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TAPE CONTROLLED APPARATUS

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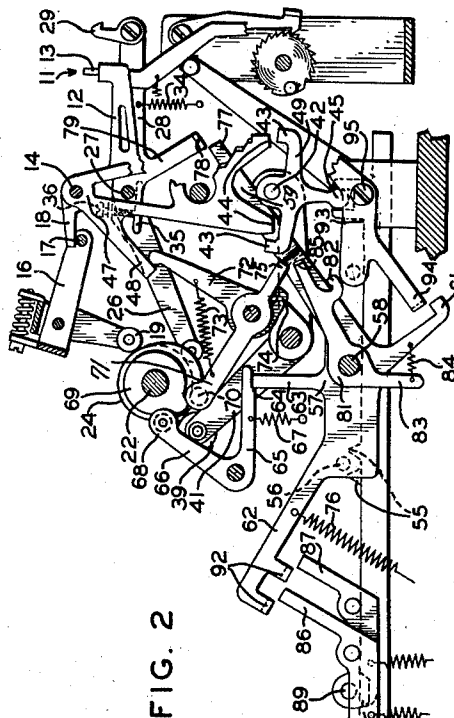
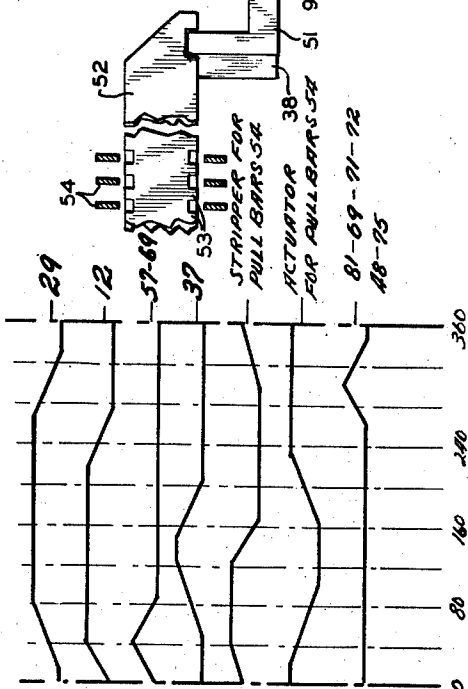


FIG. 2

FIG. 3.



STRIPPER FOR
PULL BARS 54
ACTUATOR 38
FOR PULL BARS 54
81-89-91-92
48-95

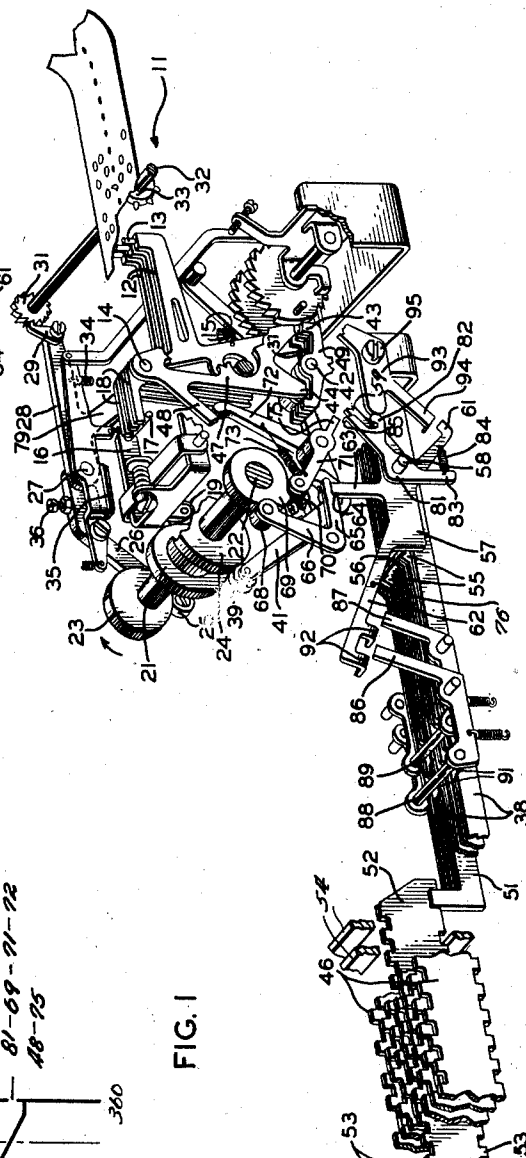


FIG. 1

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TAPE CONTROLLED APPARATUS

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31 Claims. (Cl. 199—18)

The present invention relates to linecasting and composing machines and more particularly to signal controlled mechanism employed for the automatic operation and supervision thereof.

