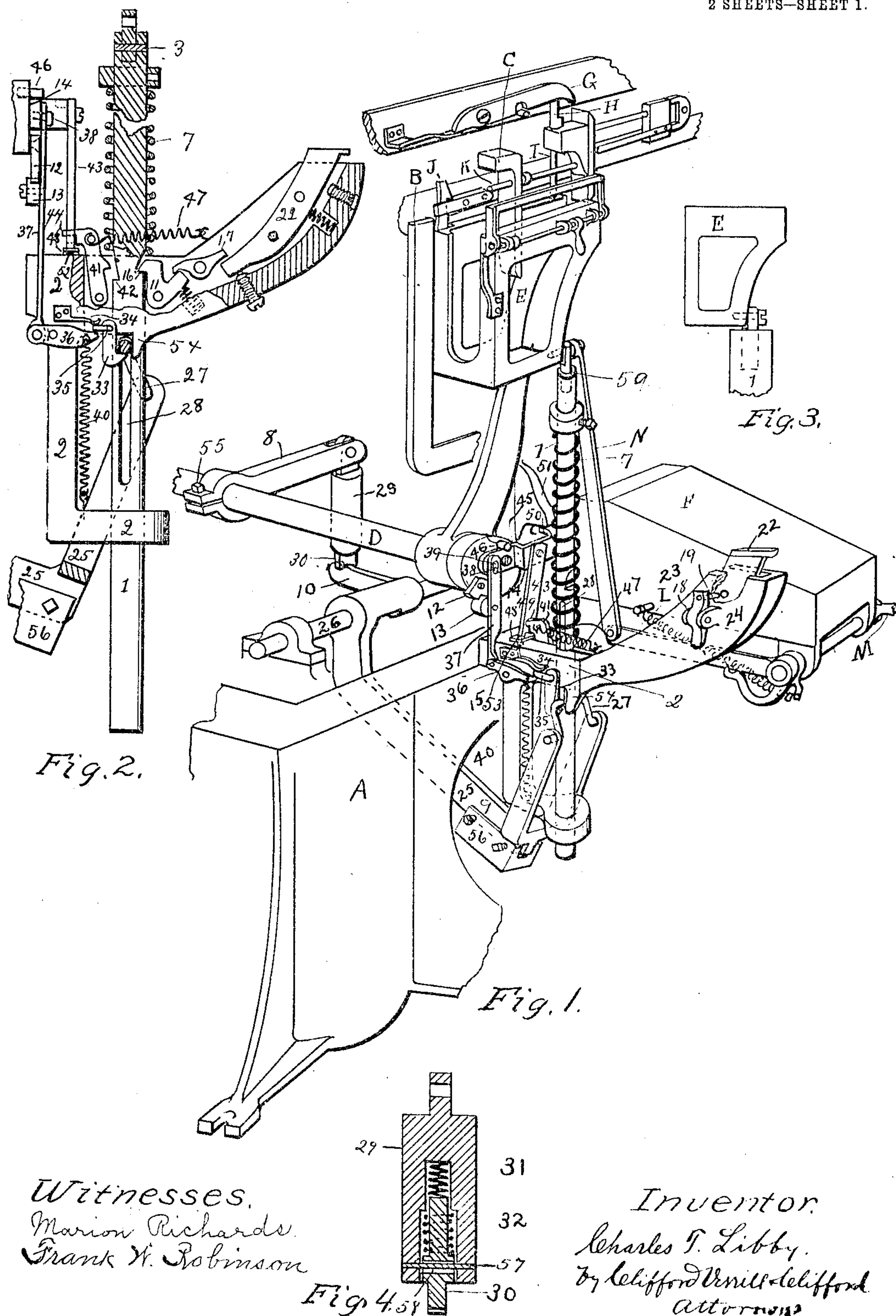


C. T. LIBBY.  
 LINOTYPE MACHINE.  
 APPLICATION FILED JUNE 19, 1903.

2 SHEETS—SHEET 1.



Witnesses.  
 Marion Richards.  
 Frank W. Robinson

Inventor.  
 Charles T. Libby.  
 By Leifford & Leifford  
 Attorneys

No. 832,397.

PATENTED OCT. 2, 1906.

