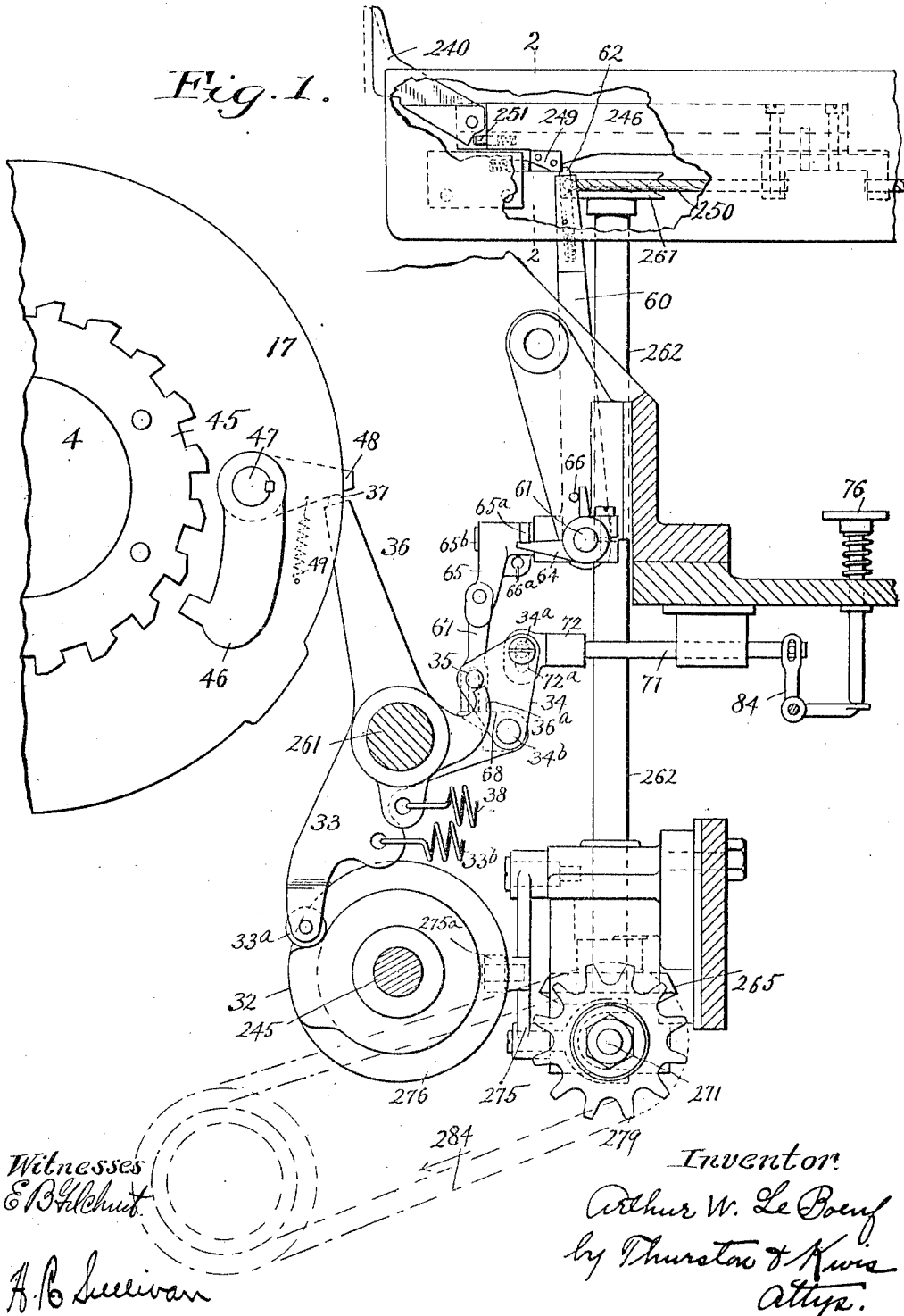


A. W. LE BOEUF.
 CASTING CONTROL MECHANISM FOR LINOTYPE MACHINES.
 APPLICATION FILED JULY 11, 1910.

1,061,388.

Patented May 13, 1913.