In the attainment of automatic control of present commercial types of linecasting and composing machines it has been observed that the speed of operation which is attainable by the signal sensing and mechanical selecting mechanism exceeds that at which the linecasting machine is capable of responding. Accordingly, devices have been perfected which serve to introduce a time lag or delay factor into the operation of the automatic control mechanism so that there may result a reconciliation in certain instances where the speeds of the two devices are at variance. U. S. Patents No. 2,062,332 and No. 2,090,654 disclose examples of mechanisms designed to obtain a coordination between automatic control devices and the principal linecasting and composing machines.

Where in ordinary composition, various character matrices are released alternatively and in irregular succession, a given matrix release device has sufficient time to restore itself to normal condition whence it may be in readiness for a succeeding operation, though in so doing it requires a somewhat longer period to complete its function cycle than that period which is required by an operating unit to complete its initiating cycle. In the case of duplicate release operations of similar characters, it has been found that a sufficient overlap exists in the release stroke of the second signal to extend into the time interval occupied by the second release operation, so that in the case of two duplicate character release operations the response of the linecasting or principal machine may be adequately regulated by existing automatic control devices. Where, however, a given signal is repeated more than once, it has been observed that the occurrence of the third initiating stroke is so far in advance of the third consecutive operating cycle of the principal machine that its associated matrix release device is incapable of arriving at its normal position in sufficient time to respond thereto.

Accordingly an object of the present invention is the provision of apparatus responsive to characters repeated consecutively for introducing a delay factor in the operation of the control unit and thereby reconciling the inherent speed thereof with that of its associated linecasting machine.

For the achievement of the foregoing purpose there is contemplated in accordance with the present invention, a record reader mechanism including a set of tape sensing feeler levers and having associated with it a selectable device conditioned by consecutive ones of a series of similar character signals and effective to arrest momentarily the continued operation of the record

reader mechanism. As a result of such selection, there is permitted the intervention of a time delay factor which not only blocks the selection and actuation of the particular selectable element whose code signal has become manifest but also arrests the reciprocatory tape feeding apparatus resulting in the retention of the tape in effective position to be sensed, so that upon subsequent operation the ensuing code signal may be translated immediately to the selector mechanism.

After an abeyance which is equivalent to one cycle of operation of the record reader mechanism, the repeat signal selection device is restored to normalcy to await the occurrence of another plurality of similar code signals appearing in consecutive succession.

For a more comprehensive understanding of the present invention, reference may be had to the accompanying drawing and to the specification following hereinafter in which similar reference characters are used to indicate corresponding parts throughout, and in which

Fig. 1 is a diagrammatic perspective view of a record reader mechanism having embodied therein principles representative of the present invention,

Fig. 2 is a longitudinal sectional view through a mechanism similar to that illustrated in Fig. 1, and

Fig. 3 is a timing chart featuring the periods and duration of certain functions in connection with the present invention in terms of their principal operating elements. This chart includes a number of curves, the tops of which represent operated or effective conditions as produced by the cams on shaft 22, and the bottoms of which represent the opposite conditions.

In its preferred embodiment, the present invention has been adapted to an automatic control mechanism resembling in general appearance the one shown in U. S. Patent No. 2,091,286. A record reader mechanism is indicated by the reference character 11, which consists briefly of a set of feeler levers or tape sensors 12, each provided with a feeler pin 13 and pivoted on a common shaft 14. The perforated tape or control form is previously prepared in a perforating machine where it receives permutatively variant transverse rows of holes. Each row relates to a line composition character or to a collateral composition function, where the tape is employed in the control of linecasting machines, and may be said to comprise the area, transversely, in which a basic number of perforations may occur permutably. Because the presence or absence of a perforation is controlled by perforating mechanism which may be electrically supervised, these indications will be referred to according to telegraph terminology as marking and spacing signal elements respectively. For convenience in describ-

ing the sensing and transfer mechanism of the record reader mechanism in its alternative positions corresponding terminology will be employed hereinafter.

