

May 17, 1938.

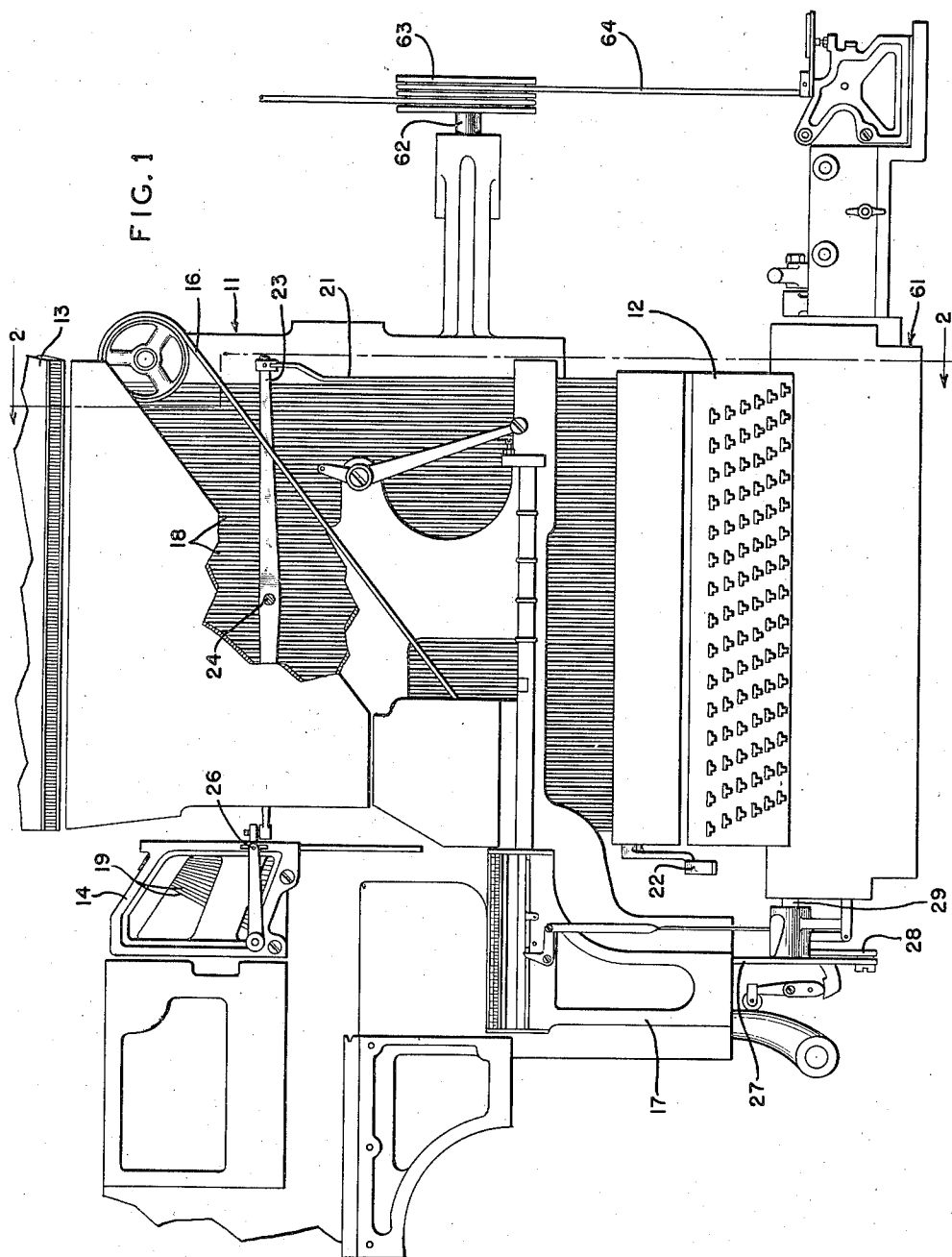
M. T. GOETZ ET AL

2,117,474

CONTROL MECHANISM FOR LINECASTING AND COMPOSING MACHINES

Filed Feb. 27, 1937

3 Sheets-Sheet 1



BY

INVENTOR.
MAURUS T. GOETZ
HAROLD W. HUDSON

H. B. Whitfield
ATTORNEY.

May 17, 1938.