3 SHEETS—SHEET 1.

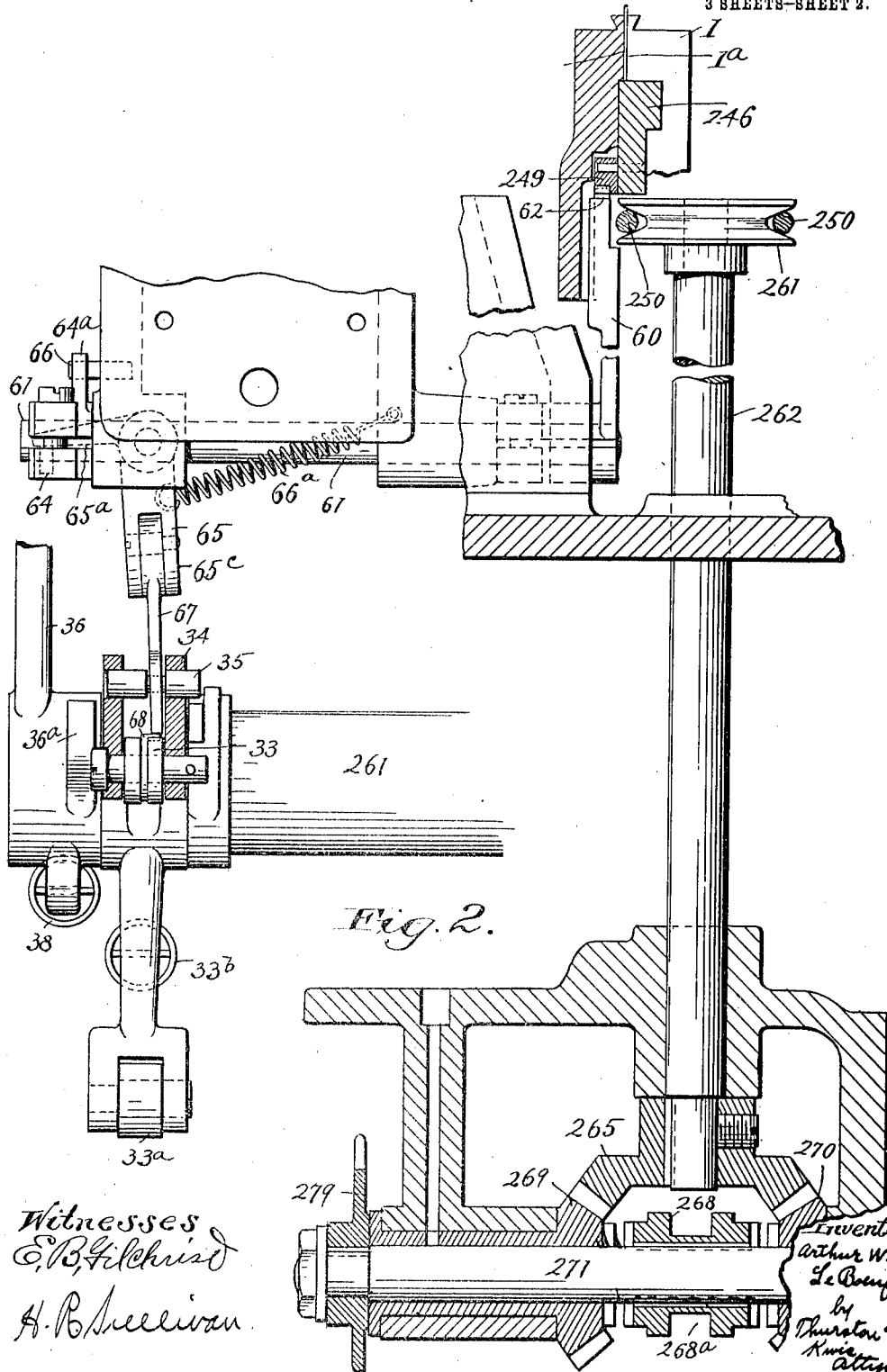


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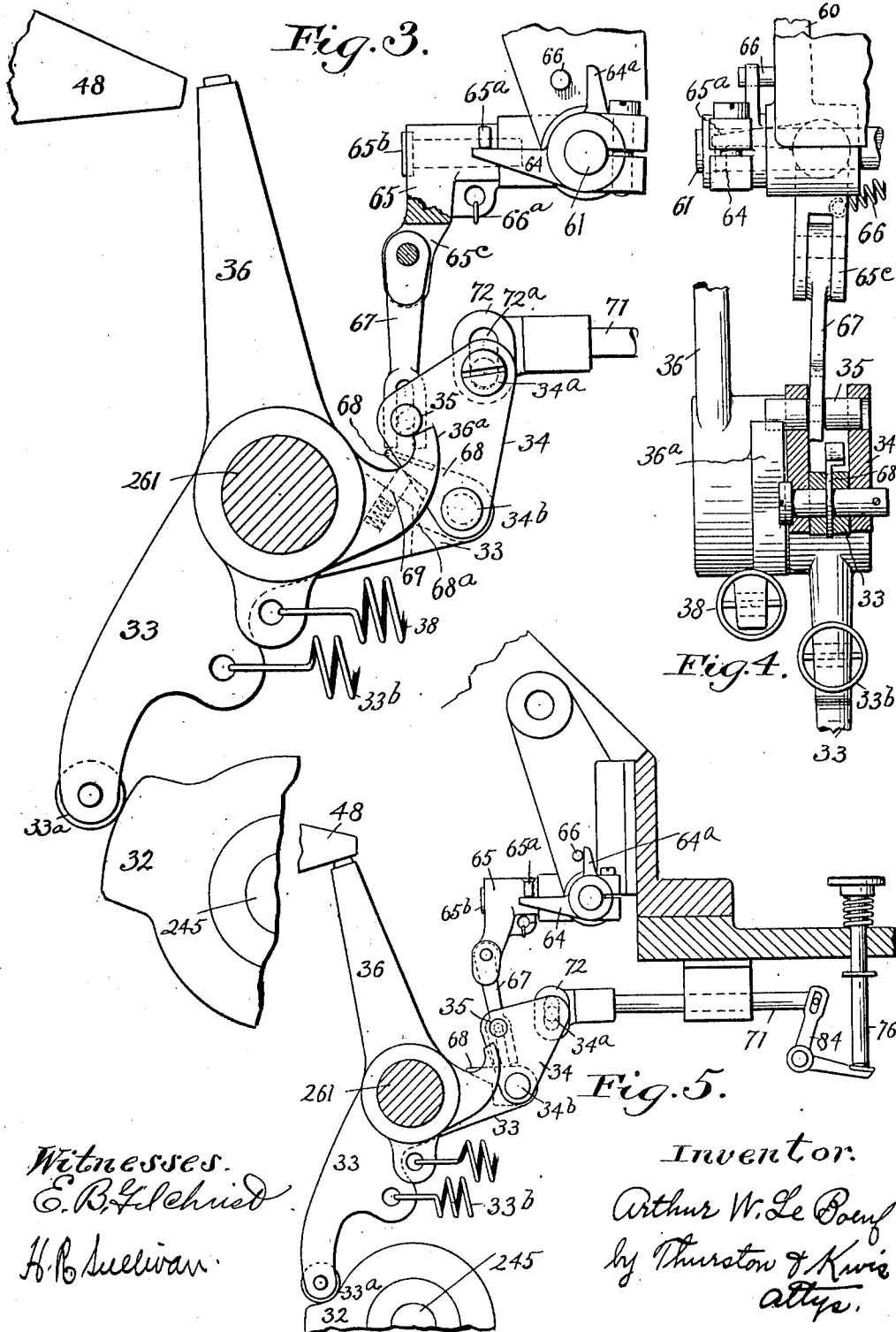


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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

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CASTING-CONTROL MECHANISM FOR LINOTYPE-MACHINES.

1,061,388.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed July 11, 1910. Serial No. 571,311.

To all whom it may concern:

Be it known that I, ARTHUR W. LE BOEUF, a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented a certain new and useful Improvement in Casting-Control Mechanism for Linotype-Machines, of which the following is a full, clear, and exact description.