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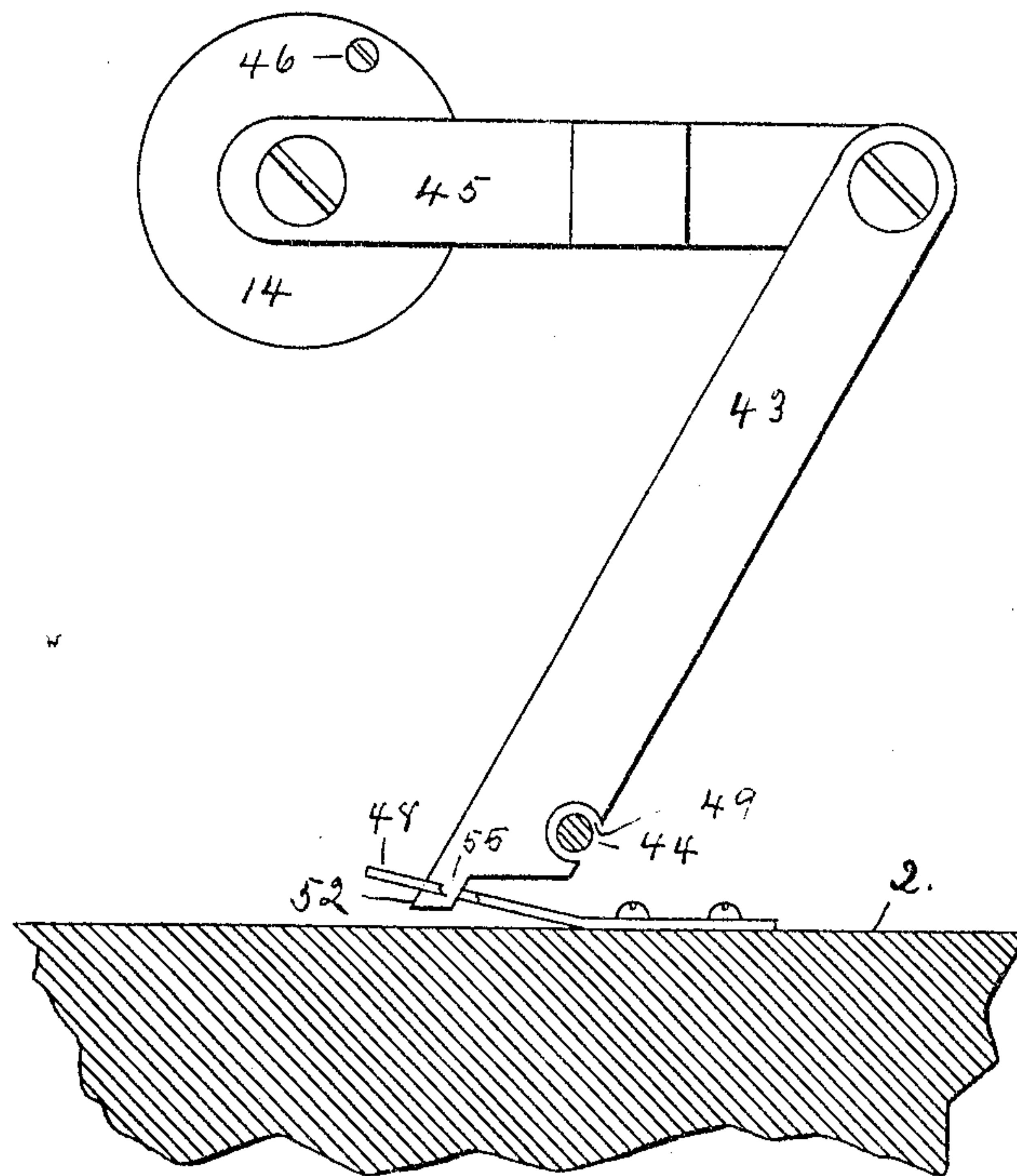


Fig. 5

WITNESSES:

*Lauren M. Sanborn,*  
*Marion Richards,*

INVENTOR:

*Charles T. Libby,*  
*by Clifford Verrill Clifford,*  
*Attorneys.*



# UNITED STATES PATENT OFFICE.

CHARLES T. LIBBY, OF PORTLAND, MAINE.

## LINOTYPE-MACHINE.

No. 832,397.

Specification of Letters Patent.

Patented Oct. 2, 1906.

Application filed June 19, 1905. Serial No. 152,225.