M. T. GOETZ ET AL

2,117,474

CONTROL MECHANISM FOR LINECASTING AND COMPOSING MACHINES

Filed Feb. 27, 1937

3 Sheets-Sheet 2

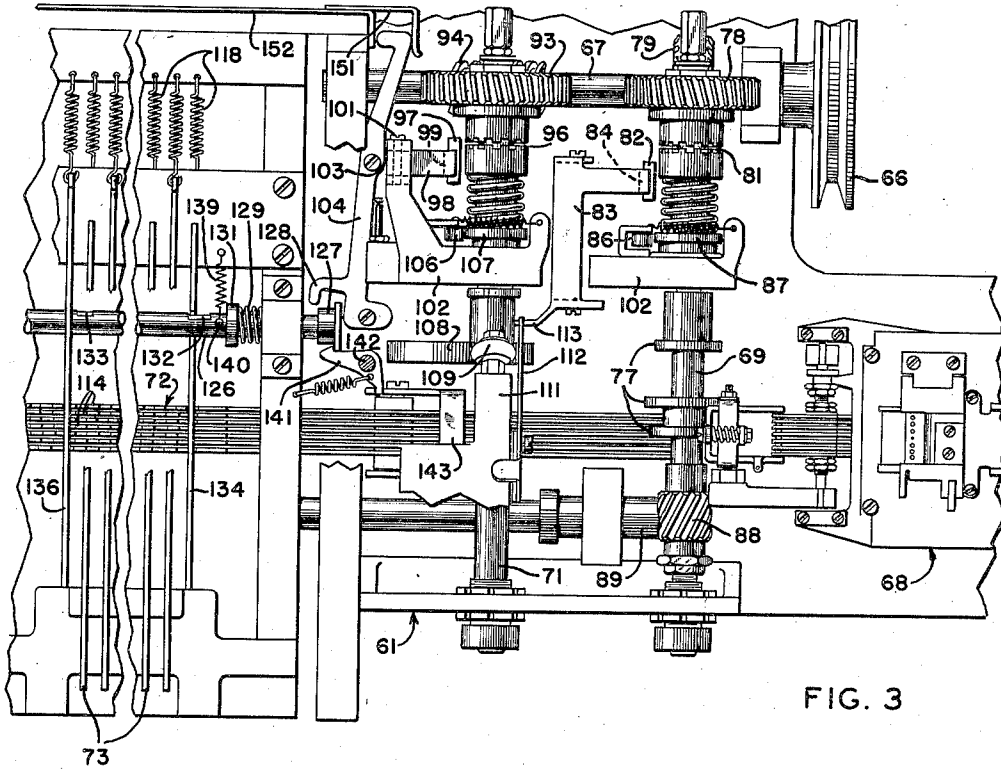


FIG. 3

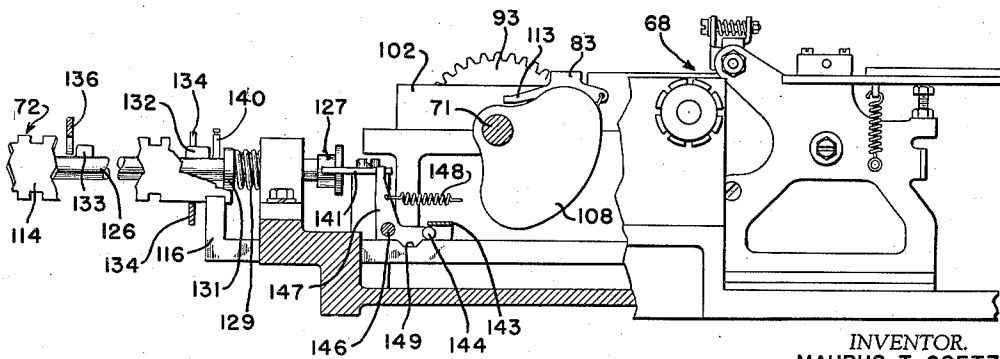


FIG. 4

BY

INVENTOR.
MAURUS T. GOETZ
HAROLD W. HUDSON

H. B. Whitfield
ATTORNEY.

May 17, 1938.

M. T. GOETZ ET AL

2,117,474

CONTROL MECHANISM FOR LINECASTING AND COMPOSING MACHINES

Filed Feb. 27, 1937

3 Sheets-Sheet 3

FIG. 5

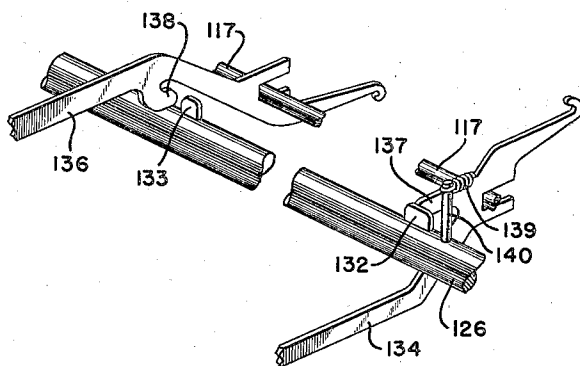
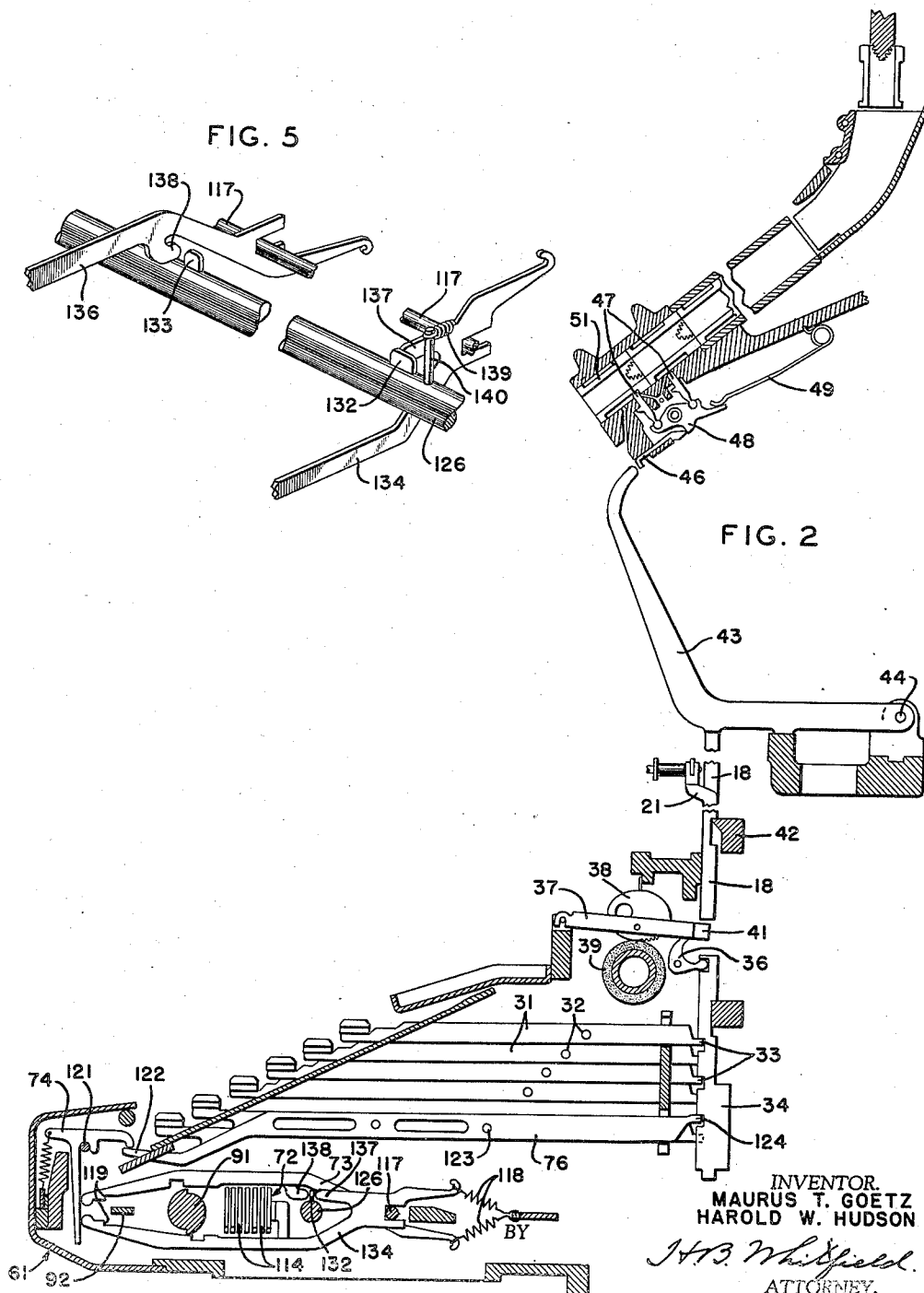