- 5 Individual springs 15, Fig. 1, tend normally to maintain the feeler levers 12 in their extreme counterclockwise position and in this they are cyclically opposed by the action of a reciprocating ball 16 which is comprised of a transversely extending rod 17 traversing beneath the horizontal extensions 18 integrally formed with the feeler levers 12. The curve 12 on Fig. 3 indicates the normal cycle of operation of the feeler levers 12. The reciprocating ball 16 is pivotally supported at an intermediate point thereof and includes a depending portion which carries a follower roller 19 spring urged against the periphery of a feeler lever operating cam 21. The latter is carried upon a shaft 22 which is driven through a clutch from a suitable source of power. In addition to cam 21, shaft 22 also carries a tape feed cam 23 and cam 24 which serves to reciprocate periodically a set of transfer levers to be described later.

- During its cycle of rotation, tape feed cam 23 imparts reciprocatory movement to a follower roller 25 carried by a second class lever arm 26 pivoted at 27 and adapted to communicate its movement to a tape feed arm 28. At the opposite extremity of arm 28 there is pivotally carried in upright position a tape feed pawl 29. The reciprocatory movement of pawl 29 which engages the teeth of a ratchet wheel 31 imparts step-by-step motion to a tape feed shaft 32 which carries a sprocket feed wheel 33 whose pins coincide with the central row of perforations conventionally provided in control forms of the class employed in connection with permutation signal operating mechanisms. A spring 34 urges lever arm 28 in a clockwise direction about pivot 27 until its horizontally extending ledge 35 impinges upon an adjustment screw 36 which extends through the reciprocating lever 26 giving to the tape feed pawl 29 an operative cycle as represented by the curve 29 in Fig. 3. It will be noted, however, that the movement of the tape feed pawl 29 upwardly does not cause the movement of the tape but that this is done by spring 34 during the receding part of the curve.

- When the several feeler levers 12 are cyclically withdrawn by ball 16, the tape is advanced a distance of one step by the pawl 29, following which ball 16 is returned, permitting the individual springs 15 to urge their associated levers 12 in a counterclockwise direction. The presence or absence of a hole in the tape determines finally the distance of angular movement of any of the levers 12, depending upon whether the feeler pins 13 pass through the tape as where a perforation is encountered or whether they are blocked by the tape as where an imperforated position is found. The setting of the combined set of levers 12 is thereafter communicated by an associated set of transfer levers 37, Fig. 1, to a set of intermediate connector bars 38. This operation occurs at a time indicated by the hump in the curve 37 of Fig. 3, and may be seen to complete its full rocking motion during the time that the feeler levers 12 are sensing the tape. This operation is motivated by cam 24 upon whose peripheral surface there rides a follower roller 39 carried by one arm of a bell crank 41 whose other arm supports a transversely extending shaft 42 upon which the several transfer levers 37 and special transfer lever 49 are rotatably supported. Counterclock-

wise movement of bell crank 41 thrusts the transfer levers 37 upwardly, causing their T-head projections 43 to encounter ones or the others of the feeler lever shoulders 44. In accordance with the positions of the several levers 12, the transfer levers 37 are rocked clockwise or counterclockwise, causing their disc extensions 45, Fig. 2, to move the connector bars 38 and 51 correspondingly.

The connector bars 38 thereby receive a setting which corresponds to the perforations in the tape during each given cycle of operation and they in turn communicate this setting to a set of notched code selector bars 46.