*To all whom it may concern:*

Be it known that I, CHARLES T. LIBBY, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Linotype-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in machines of the general character of the so-called "Mergenthaler Linotype-machine" shown and described in Letters Patent of the United States No. 436,532, dated September 16, 1890.

It relates to means for reciprocating the assembling-elevator by automatic actuating mechanism set in motion by the operator each time it acts.

It also relates to means for reciprocating the assembling-elevator by automatic actuating mechanism that runs continuously and independently of the operator.

It also relates to means for changing the machine from the former class to the latter and back again.

It also relates to means for controlling the automatic actuating mechanism and for bringing it into action at the will of the operator.

It also relates to certain details of construction hereinafter described and specifically explained.

The existing machine is started by the line-delivery carriage being released by the putting up of the assembling-elevator, which the operator does by a hand-lever each time he has assembled a matrix-line, and the machine automatically stops after casting the line thus sent up, unless the next line has already been sent up, in which case the start-and-stop nature of the machine is suspended. By my improved mechanism the assembling-elevator is put up automatically and is either set in operation by the operator each time he has assembled a matrix-line, or, at his option, the line-delivery-carriage shaft on its return, through intermediate mechanism, starts the assembling-elevator, thus making the machine constant running.

In the drawings herewith accompanying and making a part of this application, Figure 1 is a perspective view of a portion of the Mergenthaler machine, showing my improve-

ments applied thereto, the position of the several parts being that which they occupy at the instant the assembling-elevator releases the line-delivery carriage. Fig. 2 is a sectional detail view showing the position of the assembling-elevator-operating rod and the mechanism which controls and operates it, the parts being shown in ready position. Fig. 3 is a detail view of the top of the rod and the assembling-elevator. Fig. 4 is a detail sectional view of the pusher-bar which raises the rod-returning weighted lever, and Fig. 5 is a detail elevation of the automatic latch-releasing mechanism.

Same reference characters refer to like parts.

In said drawings, A represents the base; B, the front of the frame; C, the line-delivery carriage; D, the line-delivery-carriage shaft; E, the assembling-elevator; F, the keyboard; G, a pivoted latch for retaining the line-delivery carriage; H, the line-delivery-carriage-releasing pin; I, the needle on the assembling-elevator for operating said releasing-pin; J, the hook for supporting the assembling-elevator; K, the assembling-elevator-releasing bar; L, the assembling-elevator counterbalancing-spring; M, the assembling-elevator hand-lever, and N the assembling-elevator-lever link. These parts may be substantially the same and operate in substantially the same manner as in the aforesaid Mergenthaler machine.

In carrying out my invention I mount a vertically-reciprocating rod 1 in a suitable bracket 2, attached to the base or frame of the machine. The load is the assembling-elevator. The assembling-elevator is provided with a downwardly-extended post adapted to set loosely in a hole 3 in the top end of the rod. This arrangement prevents lateral motion of the elevator, but leaves it free to be raised by hand independently of the rod. This is convenient in caring for the adjustments and cleaning the machine and sometimes in shaking the matrices into alignment.

If preferred, the assembling-elevator may be secured to the operating-rod by a pin 3 passing through the rod and post, as shown in Fig. 2, or in any other convenient manner, in which case the latch 33 and its operating mechanism may be omitted, as in that case the assembling-elevator, rod, link, and weighted lever would all hang from the hook J until the proper moment for them to go



down. Upon said rod I mount a coil-spring 7, tending constantly when under compression to lift the rod and the assembling-elevator. I retain the assembling-elevator-lever link and its connections in order to retain the assembling-elevator balancing-spring L as in the existing machine; but I offset said link to the right, so as to make room for said rod under the assembling-elevator, as shown in Fig. 1. By increasing its efficiency either spring 7 or spring L can alone be made to do the entire work of raising the elevator, the other spring being omitted; but for the sake of the much greater facility of adjustment two springs should be used. The rod is returned to its down or ready position against the force of the spring by means of a weighted lever 25, operated as hereinafter described and having oppositely-extending arms 9 and 10. It is locked down or in ready position by means of latch 11 engaging an offset in the rod, which latch is adapted to be released by a key-lever 22, acting upon said latch either directly or through an intermediate reversing-lever 17; but note the contemporaneous action of the back latch hereinafter described. Latch 11 may be locked permanently out of engagement with the rod by means of a clasp 18, pivoted to the bracket and carrying a pin 19, adapted to be moved into and out of engagement with the key-lever. When the front latch 1 is thus locked out, the machine runs with the back latch only, as hereinafter described.