10 In the kind of linotype machines to which the present invention is adapted, independent matrices and spacers are assembled in a line on what is commonly called an assembling rail. Then a device, generally referred to as a line carrier, pushes this line of matrices (and spacers) along to a definite position, where the line will come under the influence of other mechanism by which they are accurately placed and clamped in front of the mold. The clamped matrix line is then caused to close one side of the mold slot, and then molten type metal is injected into the mold slot for the purpose of making a linotype. After this the matrices are moved and automatically carried to the embrace of the matrix distributing mechanism. When everything works right, these various operations are carried on automatically and in proper sequence. If, however, the line carrier were to fail to carry the matrix line to the required position to be engaged and operated upon by the mechanism provided for that purpose, and if nevertheless the clamping mechanism, the casting mechanism and elevator mechanism were to operate in the ordinary way, the results would be a serious damage to the machine.

The present invention is particularly intended as a safe guard to prevent the operation of the said mechanisms, unless the line carrier has moved the line to the proper position.

The invention in the precise embodiment shown is especially contrived for use in connection with substantially such a linotype making machine as is shown either wholly or in part in various patents granted to the Electric Compositor Company as the assignee of different inventors. The Bellows

Patent No. 921,063, particularly in Figure 19, shows some of the mechanism which the present invention, in the particular embodiment shown in the drawing, is intended to allow to operate or to prevent operating, as circumstances require. The invention, however, is not necessarily restricted to an embodiment especially adapted for this machine.

In the drawings, Fig. 1 is a front elevation of the mechanism which constitutes the preferred embodiment of the present invention and some associated parts,—a part of a frame member being broken away, and other parts of the frame, and two shafts being sectioned. Fig. 2 is a sectional end view of said mechanism,—the section being on the line 2—2 of Fig. 1, when the line carrier is at the end of that movement by which it carries a matrix line to the casting mechanism. Fig. 3 is a front view of some of the parts shown in Fig. 1, showing their relative positions when the cam shaft has been released. Fig. 4 is a sectional side view of the parts as shown in Fig. 3; and Fig. 5 is a view similar to Fig. 3, except that it shows the position of the parts when the operator has intentionally thrown them into such position that the cam shaft will not be released.

Referring to the parts by reference numbers, 245 represents what is commonly known as the recorder shaft; and 4 represents what is known as the casting mechanism cam shaft. Both of these shafts are normally idle, but, at the will of the operator, the shaft 245 may be caused to make one complete revolution.

45 represents a ratchet wheel which is rotatably mounted upon the shaft 4 and is to be constantly rotated by any suitable mechanism. Fixed to the cam shaft is a disk 17 carrying a pawl 46 which is fixed to a rock shaft 47 mounted on this disk. This rock shaft is under the influence of a spring 49 tending to carry the pawl into engagement with said ratchet. A trip arm 48 is fixed to the rock shaft 47 in such position that as the disk 17 rotates it may strike the end of trip lever 36, wherefore the pawl

46 will be withdrawn from its engagement with ratchet wheel 45; and will be held in this idle position until the trip lever 36 is withdrawn. It is to be understood that this cam shaft 4 is one which carries various cams for operating the casting mechanism, and the mechanisms by which the matrix line is moved from place to place and utilized for the making of a linotype. It is to be understood that the recorder shaft, at a suitable part of its revolution will trip the release lever 36, and allow the pawl 46 to fly into engagement with the ratchet 45, whereupon the cam shaft 4 rotates and the various parts having to do with the casting of a linotype and the movement of the assembled matrix line, will operate in proper sequence.

The parts above described are substantially like the corresponding parts shown and described in Bellows's Patent No. 921,063. It will be understood by those familiar with this patent that this shaft 4 carries numerous cams which control the operation of the mechanism for clamping the line, for causing the matrix line to close one side of the mold, for ejecting molten metal into the mold, for ejecting the linotype, etc.; and that therefore, unless the shaft 4 turns, the matrix line will remain in the position to which the line carrier has moved it; and that none of the mechanisms, which include the line clamping mechanism, the casting mechanism, etc., will be operated. It may therefore be said that the specific object of the invention shown, is to prevent, either at will or automatically, as when the line carrier has not properly done its work, the operative connection of the said shaft 4 with means for turning it.