Intermediate the tape sensing levers 12 there is pivotally supported on shaft 14 a transfer setting lever 47 resembling somewhat the general class of levers 12, but differing therefrom in that it is not provided with a sidewardly extending arm which carries a feeler pin 13, nor is the lever 47 provided with a horizontally extending projection 18 served by the reciprocating power ball 16, but in lieu of a projection 18, this lever carries a downwardly and leftwardly extending arm 48. As may be understood from the absence of a feeler pin 13, lever 47 is not positioned under the control of the presence or absence of a perforation in the control form but instead is positioned by a selectably initiated device which is responsive to repeated character signals.

Cooperating with the transfer setting lever 47 is a transfer lever 49 similar to transfer levers 37 and a connector bar 51 resembling connector bars 38. Instead of bar 51 being articulated to a code selector bar 46, however, it is provided instead with a so-called blocking bar 52 whose projections 53 are distributed so as to clear each of the individually selectable pull bars 54 under normal conditions when any one of them is otherwise receivable within the code notches appearing in the general class of code bars 46, and to block the selective movement thereof during an idle cycle of rotation as will be more fully explained hereinafter.

In contradistinction to the general class of pull bars 54 there may be noted in Fig. 1 a pair of certain function performing pull bars 540, the purpose of which is explained in the above referred to Patent No. 2,090,654. The lug attributes of blocking bar 52 are designed to normally prevent or block the selective clearance of pull bars 540 while the projections 53 clear the general class of pull bars 54, as indicated in Fig. 2. Subsequently when blocking bar 52 is shifted, however, either in accordance with the repeat selection bail or in accordance with a rail shift delay operation, a reversal of conditions is effected with the projections 53 blocking the general class of pull bars 54 but affording a selecting clearance (in the event of a rail shift signal) to the rail shift pull bars 540.

Each of the connector bars 38 and 51 carries at its upper edge a saw tooth cam projection 55 (Figs. 1 and 2). The positions which may be assumed by the several cam projections 55 may vary as indicated in Fig. 2, depending upon the relative position of the connector bars 38 and 51. Presented intermediate the two aforesaid positions and in the path of travel of the projections 55 is a transversely extending bail shaft 56 carried by a repeat signal selecting bail 57. The latter member is pivoted about shaft 58 and comprises several integrally formed extremities including a blocking arm 59 which extends unwardly and rightwardly, as viewed in Fig. 2, a blocking arm

61 which extends downwardly and rightwardly, and a blocking arm 62 which extends upwardly and leftwardly. In addition to these arms, a vertically extending arm 63 termed a latch arm also is integrally formed with lever 57 and is adapted to be engaged by a shoulder 64 presented by the foremost extension of a horizontal arm 65 of a latch ball 66. Ball 66 is urged in a clockwise direction by a spring 67, Fig. 2, and is limited in its movement by the engagement of a follower roller 68 carried thereby which rides the periphery of latch release cam 69 secured to and therefore rotatable with the record reader operating shaft 22.

In addition to its control of ball 66, latch release cam 69 also governs the operation of a bell crank assembly comprised of a lever 71, a lever arm 72, and a spring 73 which tends to hold the assembly yieldably together, and the angle between lever 71 and lever arm 72 constant. The cooperation between members 71 and 72 is determined by the abutting relation of a projection 74 carried by lever arm 72 and a blocking arm 75 carried by lever 71, Fig. 2. It will be seen that cam 69, during its rotation in a clockwise direction first releases the repeat selecting ball latch 66, as indicated by the hump in curve 57-69, Fig. 3, and thereafter upon encountering the follower roller 70 of lever 71 causes the counterclockwise rotation of the bell crank assembly comprising lever 71 and arm 72, as indicated by the hump in curve 81-69. Curves 57-69 and 81-69 have been illustrated as separate curves, though they represent the mechanical result of the same actuating element; namely, cam 69 performing upon two independent mechanisms. The extremity of arm 72 is presented beneath the downwardly and leftwardly extending arm 48 of transfer setting lever 47, causing the latter under the original actuation of cam 69 to be shifted clockwise against the tendency of its individual spring 15 not shown. This movement on the part of transfer setting lever 47 from its so-called marking position to its spacing position under the cyclic stimulation of latch release cam 69 merely constitutes an idle operation ordinarily because of the fact that before its associated T-shaped transfer lever 49 can communicate the change of position to its articulated bars 51 and 52, the apex of cam 69 moves on permitting the bell crank assembly 71-72 and transfer setting lever 47 to resume normalcy. The contingency of repeated character signals results in a different response on the part of members 47, 81, and 71-72 as will be understood later.