The rod is returned to its lower position by means of a weighted lever 25, loosely journaled on a counter-shaft 26, said weight-lever having a weight 56 adjustable thereon. The weighted arm 9 of the lever may be attached to the rod by means of a pivoted link 27, attached to the bifurcated end of the lever and passing through an elongated slot 28 in the rod, the weight of the weighted lever being sufficient to overcome the opposing force of the spring under its load. The opposite arm 10 of lever 25 extends into the path of a pusher 29, pivotally secured to an arm 8, rigidly but adjustably secured upon the line-delivery-carriage shaft by a clamping-screw 55, the action of said shaft being a rocking motion to the left and return. The pusher 29 has a contact 30 supported in the pusher by means of a pin 57 passing through a slot 58 and is held yieldingly projecting downwardly by means of two buffer-springs, one, 31, the lighter, and always operative and the other, 32, heavier and beginning to operate only after the former has been slightly compressed. This construction aids the contact 30 to slip lightly into its position on the weighted lever while only under the tension of the lighter buffer-spring. The downward movement of pusher 29 raises the weighted end of the lever, the link rising in the slot in the rod. Any lateral thrust of the link im-

parted to it by the latch is received by a spur 54 on the bracket instead of by the rod. The weighted end of the lever is sustained in elevated position by latch 33, pivotally secured to the bracket. A flat spring 34, secured to the bracket, tends to hold the latch in engagement with the link by pressing downwardly upon a rearwardly-extending offset 35, attached to the latch, as seen in Fig. 1. The link is released to allow the weighted lever to return the rod when the matrix-line has passed out of the assembling-elevator by means of a pivoted lever 36, pivotally attached to the bracket, one end of said lever adapted to press upwardly against arm 35 of latch 33. The other end is secured to a push-bar 37, adapted to be operated by a cam 12 engaging a cam-roll 13, secured to the push-bar, said cam being secured to the line-delivery-carriage shaft. The upper end of bar 37 is for convenience secured to a loose lever 45, hereinafter described, by means of a pin 38 passing through an elongated slot 39 in the push-bar. A spring 40 tends constantly to hold the push-bar up with yielding tension. The movement of the line-delivery-carriage shaft to the left disengages latch 33 by pushing down bar 37 upon lever 36.

When it is desired to have the machine operate continuously instead of being set in motion by the operator striking the key-lever each time after he has assembled a matrix-line, latch 11 is locked out of engagement with the rod. In this case the rod is held down by a pivoted latch 41 engaging an offset 42 in the back of the rod. Latch 41 is disengaged from the rod by means of a push-bar 43, one end engaging a lug 44 on the latch and the other pivotally secured to a lever 45, loosely mounted upon the end 14 of the line-delivery-carriage shaft and in the path of an eccentric-pin 46 in the head of the shaft and above the lever, whereby the return movement of the line-delivery carriage causes said pin to engage the loose lever, and thus to force down the push-bar which operates the latch. As a safety precaution to prevent the push-bar 43 lifting from the latch when the line-delivery-carriage shaft moves to the left in case the loose lever 45 should stick on its pivot by the parts being allowed to go uncoiled the lug on the latch is made to pass through a recess 49 in the bar. As a further precaution for the same purpose the outer end of the loose lever may carry a shoulder 50, bent back and reaching under a projecting part 51 of the machine. A spring 47 tends constantly to hold the latch 41 in engagement with the rod. The foot of push-bar 43 rests upon a flat spring 48, which sustains its weight and that of the loose lever, whereby spring 47 may be comparatively weak, thus lessening the friction of the back latch against the rod as the rod descends. A projection 52 on the bottom of push-bar 43



projects through a hole 55 in the spring, thus preventing lateral movement of the push-bar.