FIG. 2



INVENTOR.
MAURUS T. GOETZ
HAROLD W. HUDSON

H. B. Whitfield.
ATTORNEY.

UNITED STATES PATENT OFFICE

2,117,474

CONTROL MECHANISM FOR LINECASTING
AND COMPOSING MACHINESMaurus T. Goetz and Harold W. Hudson, Chicago,
Ill., assignors, by mesne assignments, to Tele-
typesetter Corporation, a corporation of Dela-
ware

Application February 27, 1937, Serial No. 128,147

19 Claims. (Cl. 199—51)

This invention relates to linecasting and composing machines and particularly to apparatus for effecting the selective response of such machines to stored control conditions.

5 An object of the invention is to actuate concurrently a plurality of ordinarily individually responsive instrumentalities in direct response to a signal assigned to the control of one of the instrumentalities as a result of modification of a
10 previously established signal condition associated with the selection of an operation functionally unrelated to those of the previously mentioned instrumentalities.

In the composition of material to be printed,
15 it is the custom to finish all lines except certain short ones on a fixed right-hand margin. In composing machines of the line-casting species, this operation, called justification, is accomplished through the use of expansible space bands to provide inter-word spaces. As a line is con-
20 cluded, if the expansibility afforded by the included space bands is sufficient to expand the line until it fills the required column width, the line is said to be justifiable. It may sometimes
25 happen that a composed line which is short of justifiable length will not accommodate the next word or the first syllable of that word. The compositor may increase the length of the line by inserting fixed spaces, which are blank matrices of uniform thickness, adjacent the space bands.
30

The subsection of linecasting and composing machines to automatic control, such as for example, in the manner disclosed in Patent No. 2,091,286 granted August 31, 1937 to Howard L. Krum et al., may necessitate special treatment
35 with reference to non-justifiable lines. Automatic control units of the type disclosed in the patent of Howard L. Krum et al. may be controlled by perforated strips which may be produced by means of a keyboard perforator, such
40 as the one disclosed in Patent No. 2,059,250 granted November 3, 1936 to Howard L. Krum. The counting of the matrix thicknesses and minimum and maximum space band values
45 cumulatively is accomplished concurrently with the application of the signals to the strip representing the matrices and space bands to be assembled. The deficiency of a line is discovered after the signals have been applied to the tape,
50 but individual signals for the selection of fixed spaces cannot then be inserted conveniently because the already punched signals follow one another at closely spaced uniform intervals. It has been the practice heretofore to render the
55 series of signals representing a deficient line in-

effective by re-running the signals through the perforator and converting each to the so-called rub-out or all perforated signal. This series of ineffective signals is then followed by a reperfora-
5 tion of the signals representing the line to be composed, with the fixed space signals included at the desired points. The sensing of the idle signals, when the control strip is run through the control unit for the linecasting and compos-
10 ing machine, accomplishes no useful purpose and results in a period of idleness of the composing machine.

In accordance with the present invention, it is proposed to control the release of fixed spaces to accompany a deficient line automatically, with-
15 out the insertion of signals particularly associated with the release of fixed space matrices, and by the modification of a single signal preceding the deficient line. The signal it is proposed to modify is the elevator signal which controls the delivery of the immediately preceding assembled line to the line delivery slide. The modification com-
20 prises the perforation of an additional code hole or holes, whereby the ordinary elevator signal is converted into an extraordinary elevator signal. It may be accomplished by backing the control
25 strip through the perforator until the elevator signal is aligned with the punches, and depressing the keylever assigned to the execution of an extraordinary elevator signal, or by inserting the
30 additional perforation or perforations by means of a hand punch or by an auxiliary punch block in the keyboard perforator a distance from the main punch block approximating the average
35 length of line. No other modification of the signals in the tape is required, and none of the signals in the deficient line is destroyed.

Briefly, the preferred embodiment of the invention contemplates a signal responsive control unit for a linecasting and composing machine,
40 such as the one disclosed in the above mentioned patent of Howard L. Krum et al. which includes a retractable interconnection between the selectable element assigned to control the release of space bands and that assigned to control the
45 release of fixed space matrices, so that when the interconnection is not retracted to its position of disablement, the space band selectable element, upon operation, will impart movement
50 to the fixed space selectable element to effect the release of a fixed space matrix simultaneously with the release of the space band.

The permutation code bars of the control unit are so coded with reference to the selectable element assigned to control the operation of
55

the assembler elevator that that element responds to the extraordinary as well as to the ordinary assembler elevator signal. The linkage actuated by the selectable element for setting in operation the elevator operating mechanism shifts the retractable interconnection to ineffective position, where it is retained by a latch if the signal is an ordinary elevator signal. The latch is disabled by a selectable bail if the signal is the extraordinary elevator signal, and the interconnection member is permitted to move to its effective position, where it interconnects the fixed space selectable member with the space band selectable member. The interconnection member remains in effective position until it is retracted upon the selection of the next assembler elevator operation.