The assembling rail, on which the line of matrices are assembled, has a vertical slot 1^a through it. The line carrier slide 246 moves in guides on a frame member beneath this slotted rail, and has a thin arm 240 pivoted to its front end and extending upward and to the left therefrom through the slot 1^a; said arm being under the influence of a yielding spring plunger 251 to hold it up in the position to engage with the rear end of a matrix line. This slide 246 is connected as shown in said prior patent with opposite ends of a belt 250 which is driven by the driving pulley 261. This pulley is fixed to the upper end of the vertical shaft 262. The vertical shaft 262 is turned first in one direction and then in the other, or is allowed to stand idle, through the operation of a clutch sleeve 268 having clutch jaws on its ends. The shaft 262 has a bevel gear 265 secured to its lower end; and this gear meshes with two beveled gears 269 and 270 which loosely embrace a shaft 271. This shaft is constantly driven by any

suitable mechanism, as, for example, a sprocket wheel 279 fixed to it, and a driven sprocket chain 284. These two bevel gears 269 and 270 are provided with clutch jaws facing the clutch jaws on the clutch sleeve 268. This sleeve is splined to the shaft 271 and therefore rotates with it; but it has an annular groove 268^a with which a forked lever 275 engages. This fork lever 275 is pivoted to a fixture, and it carries a roller 275^a which engages with the side faced cam 276 fixed to the recorder shaft 245. This recorder shaft, in a linotype machine in which this invention may be employed will preferably be set in operation at will, as by the depression of the line key, and it will make one complete revolution and then stop; but it is a matter of no consequence to the present invention whether this shaft is driven by hand or by mechanism, or how it is set in operation and stopped when it has completed its revolution. The cam 276 must, however, be so shaped that during one complete revolution of the shaft 245 the fork lever 275 will be rocked so as to carry the clutch sleeve 268 from its neutral position into engagement with the gear 270, and then back to its neutral position, and then in the opposite direction into engagement with the gear 269, and then back to its neutral position. While gear 270 is in engagement with clutch sleeve 268, the shaft 262 turns in that direction which moves the line carrier to the left and carries the line of matrices along the assembling rail to such position that they may be subsequently engaged and controlled by other mechanism. When the shaft 262 is being rotated by the gear 269, said shaft turns in the contrary direction and moves the line carrier to the right, to the position for engagement with a new line. When the shaft 245 stops this sleeve 268 should be in the neutral position.

I will now describe the mechanism through which the line carrier may or may not, according to circumstances, cause the operation of the mechanism through which the cam shaft 4 is connected with the rotating ratchet 45. A lever 60 is fixed to a rock shaft 61 mounted in a part of the framework of the machine. In the upper end of this lever is a spring pawl 62. Fixed to the line carrier slide 246 is a dog 249 having a beveled left end. This dog is so placed, relative to the upper end of the lever 60 and the spring plunger 62 therein, that, when the line carrier moves to the left, the beveled face of the dog 249 will engage with the plunger 62 and will press it down so that the dog 249 may pass over it. If the line carrier moves as far as it should to properly place the matrix line, the dog will pass entirely over the spring plunger, and the latter will fly up behind the dog. If the move-

ment of the line carrier is checked in any manner before it moves as far as it should, said dog will not pass this spring plunger, and therefore, as will be seen, the lever 60 will not be operated when the line carrier moves to the right. Assuming, however, that this dog has passed the spring plunger 62, then when the line carrier moves to the right, the dog, by pressing against this spring plunger will rock lever 60 and swing it until the dog can slide over the spring plunger 62.

Fixed to the rock shaft 61 is a bell crank lever 64. The horizontal arm of this lever lies beneath an arm 65^a on a bell crank lever 65 which is mounted on a fixed screw stud 65^b. The vertical arm of the bell crank lever 64 engages with a stop pin 66 to limit its movement in one direction, namely, the direction in which shaft 61 is turned by the action of spring 66^a. The stop 66 is carried by a fixed portion of the frame of the machine. The vertical depending arm of the bell crank 65 is forked as at 65^c; and the casting controlling fork 67 is pivoted to said depending arm of the bell crank 65, on a pivot which is at right angles to the pivot on which said bell crank turns. The vertically slotted lower end of the fork 67 engages in an annular groove in a pin 35. This pin is horizontally movable in a triangular frame 34, which frame is slotted vertically so as to permit the fork 67 to pass to the position where it may engage said pin. In its normal position this pin is inoperative, but when moved by the line carrier, through the train of mechanism described, this pin is pushed forward and over the end of an arm 36^a of the lever 36 which is loosely hung on the stud 261, as shown in Fig. 4.