The machine thus constructed may be operated in three ways:

First, when the operator touches a key every time a line is ready. In this case the machine is in ready position when the weight-lever is up and latched, the rod down and latched by the front latch, the back latch being at this point in the cycle of movement unlatched. Striking the key disengages the front latch, and as the back latch is already automatically unlatched the spring, being released, is free to act, and the rod goes up, carrying the elevator. As the rod goes up the link pivotally attached to the weight-lever traverses the slot in the rod; but the bottom of the slot does not quite reach it. As the elevator arrives up, releasing the line-delivery carriage, as in the existing machine, the line-delivery carriage starts over its rocking shaft, turning to the left, and the weight-lever-operating pusher rises, leaving the back end of the weight-lever behind. The back end of the weight-lever stays down, because its front end is sustained by the latch engaging the link connecting the weight-lever and the rod. The elevator stays up suspended by its hook until the line of matrices has passed out of the assembling-elevator. At this point two things happen. The assembling-elevator is released. At the same instant the latch which sustains the weight-lever is disengaged. The weight-lever carries the rod down, having sufficient weight to overcome the opposing force of the spring, the weight of the elevator aiding and falling with it by gravity. Upon the drop of the rod it remains down by force of three things—namely, the two rod-locking latches and the weight-lever. The weight-lever is first released, which takes place when the weight-lever pusher 29 gets far enough back to engage the short end of the weight-lever, thereby raising its link from the bottom of the slot in the rod. Next the back latch is released when the line-delivery carriage is almost back by reason of the eccentric-screw engaging the loose lever attached to the line-delivery-carriage shaft, which through intermediate mechanism disengages the latch. The apparatus is now again in ready position, the rod being held by the front latch only, the weight-lever sustained by its latch, and the back latch automatically thrown out.

The second method of operation is when the operator hits the key before the line-delivery carriage gets back. The result of this is different at different points. If he hits the key while the weight-lever is still way down, nothing happens, and he must hit the key again later on. If, on the other hand, he hits the key after the pusher has engaged

and lifted the weight-lever from the bottom of the slot, which happens when the line-delivery carriage is about three-fifths on its return back, the rod then rises slightly, sufficient to prevent the reengagement of the front latch, and remains held by the back latch, which situation continues until the back latch is thrown out by the eccentric-screw engaging the loose lever as before, which happens just at the right time by adjustment of the eccentric-screw for the assembling-elevator to start up without getting into the path of the line-delivery carriage.

The third method of operation is when the key-lever is locked down, thereby locking the front latch out of action. This leaves the rod held only by the back latch. The operation from this point is like the second method of operating the machine, as each return of the line-delivery carriage throws out the back latch, leaving the burden upon the operator to have his line ready to go up in readiness for that. If bad copy or other interruption prevents such readiness, the operator disengages the key-lever, thereby bringing the front latch again into operation. As long as the machine is running by the third method the operator must keep up with it, and if any interruption occurs by locking the key an instant change to the first method of operating the machine is effected.

This application covers certain varying constructions from my allowed application, Serial No. 197,782, allowed November 11, 1905. It does all the things that that apparatus does and also, first, holds up the assembling-elevator by and with the same force that originally carried it up until the matrix-line has passed out; second, double holding device for the elevator-raising mechanism holding simultaneously, released successively.

Many equivalent means may be substituted for the specific devices herein shown for these purposes, all of which are equally within the spirit and scope of my invention, and likewise the auxiliary mechanism for regulating and controlling the main features of my invention may be greatly varied, and I do not desire to be limited in these respects otherwise than as specifically set out in the claims.

The advantages of my improved machine are as follows: It is optional with the operator to have it either a constant-running or a start-and-stop machine. The former method is valuable to the large number of operators who are able to set news-measure to the full speed of the machine and who are thus saved the labor and nervous strain of putting up the assembling-elevator and watching the movement of the machine for the proper time of doing so—in fact, having nothing left to do but to be sure their line is set before the elevator goes up and then enjoying an in-



stant's relaxation and an opportunity to glance at copy while the assembling-elevator automatically goes up and returns. Furthermore, operators who are otherwise unable to set lines to the full speed of the machine will have their speed increased, because my improved machine will save all interruption of their attention to copy caused by using the hand-lever to put up the assembling-elevator, and the time while the elevator is passing up and back will enable them to be all ready to set the next line immediately the elevator is returned. Upon any interruption in completing a line of mats the operator may instantly change the machine to the start-and-stop form by throwing off the clasp.

Having thus described my invention and its use, I claim—

1. In a linotype-machine, in combination, the assembling-elevator, a rod adapted to carry said elevator, means tending constantly to raise said rod, the line-delivery carriage adapted to be started automatically by each upward movement of said elevator, means for detaining said rod in its lower position and means for automatically releasing said rod actuated by the line-delivery-carriage mechanism and operated in time therewith, whereby the raising of the elevator releases the line-delivery carriage and the reciprocation of the line-delivery-carriage mechanism releases the rod thus making the machine constant-running.