A full and complete understanding of the invention may be gained by reference to the following detailed description, taken in connection with the accompanying drawings in which,

Fig. 1 is a front elevational view of a portion of a linecasting and composing machine having an automatic control unit applied thereto;

Fig. 2 is a vertical sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a plan view of a portion of the automatic control unit embodying the invention;

Fig. 4 is a front elevational view of mechanism shown in Fig. 3; and,

Fig. 5 is a detailed perspective view of the retractable interconnecting member in relation to the selectable elements.

Referring now to the drawings in which identical reference numerals designate corresponding parts throughout the several views and particularly to Fig. 1, reference numeral 11 indicates generally a linecasting and composing machine. The linecasting machine has a conventional keyboard mechanism 12, matrix storage magazine 13, space band storage magazine 14, assembler belt 16, and assembler elevator 17. The release of matrices from the matrix storage magazine 13 is effected by the lifting of release reeds 18, which may, if desired, be controlled from the keyboard 12, and the release of space bands 19 from space band storage magazine 14 may be effected by the lifting of a special release reed 21, which may, if desired, be controlled by a manually operable space band key-lever 22. A lever 23 pivoted intermediate its ends as at 24 has one end connected to the space band release reed 21 and has the other end connected to the space band escapement mechanism 26. The assembler elevator 17 has depending therefrom a link 27 which is articulated at its lower end to a crank arm 28 carried by a rock shaft 29.

Fig. 2 shows the manner in which the release reeds are lifted to effect the release of a matrix or a space band. Referring to that figure, it will be noted that keylevers 31 pivoted as at 32 have tongues 33 disposed in notches of individual weight bars 34, which are arranged to be lifted upon the rocking of a keylever 31 either manually or by automatic means. Each of the weight bars 34 is provided near its upper end with a notch in which is disposed one arm of a trigger bell crank 36, the other end of which normally supports a cam yoke 37 in such position that a keyboard cam 38 rotatably mounted in the cam yoke 37 is held out of engagement with a continuously rotating rubber roll 39. Each of the cam yokes 37 has a portion 41 disposed below a corresponding release reed 18 or 21. The re-

lease reeds 18 and 21 are notched to provide a shoulder which rests upon a supporting bar 42, and the notch permits lifting of the release reeds.

The lifting of a weight bar 34 by operation of a keylever 31 causes the rocking of the associated trigger bell crank 36 which frees the associated cam yoke 37 and permits it to drop until cam 38 engages rubber roll 39. Rotation is imparted to cam 38 by rubber roll 39 which causes cam yoke 37 to be rocked counterclockwise (as viewed in Fig. 2) to lift the associated release reed 18 or 21. The lifting of cam yoke 37 by cam 38 returns it to the normal position where it is supported by trigger bell crank 36 in readiness for the next operation of the associated key-lever 31 and weight bar 34.

Above each of the release reeds 18 there is a lever arm 43 pivoted as at 44 and having its free end adjacent to and in operative alignment with a plunger pin 46 of the matrix storage magazine escapements. The lifting of one of the release reeds 18 causes its associated lever arm 43 to be rocked in clockwise direction (as viewed in Fig. 2) about its pivotal mounting 44 to cause escapement plunger 46 to be reciprocated.

The matrix release or escapement mechanism comprises, in the embodiment shown in the drawings, a pair of escapement pins 47 which may enter a matrix storage channel of the magazine alternately under the control of a rocker member 48 to which the pins are articulated. A spring 49 biases each rocker member 48 in clockwise direction (as viewed in Fig. 2) to present the foremost of escapement pins 47 in blocking engagement with the foremost of the matrices 51 in the matrix storage channel. Each of the plunger pins 46 engages an abutment of the associated rocker member 48 so that when the plunger pin is reciprocated, the rocker member is rocked counterclockwise to withdraw the foremost escapement pin 47 to permit the foremost matrix 51 to escape while at the same time presenting the rearmost escapement pin 47 in the path of the immediately following matrix to prevent that matrix from escaping with the foremost matrix. The restoration of rocker member 48 to normal position permits the matrix thus blocked to move down to a position in which it is retained by the foremost escapement pin 47, so that it may escape from the magazine upon the next actuation of rocker member 48.

The present invention contemplates the operation of the keyboard mechanism 12 (Fig. 1) and of other instrumentalities of the linecasting machine, of which assembler elevator 17, operable from rock shaft 29, is an example, under the control of an automatic control unit which is indicated generally by the reference numeral 61, and which may be constructed in accordance with the teachings of the hereinbefore mentioned patent of Howard L. Krum et al. The automatic control unit 61 is attached to the linecasting machine 11 below and forward of the keyboard mechanism 12 and is arranged to be driven by power derived from any convenient continuously rotatable power shaft of the linecasting machine such as the intermediate shaft 52 (Fig. 1). The power take-off for driving the automatic control unit may be a pulley 63 mounted on the intermediate shaft 52. Pulley 63 drives a belt 64 which engages a pulley 66 (Fig. 3) keyed to a shaft 67 rotatably supported in the frame of control unit 61.

Referring to Fig. 3, the principal elements of the automatic control unit 61 are a record reader mechanism indicated generally by the reference

numeral 68, an operating shaft therefor 69, an assembler elevator operating shaft 71, a set of permutation code selector members indicated generally by the reference numeral 72, a plurality of selectable elements or pull bars 73, a set of key-lever operating bell cranks 74 (Fig. 2), and a set of auxiliary keylevers 76. The record reader mechanism 68 is adapted to sense perforations in a control strip and comprises a set of tape sensing levers, a set of transfer levers for communicating the conditions sensed by the tape sensing levers to the set of permutation members 72, and a tape feeding mechanism for intermittently advancing the tape, these elements and mechanisms not being disclosed in detail in the accompanying drawings for the reason that the record reader mechanism is fully described and illustrated in the patent of Howard L. Krum et al. to which reference may be had for a complete understanding of that mechanism. Cams 77 carried by record reader shaft 69 are provided for actuating the tape feeding, tape sensing, and transfer mechanisms of the record reader 68.