The frame 34 is pivoted to one arm of the lever 33, which is loosely hung on the fixed stud 261. This lever carries a roller 33^a which engages a cam 32 fixed to the recorder shaft, and it is held in engagement with said cam by a spring 33^b. The frame 34 also embraces the flat slotted head 72 attached to the endwise movable rejector rod 71; and a pin 34^a carried by this frame 34 goes through the vertical slot 72^a in said head. When this pin 35 has been moved so as to project over the end of arm 36^a, the recorder shaft 245 may be turned. The cam 32 thereon will rock lever 33; said lever will draw the frame 34 down; and the pin 35 by engaging with the arm 36^a, will swing the lever 36 so as to withdraw it from engagement with trip arm 48, as shown in Fig. 3, whereupon the spring 49 will swing pawl 46 into engagement with a ratchet 45, and then the cam shaft 4 will be turned. There is a spring-actuated retaining pawl 68 mounted upon the same pin 34^b which connects frame 34 with lever 33. Normally this is spring

pressed against the lower end of the fork 67, but when said fork has been rocked, as stated, to carry the pin 35 over the arm 36^a, its lower end passes off of this pawl 68, whereupon the latter will fly up behind said fork and hold it for the time being in the position to which it has been removed; but when the lever 33 is rocked by cam 32, the pawl 68 will be drawn down below the lower end of the fork 67, which permits said fork, under the influence of the spring 66^a, to fly back to its normal position. As shown in Fig. 3, a shoulder 68^a on the pawl 68 engaging a part of the lever 33 limits the spring induced movement of said pawl. Figs. 3 and 4 show the position of the pawl 68 relative to the fork 67 when the lever 33 has been rocked by the cam 32 for the purpose of withdrawing the lever 36 from its engagement with the arm 48. When the described parts have performed their function as described, and the lever 33 is allowed to be drawn by its spring 33^b back to its normal position, the spring 66^a will immediately swing the bell crank 65 and with it the fork 67 and pin 35 back to their normal positions, and then as the frame 34 is being lifted, the top of the pawl 68 will engage with the lower end of the fork 67 and be returned to its initial position, as shown in Fig. 1.

It will be understood that if the line carrier does not move as far as it should toward the left, the lever 60 will not be rocked, and therefore none of the parts controlled thereby will be moved. When, therefore, cam 32 rocked lever 33 during the revolution of the recorder shaft 245, it will draw the frame 34 down, but the pin 35, not having been projected out over the arm 36^a, will not move the latter, and therefore the shaft 4 will not be connected with the ratchet 45.

It sometimes happens that the operator may wish to reject a line of matrices—that is to say, may not wish to cast a line of type therefrom. In that event he may press down upon the vertically movable spring actuated key 76. The lower end of this engages the horizontal arm of a bell crank lever 84, the vertical arm of which has a slot and pin engagement with the rejector rod 71. This will cause the movement to the right of this rod, and this will carry the upper end of the frame 34 to the right far enough to carry the pin 35 to the right of the arm 36^a. Now, although the lever 60 is rocked by the line carrier, and the pin 35 is projected, it will not strike arm 36^a when the frame 34 is drawn down; and therefore the lever 36 will not be drawn to the pawl-releasing position. Fig. 5 shows the position of the parts when the operator has by the depressing of the key 76 put them into inoperative position described.