2. In a linotype-machine, in combination, the assembling-elevator, mechanism for reciprocating the same, the line-delivery carriage and its driving-shaft, means for holding said elevator-reciprocating mechanism down and means automatically actuated by the line-delivery-carriage shaft to release said elevator-reciprocating mechanism, whereby said machine is rendered constant-running.

3. In a linotype-machine, in combination, the assembling-elevator, mechanism for reciprocating the same, the line-delivery carriage and its driving-shaft, means for holding said elevator-reciprocating mechanism down and means automatically actuated by the line-delivery-carriage shaft to release it, another means for holding said elevator-reciprocating mechanism down and means for arbitrarily releasing it and means for fastening it out of action, whereby the use or non-use of said fastening means gives the operator the instant option to have the machine a start-and-stop machine or a constant-running machine.

4. In a linotype-machine, in combination, the assembling-elevator, a rod carrying said elevator having two shoulders, one higher than the other, mechanism adapted to raise the rod, mechanism adapted to return the rod, the efficiency of the latter, when both are oper-

ative, being the greater, mechanism for compressing, latching and releasing the latter mechanism, mechanism for latching and arbitrarily releasing the former mechanism by means of the upper of said shoulders, a hand-operated clasp adapted to lock the last-mentioned mechanism out of action, a latch to hold and release the latter mechanism out of action, a latch to hold and release the latter mechanism by means of the lower of said shoulders, the line-delivery carriage and its shaft, mechanism actuated by the latter to operate said latch, whereby either the assembling-elevator when arbitrarily released remains down until it is, or unless it already has been, released automatically by the movement of the line-delivery shaft and then is automatically actuated up and down, or at the pleasure of the operator by the use of the clasp the machine is rendered constant-running.

5. In a linotype-machine, in combination, the assembling-elevator, a rod carrying said elevator, means tending constantly to raise said rod, means tending normally to return said rod and hold it in its lower position and having power normally to do so, means for temporarily nullifying said rod-returning mechanism, the line-delivery-carriage-operating mechanism and means actuated by the line-delivery-carriage-operating mechanism for releasing said nullifying mechanism arranged to act at the time when the matrix-line has passed out of the elevator.

6. In a linotype-machine, in combination, the assembling-elevator, mechanism for raising and holding up the same, mechanism for lowering the same, the line-delivery-carriage shaft and mechanism intermediate between the line-delivery-carriage shaft and said lowering mechanism actuated by the former to start the latter at the moment when the matrix-line has passed clear of said assembling-elevator, whereby the assembling-elevator is held up by and with the same force that puts it up until the matrix-line has passed clear of the elevator, and thereupon automatically released.

7. In a linotype-machine, in combination, an assembling-elevator, means for raising said elevator, two independent mechanisms for holding said elevator down, one adapted to be released arbitrarily, the other automatically, and means by which the assembling-elevator when the former holding mechanism has been first released is still held down by the latter until automatically released.

8. In a linotype-machine, in combination, an assembling-elevator, a spring for raising the assembling-elevator, means for placing said spring under compression, a rod fastened to the moving end of said spring and engaging said elevator, two latches engaging said



rod, means for arbitrarily releasing one of said latches and means for automatically releasing the other of said latches, the release of both of said latches being necessary to effect the release of the spring.

9. In a linotype-machine, in combination, the assembling-elevator, a rod carrying said elevator having two shoulders, one higher than the other, mechanism adapted to raise said rod, mechanism adapted to return said rod, the efficiency of the latter, when both are operative being the greater, mechanism for bringing the rod-returning mechanism into operative position, latching it and releasing it, mechanism for latching and arbitrarily releasing the rod-raising mechanism by means of the upper of said shoulders, a hand-operated clasp adapted to lock the last-mentioned mechanism out of action, a latch to hold and release the rod-raising mechanism by means of the lower of said shoulders, the line-delivery carriage and its shaft, mechanism actuated by the latter to operate said latch, whereby the assembling-elevator, when arbitrarily released, remains down until it is, or unless it already has been, released automatically by the movement of the line-delivery shaft and then is automatically actuated up and down.