Record reader shaft 69 has sleeved thereon a gear 78 which meshes with a pinion 79 keyed to power shaft 67. A spring loaded jaw clutch 81 is provided for interconnecting shaft 69 with gear 78 to cause shaft 69 to be driven, and a clutch throwout lever 82 is associated with the driven portion of clutch 81 for effecting disengagement of that clutch. A retaining lever 83, having a shoulder 84, is provided for holding clutch throwout lever 82 in clutch disengaging position under circumstances which will be set forth hereinafter. A spring biased detent lever 86 engages a cam 87 carried by shaft 69 to prevent chattering of the teeth of clutch 81 when that clutch is disengaged, by insuring rotation of shaft 69 to such position that the teeth are fully disengaged and separated. Shaft 69 also carries a pinion 88 which drives a gear (not shown) carried by a shaft 89. This shaft is provided with cam means 91 (Fig. 2) extending across the entire set of pull bars 73 for stripping them from engagement with the set of code bars 72 when a new combination is to be set up, and with means (not shown) for periodically actuating a universal bail 92 (Fig. 2).

Shaft 71 (Fig. 3) has sleeved thereon a gear 93 which is driven by a pinion 94 keyed to power shaft 67. A jaw clutch 96 similar to jaw clutch 81 is provided for interconnecting shaft 71 with gear 93, and a clutch throwout lever 97 is provided for disengaging clutch 96. A lever 98, having a shoulder 99 for holding clutch throwout lever 97 in clutch disengaging position, is pivotally mounted by means of pivot screw 101 to one of the frame members 102 of the automatic control unit. Lever 98 has a depending arm (not shown) adjacent the point of mounting of pivot screw 101 to be engaged by an abutment portion 103 of a lever 104, the operation of which will be described later, for lifting shoulder 99 out of blocking relation with the clutch throwout lever 97. Spring biased detent lever 106 engages cam 107 keyed to shaft 71 and operates in a manner similar to detent lever 86 to prevent chattering of the toothed portions of clutch 96 when disengaged.

Shaft 71 has keyed thereto a cam 108 upon the periphery of which rides a follower roll 109 carried by a lever arm 111, which, although shown broken away in Fig. 3, is secured to rock shaft 29 (Fig. 1), which operates to lift assembler elevator 17. Cam 108 imparts to rock shaft 29, through lever arm 111, the rocking motion required to raise and lower assembler elevator 17.

A finger 112 associated with lever arm 111 is arranged to depress an extended arm 113 of record reader clutch controlling lever 83 to lift the shoulder 84 thereof from blocking engagement with clutch throwout lever 82 when cam 108 is in its idle position, so that upon completion of an assembler elevator lifting operation, the record reader shaft 69, which is disabled upon the selection of an assembler elevator operation, as fully set forth in the patent of Howard L. Krum et al., shall be restarted. It will be understood that the ratios of gears 78 and 93 to their driving pinions may be such as to impart those rotational velocities to shafts 69 and 71 which are consistent with operating requirements, and with marginal conditions in the linecasting and composing machine 11.

Selecting unit 72 (Figs. 2, 3, and 4) comprises code bars 114 to which permutational settings, in accordance with signal conditions sensed by the record reader, are transmitted. Permutation code bars 114 are flat bars placed side by side and mounted for individual endwise movement between two selective positions. Auxiliary code bar portions or connecting bars 116 engage each of the code bars 114 and extend into the record reader unit 68 where they are articulated to the transfer levers (not shown). Code bars 114 are permutationally notched along the upper and lower edges, so that for each permutational setting of the code bars there may be established an alignment of notches extending across the entire permutation unit 72 which alignment may be in the upper or lower edges of the code bars 114. Selectable bars 73 extend transversely of code bars 114 and are alternately disposed above and below the code bars. As shown in Fig. 2, each of the selectable bars 73 is fitted to a supporting bar 117 by means of notches, and springs 118 urge the selectable bars 73 rightwardly (as viewed in Fig. 2) to seat the selectable bars upon rod 117. Springs 119 also bias those selectable bars which extend below code bars 114 clockwise and those which extend above the code bars counterclockwise, whereby the selectable bars are urged to rotate into engagement with the code bars, and when permitted to rotate by the stripper or spreader cam 91, they move into engagement with the code bars and that selectable bar 73 which finds an alignment of notches rotates farther than do the other selectable bars and enters the alignment of notches.

Each of the selectable bars 73 is provided on the edge, which is adjacent to the code bars 114 and near its forward end (left end as viewed in Fig. 2), with a shoulder 119 which is presented in the path of universal bail 92 upon selection of the selectable bar 73 by entrance of that bar into an alignment of notches. Universal bail 92 is shown in its normal or unoperated position in Fig. 2, and when it is actuated by shaft 89 which carries spreader cam 91, it is moved leftwardly (as seen in Fig. 2) and engages the shoulder 119 of any bar 73 which has been selected and imparts endwise movement leftwardly to that bar.

As previously stated, each of the selectable bars 73 which is assigned to the release of a matrix or a space band has in alignment with it one arm of a bell crank lever 74 which is pivoted on mounting shaft 121. The other arm of each of the bell cranks 74 is disposed above and substantially in engagement with a forwardly extending portion 122 of an auxiliary keylever 76. The auxiliary keylevers 76 are pivoted as at 123 and each has a tongue 124 which is disposed in a notch in one

of the weight bars 34. It will be apparent from this that any one of the weight bars 34 may be lifted to trip the associated cam yoke 37 by depressing the forward end of the associated key-lever 31 or by depressing the foremost portion 22 of the associated auxiliary keylever 76. It will also be apparent that leftward movement of a selected one of the pull bars 73 by universal bail 92 will cause clockwise rocking of the associated bell crank 74 which will depress the forward end of its associated auxiliary keylever 123 to lift the corresponding weight bar 34. The patent of Howard L. Krum et al. hereinbefore identified may be consulted for a fully detailed description and showing of the apparatus thus far described.