Having described my invention, I claim:

1. The combination of a driving member, a driven member and spring actuated mechanism for connecting them, with a device
5 restraining the operation of said connecting mechanism, a line carrier, a movable member adapted to be engaged thereby only when the line carrier has completed its movement in one direction, and mechanism
10 operated by said member for making or breaking the train of mechanism through which the restraining device is withdrawn.
2. The combination of a line carrier, a lever having a spring plunger in its end,
15 a dog carried by the line carrier and adapted to operatively engage with said spring plunger and to pass it when the line carrier has moved to the end of its path in one direction, a driven shaft, driving mechanism therefor, and mechanism under the
20 control of said lever for connecting and disconnecting the driving member and driven shaft referred to.
3. In a linotype machine, the combination of a line carrier and mechanism for moving it backward and forward in a fixed path, a dog 249 fixed to said line carrier, and lever arm having a spring plunger in its end adapted to be engaged by said dog,
30 a rock shaft to which said arm is connected, an arm fixed to said rock shaft, a bell crank lever having one arm which engages with the last mentioned arm, a restraining lever having a shoulder, a frame having a
35 pin adapted to be projected over said shoulder, a forked member engaging said pin and connected with the other arm of the last mentioned bell crank lever on a pivot at right angles to the axis of said lever, a lever
40 pivotally connected with said frame, and a cam for actuating the latter lever.
4. In a linotype machine, the combination with a line carrier and mechanism for operating the same, of an arm projecting
45 in the path of said line carrier, of a rock shaft to which said arm is secured, a second arm connected with said rock shaft, a bell crank lever, one arm of which engages with the arm last mentioned, a fork member pivoted to the other arm of said bell crank lever, a rotatable driven member, a rotatable
50 driving member, mechanism for automatically connecting these members, a device restraining the action of said connecting mechanism and provided with a shoulder, a pin adapted to be projected over the shoulder on said restraining device and adapted to be moved into and out of that position by said fork member, a frame in which
60 said pin is mounted, a lever pivotally connected with said frame, and a cam for operating said lever.
5. The combination of a driven shaft, a driving member therefor including a

ratchet, a disk fixed to the driven member, 85 a spring actuated dog mounted on the disk and provided with a trip arm, a trip lever adapted to engage said arm to withdraw the pawl from engagement with said ratchet, a rotatable cam, a lever adapted to be operated thereby, a device connected with the last mentioned lever, a movable member carried by said device and adapted to be moved into positions where it may or may not engage the trip lever, a line carrier, and 75 mechanism operated thereby for determining the position of the last mentioned movable member.

6. In a linotype machine, the combination of a driven member, a driving member, 80 mechanism acting automatically to connect said two members, a device restraining the action of said connecting mechanism and provided with a shoulder, a frame, a movable pin therein which may be projected 85 over the shoulder on said restraining device but which normally does not so project, a rocking lever to which said frame is connected, a cam for operating said lever, mechanism for projecting said pin over the 90 shoulder, a line carrier, and operative connections between said line carrier and said mechanism.

7. In a linotype machine, the combination of a line carrier and mechanism for moving 95 it first in one direction and then in the reverse direction, a lever having a spring plunger in its end which projects into the path of a part of said line carrier, a rotatable driving member, a driven member, 100 mechanism for connecting the driving and driven members, and mechanism controlled by said lever for permitting or preventing the operation of said mechanism for connecting the driving and driven members. 105

8. In a linotype machine, the combination of a line carrier movable in a guided path, a belt connected with said line carrier and adapted to operate the same, a driving sheave around which said belt goes, a rotatable shaft connected with said sheave, 110 mechanism for turning said shaft first in one direction and then in the other, a movable device which projects into the path of a part of said line carrier and is adapted 115 to be operated thereby when the line carrier has completed its travel in one direction and has started to move in the reverse direction, and mechanism operated by said device. 120

9. In a linotype machine, the combination of a driven member, a driving member, mechanism acting automatically to connect said two members, a device restraining the action of said connecting mechanism, said 125 device being provided with a shoulder, a movable frame, a movable pin therein which may project over the shoulder on said re-

straining device, but which normally does not so project, a rocking lever to which said frame is connected, a cam for operating said lever, mechanism for projecting said pin
5 over the said shoulder, a line carrier, a rejector device connected with said movable frame, and means adapted to be engaged by said line carrier for moving the rejector

device and thereby moving the frame into an inoperative position.

In testimony whereof, I hereunto affix my signature in the presence of two witnesses.

ARTHUR W. LE BOEUF.

Witnesses:

ARTHUR J. B. HUDSON,
EDWARD F. GODDARD.

10

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."