10. In a linotype-machine, an assembling-elevator, a rod adapted to carry said elevator and having two shoulders, one slightly higher than the other, rod-raising mechanism, rod-returning mechanism adapted alternately to raise and lower said rod, latches adapted to engage said shoulders and means for disengaging said latches from said shoulders successively.

11. In a linotype-machine, in combination with the assembling-elevator and automatic actuating mechanism therefor, the line-delivery-carriage shaft, a lever, means actuated by said shaft to operate said lever, a latch adapted to be disengaged by said lever, means to hold said latch in engagement, whereby the latch is disengaged in time to the movements of the line-delivery-carriage shaft.

12. In a linotype-machine, in combination with the assembling-elevator and automatic actuating mechanism therefor, the line-delivery-carriage shaft, a reciprocating rod, rod-returning mechanism, a latch adapted to hold said rod-returning mechanism inoperative, a spring tending to hold the latch in engagement and a push-bar operated by the line-delivery-carriage shaft through intermediate mechanism to disengage the latch, whereby the latch is operated in time to the movements of the line-delivery-carriage shaft.

13. In a linotype-machine, in combination, the assembling-elevator, mechanism for reciprocating the same, the line-delivery-carriage shaft, a cam on said shaft and means

actuated by said cam to regulate said reciprocating mechanism.

14. In a linotype-machine, in combination with the assembling-elevator and automatic actuating mechanism therefor, the line-delivery-carriage shaft, a push-bar, means by which said shaft operates said push-bar, a spring, a latch operated by the spring and push-bar, adversely, whereby the latch is operated in time to the movements of the line-delivery shaft.

15. In a linotype-machine, in combination with the assembling-elevator and automatic actuating mechanism therefor, the line-delivery-carriage shaft, a reciprocating rod, a latch adapted to engage said rod, means for holding said latch in yielding engagement with said rod, and a push-bar actuated by the line-delivery-carriage shaft through intermediate mechanism, to disengage said latch, whereby the latch is disengaged in time to the movements of the line-delivery-carriage shaft.

16. In a linotype-machine, in combination, an assembling-elevator, a spring tending to raise said elevator, mechanism having sufficient power, when operative, to return the elevator against the opposing force of said spring, a latch for holding said elevator-returning mechanism temporarily out of action and means for automatically throwing out said latch.

17. In a linotype-machine, the combination with an assembling-elevator-actuating motor, of holding means therefor comprising a plurality of catches adapted to jointly control the upgoing of the elevator and independent means, one of them automatic and actuated by a moving part of the machine, for tripping the catches.

18. In a linotype-machine, an assembling-elevator, elevator-raising mechanism, two jointly-acting means for holding said raising mechanism out of action and means for disengaging said two means, one of said disengaging means automatically actuated by a moving part of the machine, the other consisting of a manually-operated key and connecting mechanism.

19. In a linotype-machine, in combination, an assembling-elevator, mechanism for raising the same, two cooperating controls for the upgoing thereof, one arbitrary, one automatic.

20. In a linotype-machine, in combination, the assembling-elevator, mechanism for reciprocating the same, the line-delivery carriage and its driving-shaft, means for holding said reciprocating mechanism out of action and means automatically actuated by the line-delivery shaft to release same.

21. In a linotype-machine, in combination, the assembling-elevator, mechanism for reciprocating the same, two coacting but independent means both adapted to control the



upgoing of the elevator, one adapted to be automatically released by some moving part of the machine, the other adapted to be arbitrarily released, and means for fastening  
5 the latter holding means out of use.

22. In a linotype-machine, in combination, an assembling-elevator, mechanism for raising the same, two contemporaneously-operative controls, for the upgoing thereof, one  
10 automatic, one arbitrary and means for fastening the latter out of use.

23. In a linotype-machine, in combination, an assembling-elevator, mechanism for raising the same, two means for controlling the  
15 upgoing thereof both requiring to be released each time before the elevator goes up,

one controlling means being adapted to be released automatically, the other manually.

24. In a linotype-machine, the vertically-movable assembling-elevator and automatic  
20 actuating mechanism therefor, in combination with two controls for the upgoing thereof, one automatic one arbitrary, both coöperative to hold the elevator down and both released to let the elevator go up.

In testimony whereof I hereto affix my  
signature, in presence of two witnesses, this  
17th day of June, 1903.

CHARLES T. LIBBY.

In presence of—

ELGIN C. VENILL,  
MARION RICHARDS.