As set forth in the beginning of this description, the primary purpose of the invention is to effect the simultaneous release of a fixed space matrix and a space band in response to a space band signal when the compositional conditions require the extra spacing. In accordance with the preferred embodiment of the invention, a rock shaft 126 is supported for endwise as well as rocking movement in the frame of the automatic control unit 61 (see Fig. 3). At its right-hand end (as viewed in Fig. 3), slidable rock shaft 126 is provided with a flanged bushing 127, the flange of which is disposed in the space between the forward end of assembler elevator clutch tripping lever 104 and a hook shaped projection 128 carried by that lever adjacent the forward end thereof. A compression spring 129 surrounds slidable rock shaft 126 and is confined between one of the supporting members of the shaft and a collar 131 fixed to the shaft. Spring 129 provides a force which urges shaft 126 to slide endwise to the left and flanged bushing 127 establishes a limit for leftward movement of the shaft.

Endwise movable rock shaft 126 is provided with upstanding lugs 132 and 133 the former of which intersects the vertical plane defined by space band selectable bar 134 regardless of whether shaft 126 is in its extreme left-hand or right-hand position, the latter of which intersects the vertical plane defined by fixed space selectable bar 136 only when slidable shaft 126 is in its extreme left-hand position. Space band selectable bar 134 differs from selectable bars 73 in that it is provided with a forwardly extending tongue 137 which terminates substantially in engagement with the upstanding lug 132 on the rear face thereof. Fixed space selectable bar 136 differs from selectable pull bars 73 in that it is provided with a rearwardly extending tongue 138, the free end of which is arranged to be engaged by the front face of upstanding lug 133 when shaft 126 is shifted to its left-hand position (Figs. 3 and 5). A tension spring 139 engages a spring pin 140 carried by shaft 126 and applies to the shaft a rotational bias to keep lug 132 in engagement with tongue 137 of selectable bar 134.

It will be apparent from the foregoing description that when space band selectable bar 134 enters an alignment of notches in the code bar 114 so that it may be shifted forwardly by universal bail 92 to effect the release of a space band, it will rock the shaft 126 counterclockwise (as viewed in Figs. 2 and 5) and if shaft 126 is then disposed in extreme left-hand position, upstanding lug 133 will engage tongue 138 of fixed space selectable bar 136 and will shift that selectable bar forwardly to rock its associated bell crank lever 74 and accomplish the tripping of the cam yoke 37 which is assigned to the release of a fixed

space matrix concurrently with the tripping of the cam yoke which controls the release of a space band. In this way, fixed space selectable bar 136 may be operated by bail 92 indirectly from space band selectable bar 134 through the intermediate agency of rock shaft 126 as effectively as if an alignment of notches had been presented to fixed space selectable bar 136 to permit it to be actuated directly by universal bail 92.

As shown in Figs. 3 and 4, a spring biased latch 141 pivotally mounted as at 142 is provided for engaging the flange of bushing 127 to hold slidable shaft 126 in its right-hand position so that upstanding lug 133 is not in registry with tongue 138 of fixed space selectable bar 136. A bail 143, which has a rod 144 extending transversely of the code bar auxiliary bars 116 adjacent the upper edges thereof, is pivoted at 146 and is provided with a vertical arm 147 which engages latch 141 and rocks the latch counterclockwise (as viewed in Fig. 3) to permit the flange of bushing 127 to escape therefrom when bail 143 is permitted to rock clockwise (as viewed in Fig. 4) under the urging of a biasing tension spring 148. The auxiliary connecting bars 116 for the code bars 114 are individually notched as at 149 and for a particular permutational setting of the code bars 114 under the control of the record reader mechanism 68, the notches 149 become aligned below rod 144 carried by bail 143 and permit the bail to rock in response to spring 148 whereby latch 122 is disabled as a restraint upon slidable shaft 126.

Lever 104, in addition to tripping assembler elevator clutch throwout lever 97 through lever 98, also is effective to restore slidable shaft 126 to its right-hand position where it may be held by latch 141. Lever 104 is dually controlled by the selectable bar 73, which is assigned to the control of assembler elevator shaft clutch 96, and by a forked member 151 carried by a rod 152 controlled by the line delivery carriage of the linecasting and composing machine 11. The effect of forked member 151 upon clutch tripping lever 104 is fully disclosed and described in Patent No. 2,006,860 granted July 2, 1935 to M. T. Goetz et al. by reference to which it may be learned that rod 152 moves endwise a short distance in accordance with the operation of the line delivery carriage of the composing machine, the rod being presented in its extreme right-hand position when the line delivery carriage is in position to receive an assembled line of matrices from the assembler elevator, and is in its extreme left-hand position when the line delivery carriage is in transit. Forked member 151 thus serves as a shiftable pivot for lever 104. The operation of lever 104 under the control of the selectable bar 73, which is assigned to an assembler elevator lifting operation, comprises movement of the forward end of lever 104 rightwardly, as is also disclosed in Patent No. 2,006,860. When forked member 151 is in its extreme right-hand position, the rightward movement of the forward end of lever 104 is effective to rock lever 98 by means of abutment 103 to free clutch throwout lever 97 from shoulder 99 and permit the toothed elements of clutch 98 to become interengaged. However, when forked member 151 is in its extreme left-hand position, rightward movement of the forward end of lever 104 does not shift its abutment a sufficient distance to the right to trip lever 98. Irrespective of the position of forked member 151, the rightward movement of the forward end of lever 104 is sufficient to cause hooked

member 128 to engage the flange of bushing 127 and to shift the flange to the right of the latching shoulder of latch 141.

The automatic control unit herein disclosed is adapted to be controlled by a perforated record strip in which the perforations are uniformly spaced along the strip with no extra spacing occurring between signals representing the end of one line of composition and the beginning of the next. An assembler elevator signal is the final signal in any group of signals representing a line of composition, and causes the assembler elevator to transfer the assembled line of matrices and space bands to the line delivery carriage. Since it is expedient to minimize the use of signal combinations in the record strip, the sole function of which is to accomplish a conditioning operation in the automatic control unit which has no immediately corresponding function in the composing machine, in order to obtain maximum efficiency from that machine, it is desirable not to employ a special signal combination assigned to the sole function of conditioning the control unit for operation of the fixed space pull bar by the space band pull bar. In control strips, as employed for operating the control unit, there is no space, between the assembler elevator signal for a given line and the character code signal at the beginning of the next line of composition, into which a fixed space adding signal could be inserted. The need for such signal does not become apparent to the operator of the control strip preparing machine, which may be of the type disclosed in Patent No. 2,059,250 granted November 3, 1936 to H. L. Krum, until signals representing substantially an entire line of matrices have been impressed upon the control strip. It, therefore, is not feasible to predetermine the need of a fixed space adding signal and apply it to the control strip ahead of the first character code signal of a line of composition.