As stated before, the cam projections 55 in either of their rest positions may be found on one side or the other of the transversely extending rod 56, but in passing from one position to the other they engage rod 56, causing the latter to be cammed upwardly to rotate the repeat selecting ball 57 against the tendency of its spring 76. This movement of ball 57 is permitted during each cycle when latch 66 is released by cam 69, freeing the upstanding projection 63 which is normally withheld by shoulder 64. Thus, while the initiation of a cycle of operation, as evidenced by the rotation of shaft 22, causes repeat ball 57 to be freed and to rotate counterclockwise under the stimulus of spring 76, rod 56 dropping between the projections 55, it will be understood that subsequently in the cycle when the T-levers 37 are shifted in accordance with a change of signal that the movement of connectors 38 and 51 camming rod 56 upwardly, through the agency

of cam projections 55, serves in this way to restore ball 57 to its latched position. Only in the event of repeated signals in which case connectors 38 and 51 remain dormant is ball 57 permitted to continue in its counterclockwise position beyond the period of a single cycle of operation.

As a result of its movement, the upwardly and rightwardly extending arm 59 of ball 57 shifts so that its foremost extremity 77 is presented behind the sidewardly extending lug 78 carried by an integral arm 79 of tape feed arm 28, preventing the latter from being rotated clockwise by its spring 34 and arresting the further movement of the tape momentarily.

A companion lever 81 also pivoted on shaft 58 is provided on one of its arms with a stop lug 82, its other arm 83 being connected through spring 84 with the blocking arm 61 of ball 57. In this way, spring 84 tends to hold lever 81 in the position indicated in Fig. 2 with respect to the ball 57. Upon the counterclockwise rotation of the latter, however, a lug 85 carried by lever 81 comes into engagement with the blocking arm 75 of the lever 71, which forms part of the aforementioned bell crank assembly for shifting the transfer setting lever 47. In so doing, the spring 84 becomes distended slightly until an instant subsequently in the cycle of rotation of shaft 22 when the apex of cam 69 encounters the follower roller 70 of lever 71. This event causes lever 71 to be rotated counterclockwise until its blocking arm 75 is withdrawn from the path of lug 85. Thereafter spring 84 being under tension causes lever 81 to continue in a counterclockwise direction until lug 85 falls behind arm 75. This causes lever 71 to remain in its counterclockwise or operated position, after the apex of cam 69 has passed, imparting through spring 73 and lever arm 72 a clockwise torque to lever 47, and shifting the latter from its normal position which coincides with a marking signal to its opposite position coinciding with a spacing signal.

When upon the subsequent rotation of cam 24 carried thereby causes the operation of transfer bell crank 41, the particular T-shaped transfer lever 49 associated with the transfer setting lever 47 will then shift connector 51 rightwardly, causing its projection 55 to cam out rod 56 and rock ball 57, in this way restoring the latter to its latched condition behind the shoulder 64 of latch 66. As a further result of the movement of connector bar 51, blocking bar 52, which is normally at rest in its marking position, is now shifted rightwardly, presenting its projections 53 into the path of the several push bars 54 and momentarily preventing the particular one of them which happens to be otherwise in a selected condition from consummating its operation and performance. The camming of rod 56 results in a clockwise rotation of repeat selecting ball 57 and the withdrawal of blocking projection 77 from behind the lug 78 of tape feed arm 28. Consequently there is permitted the reciprocatory movement of tape feed arm 28 under the actuation of cam 23 and spring 34 moving the tape step-by-step in its normal procedure until another plurality of similar character signals is encountered. Meanwhile the continued rotation of shaft 22 again rocks the T-shaped transfer levers 37 causing their lugs to collide with those of the tape-feeler levers 12 and the setting lever 47 but the only change of signal noted at this

time will be the reshift to marking position of lever 47. Accordingly, connector bar 51 restores, withdrawing blocking bar 52 from its effective position.