In the preferred embodiment of the invention, it has been found convenient to render the assembler elevator selectable bar responsive to either of two permutation code signals one of which may be a primary or ordinary elevator signal, the other of which may be a secondary or extraordinary elevator signal. The secondary elevator signal may, if desired, comprise one or more perforations in addition to perforations of the number and in the positions assigned as the primary elevator signal. The manner in which the code bars of a permutation code unit may be notched to render a single selectable member responsive to two different code signal combinations is fully described in Patent No. 2,098,973 granted November 16, 1937 to A. H. Reiber.

The notches 149 in the code bar links 116 are related to the notching of the code bars so that notches 149 are aligned below bail rod 144 when the code bars have been set in accordance with the extraordinary assembler elevator signal, but no such alignment of the notches 149 is presented to rod 144 when the code bars are set in accordance with the primary assembler elevator signal.

In order that the operation of latch 141 and lever 104 to control rod 126 under both conditions of selection of assembler elevator operation may be understood, let it be assumed first that code bars 114 are set in accordance with the normal or primary elevator signal. Bail rod 144 remains unselected and latch 141 is held in blocking relation to the flange of flanged bushing 127. The forward end of lever 104 is moved rightwardly due to operation of its associated selectable bar

73 by universal bail 92, and during this movement hook portion 128 of lever 104 engages the flange of bushing 127 and shifts rock shaft 126 rightwardly irrespective of whether that shaft had been in its extreme leftward position or latched by latch 141 until the flange is carried to the right of the locking shoulder of latch 141. As the forward end of lever 104 returns to its normal or leftward extreme position, shaft 126 is unable to follow it to the left beyond the point of engagement of the flange with the latching shoulder of latch 141. Upstanding lug 133 of shaft 126 is thus held out of registry with tongue 138 of fixed space selectable bar 136, and upon each actuation of selectable bar 134 a space band only is released.

Assume now that the code bars 114 are positioned in accordance with the secondary or extraordinary elevator signal. Notches 149 in code bar links 116 are aligned beneath bail rod 144, and as the rod enters the alignment of notches, bail 143 is rocked clockwise by spring 148. The rocking of bail 143 withdraws the latch 141 from engagement with the flange of bushing 127, and the latch is held out of the path of that flange as long as the code bars remain set in accordance with the extraordinary elevator signal, which is preferably long enough for the foremost end of lever 104 to be presented in its extreme right-hand position and return to its normal position. This permits shaft 126 to move endwise to the left a distance which carries the flange of bushing 127 to the left of the locking shoulder of latch 141 so that when the code bar setting is changed and bail 143 returns to unselected position to present latch 141 in latching position, the flange of bushing 127 has escaped from the latch so that shaft 126 remains in its extreme leftward position to present its upstanding lug 133 in registry with tongue 138 of fixed space selectable bar 136 until it shall be shifted rightwardly in response to the next assembler elevator signal.

It will thus be observed that endwise movable rock shaft 126 is shifted to its idle or ineffective position in response to the sensing of every assembler elevator signal whether ordinary or extraordinary. The difference between the two elevator signals is interpreted by bail 143, which controls latch 141 to retain shaft 126 in idle position or to permit it to move to its effective position as the case may be.

It should be noted that the interconnection between space band selectable bar 134 and fixed space selectable bar 136 is not reversible in operation. Selectable bar 136 is free to respond to a fixed space signal established in the code bars and to be actuated by universal bail 92 to effect the release of a fixed space from the matrix storage magazine 13 without imparting rotation to shaft 126 or without disturbing the effective control of selectable bar 134 upon selectable bar 136 to rock shaft 126.

The provision of extraordinary elevator signals in the control strip is a matter of operating technique with reference to a strip perforating mechanism such as the one disclosed in Patent No. 2,059,250. As previously stated, the operator of the perforating mechanism does not discover that extra spacing will be required until signals representing a nearly completed line have been impressed upon the control strip. An elevator signal for the preceding line of composition has already been applied to the tape, and that signal is a normal or ordinary elevator sig-

nal. In order that the needed extra spacing may be provided for the line, the composition of which is about to be completed, the elevator signal for the preceding line may be converted from the ordinary to the extraordinary elevator signal. This conversion may be effected by adding to the control strip, in the area assigned to the already perforated ordinary elevator signal, the additional perforation or perforations by which the extraordinary elevator signal differs from the ordinary elevator signal. It is understood, as previously stated, that the extraordinary elevator signal will be identical with the ordinary signal except that it will have one or more additional perforations. The addition of these perforations may be accomplished in several ways. For example, the tape may be backed through the punch block of the perforating mechanism shown in the patent, until the normal elevator signal preceding the unfinished line of composition is in registry with the punches, whereupon the key-lever assigned to the perforation of the extraordinary elevator signal may be depressed to effect conversion of the elevator signal by the addition of one or more perforations. The conversion perforations may also be added to the tape by a hand punch, if it is not desired to employ the perforator of the strip preparing mechanism, or to provide a keylever for the extraordinary elevator signal.

Although a particular embodiment of the invention has been shown and described herein, it is to be understood that the invention is not limited to such embodiment, but is capable of modification, rearrangement, omission, and substitution of parts without departing from the spirit of the invention within the scope of the appended claims.

What is claimed is:

1. In a selector mechanism, a plurality of ordinarily individually responsive instrumentalities, a pair of concurrently responsive instrumentalities, and means controlled by one of the last mentioned instrumentalities for causing one of said ordinarily individually responsive instrumentalities to respond concurrently with said pair of instrumentalities.