- 5 To prevent the selection of the repeat selecting bail 57 in response to certain repeated character signals, selectable blocking elements are provided which have been indicated 86 and 87. These members include transversely extending
- 10 bail rods 88 and 89 each of which is presented opposite a transverse alignment of notches 91 corresponding in distribution to the particular signal for which repeated character delay is to be thus blocked out.
- 15 Among the signals for which repeated character delay is to be blocked out, bails 86 and 87 contemplate particularly the so-called "blank" and "rubout" signals. Upon the selection of either of these levers, its bail rod 88 or 89 is
- 20 received within its associated transverse alignment of notches 91. When this occurs, its upstanding portion is presented in front of one of the projections 92 of arm 62 so that if the same signal be repeated, the failure of movement of
- 25 any of the connectors 38 or 51 does not result in the selection of bail 57 by reason of the intervention of lever 86 or 87. Thus, while bail 57 is made responsive to repeated character signals generally, the means 86 and 87 illustrate
- 30 one mode of excepting certain signals from the class to be served by the selection of repeat bail 57.

- The reference character 93 illustrates a duplex rail delay selecting lever indicated 76 in Patent
- 35 2,090,654 referred to above. This element is selectively conditioned to interpose a time delay interval during the movement of the shiftable duplex rail and means are provided to prevent the selection of the repeat selecting bail 57 as
- 40 a result of the continued operation of shaft 22 during the time in which the duplex rail is being actuated. For this purpose a downwardly and leftwardly extending projection 94 is integrally
- 45 formed with lever 93 to be presented opposite a sidewardly extending lug formed with arm 61 of lever 57. When duplex rail selecting lever 93 is selectively actuated, it pivots about point 95 until projection 94 is brought into alignment
- 50 with the lug of arm 61. During the succeeding cycle of rotation of shaft 22 because the connectors 38 and 51 remain dormant, the lever 57 might otherwise seek its selected or operated position due to a failure of the cam projections
- 55 55 in ejecting the transverse shaft 56, but because arm 61 is blocked by portion 94, this selection is prevented.

Operation

- As has been explained above, Fig. 3 is a timing
- 60 chart featuring the periods of operation of certain mechanisms illustrated in Figs. 1 and 2. The curve indicated 29 represents the period and extent of operation of the tape feed pawl 29. Its lever 28 is actuated by an arm 26 under the initial
- 65 influence of cam 23. Accordingly, as may be noted at the start of a cycle, pawl 29 is moved upwardly to engage a new tooth in ratchet wheel 31. It remains in this position until nearly 260°
- 70 of rotation, whereupon it descends, actuating the tape feed sprocket shaft 32. Curve 12 represents the movement of the tape sensing levers 12. At the beginning of a cycle these levers are permitted to enter a row of perforations in the tape, as shown by the rise of the curve. The levers rest
- 75 in this position for a short time. This is repre-

sented by the plateau portion of the curve and in this position levers 12 continue until shortly after 200° of revolution, at which time they are withdrawn. The instant of withdrawal of levers 12 may be noted as preceding by a small margin the instant at which pawl 29 actuates shaft 32 to advance the tape one step distance.

Curve 57—69 represents the movement of latch pawl 65 in its release of the repeat selection element 57. This release operation is consummated within the first 40° of rotation, following which latch pawl 65 is not again actuated during a given cycle. Curve 37 represents the movement of transfer levers 37, which operation is performed by cam 24 acting on bell crank lever 41. Comparing curve 37 with curve 12, it will be noted that the transfer operation is completely consummated within the span during which the sensing levers 12 are in their upper or tape sensing position. Finally, curve 81, 69, 71, etc., represents the instant at which cam 69 engages and moves the bell crank assembly, including arms 71 and 72. This operation is consummated within the final 100° of rotation. In the event that auxiliary arm 81 is pressing against projection 75, as is the case during a repeat signal selection, the actuation of lever 71 by cam 69 permits auxiliary arm 81 to pass projection 75, which thereupon will move behind extremity 75, holding lever 71 in its actuated position, and through its spring articulation 73 with arm 72, will cause transfer setting lever 47 to be moved to its spacing position and be found there upon the subsequent actuation of transfer levers 37 and 49. Accordingly, curves 81, 69, 71, etc., represents the instant of actuation of lever 71.