2. In a selector mechanism, a signal sensing mechanism, a plurality of instrumentalities ordinarily individually responsive to sensed signals, means for interconnecting certain of said instrumentalities for concurrent operation responsive to the signal assigned to one of them, and signal responsive means functionally unrelated to said certain instrumentalities for conditioning the interconnecting means.

3. In a signal responsive selector mechanism, a plurality of selectable elements responsive individually to single signals, a selectable element responsive to a predetermined signal, and means controlled by the last mentioned element for conditioning certain of the first mentioned selectable elements to operate concurrently in response to a single signal.

4. In a permutation code selector mechanism, a plurality of selectable elements responsive individually to single permutation code combinations, a selectable element responsive to a particular permutation code combination, and means controlled by the last mentioned element for establishing an operative interconnection between certain of the first mentioned selectable elements.

5. In a permutation code selector mechanism, a plurality of selectable elements responsive individually to single permutation code combina-

tions, a selectable element responsive to a particular permutation code combination, and means controlled by the last mentioned element establishing an interconnection operable unidirectionally between one of the first mentioned selectable elements and another.

6. In a linecasting and composing machine including matrix releasing, space band releasing, and line transferring mechanisms, signal responsive means for selectively controlling said mechanisms, and means responsive to a line transferring control signal for interconnecting said space band releasing mechanism and certain of said matrix releasing mechanisms.

7. In a linecasting and composing machine including matrix releasing, space band releasing, and line transferring mechanisms, signal responsive means for individually controlling said matrix releasing mechanisms, signal responsive means for controlling said space band releasing mechanism, means responsive to a plurality of signals for controlling one of said line transferring mechanisms, and means responsive to one of said transferring mechanism control signals for interconnecting with said space band releasing control means one of said matrix releasing control means.

8. In a linecasting and composing machine including fixed space matrix releasing, space band releasing, and line transferring mechanisms, signal responsive means for individually controlling said fixed space matrix releasing and space band releasing mechanisms, means responsive to a plurality of signals for controlling one of said line transferring mechanisms, and means responsive to one of said line transferring mechanism control signals for imparting to said space band releasing control means operative control over said fixed space matrix releasing control means.

9. In a linecasting and composing machine including fixed space matrix releasing, space band releasing, and line transferring mechanisms, signal responsive means for individually controlling said fixed space matrix releasing and space band releasing mechanisms, means responsive to a plurality of signals for controlling one of said line transferring mechanisms, and means cooperative with the last mentioned means and responsive to one of said line transferring mechanism control signals for subjecting said fixed space matrix releasing control means to operation by said space band releasing control means.

10. Signal responsive mechanism for controlling linecasting and composing machines, including a plurality of selectable elements, signal controlled means for controlling the selection of said elements, a rock shaft extending transversely of said selectable elements, and means carried by said shaft in abutment with a portion of a selectable element for rocking said shaft in response to selective operation of said element.

11. Signal responsive mechanism for controlling linecasting and composing machines, including a plurality of selectable elements, a rock shaft extending transversely of said selectable elements, means carried by said shaft in abutment with a portion of one of said selectable elements for rocking said shaft in response to selective operation of said element, and further means carried by said shaft in substantial abutment with a portion of another selectable element for effecting quasi selective operation thereof.

12. Signal responsive mechanism for controlling linecasting and composing machines, including a plurality of selectable elements, an endwise

movable rock shaft extending transversely of said selectable elements, means carried by said shaft for imparting rocking motion thereto under control of one of said selectable elements, further means carried by said shaft for imparting movement to another of said selectable elements depending upon the endwise presentation of said shaft, and means for moving said shaft endwise to present said further means in movement imparting relation to said other selectable element.

13. Signal responsive mechanism for controlling linecasting and composing machines, including a plurality of selectable elements, an endwise movable rock shaft extending transversely of said selectable elements, means carried by said shaft for invariably receiving movement from one of said selectable elements, further means carried by said shaft for selectively imparting movement to another of said selectable elements depending upon the endwise presentation of said shaft, means tending to move said shaft endwise to present said further means in movement imparting relation to said other selectable element, means for restraining said shaft from endwise movement to said movement imparting position, and selectively operable means for disabling the restraining means.

14. A linecasting and composing machine including a magazine having fixed space matrices and space bands, a selector mechanism responsive to control indicia appearing in a control strip, elements controlled by said mechanism for controlling the release of fixed space matrices and space bands, a device selected and operated by said selector mechanism for each line of composition, and means controlled in response to said indicia in said strip which also selects and determines the operation of said device for causing the operation of said element for the fixed space matrix simultaneously with the operation of the element for said space bands.

15. A device for the automatic control and operation of linecasting and composing machines including a selector mechanism responsive to control indicia in a control strip, a plurality of elements selectable by said mechanism, means

operated by said mechanism in response to a particular indicia for effecting the dual selection of certain of said elements, and means whereby one of said dually selected elements is operated subsequently to the operation of said other dually selected element.

16. In a signal responsive selector mechanism, a plurality of selectable elements responsive to individual signals, a selectable element responsive to a particular signal, and means controlled by said last mentioned element for establishing a condition whereby certain of said first mentioned selectable elements operate concurrently in response to a single signal.

17. In a signal responsive selector mechanism, a plurality of selector elements responsive to individual signals, certain of said elements arranged to operate concurrently, instrumentalities responsive to a particular signal identified with two operations for establishing a condition for such concurrent operation, and means thereafter effective for causing said concurrent response.

18. In a signal responsive selector mechanism, a plurality of selector elements responsive to individual signals, certain of said elements arranged to operate concurrently, instrumentalities responsive to a signal identified with a previous group of signals for establishing a condition for such concurrent operation, and means effective in response to a signal accompanying another group of signals for causing said concurrent response.

19. In a signal responsive selector mechanism, a plurality of selector elements responsive to individual signals, certain of said elements arranged to operate concurrently, instrumentalities responsive to a signal identified with a previous group of signals for establishing a condition for such concurrent operation, and means effective in response to each signal of similar identity accompanying a subsequent group of signals for the composition of a line of matrices for causing such concurrent operation.

MAURUS T. GOETZ.
HAROLD W. HUDSON.