To illustrate how the present device functions in connection with repeated character selection where the characters exceed two in number, it will be supposed that a series of three repeated characters is received in consecutive order on a perforated tape. Accordingly there will be contemplated four cycles of operation, the first two coinciding with the first two similar signals the third cycle coinciding with an idle rotation for the purpose of interposing a single cycle of revolution to obtain a delay, and a fourth cycle for denoting the incidents of operation during which the mechanism performs a delayed operation and is restored to normal performance.

Under ordinary conditions of operation, the repeat selecting bail 57 may be found in its unoperated position latched behind shoulder 64 of latch member 66 as illustrated in Fig. 2. At the initiation of the first cycle of rotation which may be observed in terms of rotation of shaft 22, cam 23 acting on follower roller 25, rotates lever 26 counterclockwise, sending the pawl feed arm 28 upwardly in opposition to its return spring 34. At about the same time, cam 69 encounters roller 68, unlatching member 66 and freeing bail 57 which thereupon drops into selected position, viz., with rod 56 between the projections 55 and lug 77 behind lug 78. Also at this time, due to the rotation of cam 21, the several feeler levers 12 are permitted to respond to their springs 15 and to sense the particular condition in the tape then in line with their feeler pins 13. Following shortly thereafter, the apex of cam 24 actuates the transfer bell crank assembly 41, causing the transfer levers 37 to be thrust against the feeler levers 12 and transfer setting lever 47. This movement of the transfer levers 37 is of short duration, and the bell crank 41 is promptly returned due to the short apex of cam 24.

Following the above operation and since the signal has already been communicated from the feeler levers 12 through the transfer levers 37 to the connectors 38 and 51 and thence to the several selector bars, cam 21 is permitted to withdraw the several feeler levers 12 in contemplation of a succeeding signal. Meanwhile, however the movement of connectors 38 and 51 has resulted in the camming out of rod 56 and in the rotation of ball 57 in a clockwise direction. Because at this time the latch 66 is found in its normal position, upstanding arm 63 of ball 57 is again latched behind shoulder 64. The tape feed cam 23 then withdraws its apex, permitting tape feed arm 28 to actuate pawl 29 and to advance the tape a distance of one step.

Meanwhile a signal having been communicated to the selector bars 46 there was permitted the selective conditioning of a particular pull bar 54. At the same time the apex of cam 69 encountered lever 71, which forms part of the bell crank assembly with lever arm 72, and in so doing, the two were actuated momentarily in contemplation of a repeat character signal. Because the particular signal differs from a preceding one, however, nothing resulted from this movement.

The mechanism has at this time completed one cycle of rotation and is about to enter upon a succeeding cycle where, in accordance with the supposition, a second character similar to the first occurs in the tape. The second cycle of rotation is similar to the cycle just described up to the point where transfer levers 37 are urged against the feeler levers 12 and transfer setting lever 47. In this case, because the signal is similar to the preceding signal there results no movement of the connector bar 38 or 51 when the transfer levers 37 are actuated, consequently ball 57, when released by a latch 66 and cam 69, is permitted to remain in its counterclockwise position presenting its projection 77 behind the lug 78 of integral arm 79 associated with the tape feed arm 28. This prevents the return movement of arm 28 at a time when cam 23 in the preceding cycle withdrew in favor of return spring 34.

As a further result of the inert condition of repeat selecting ball 57, companion lever 81 is permitted to travel to its counterclockwise position until lug 85 abuts the projection 75 pending the subsequent operation of cam 69, when lever 71 and projection 75 are withdrawn. Towards the conclusion of the second cycle, when the apex of cam 69 actuates lever 71, the assembly including arm 72 causes transfer setting lever 47 to be shifted to its space condition as aforedescribed, and this shift operation, which ordinarily exists for but a slight interval and is restored immediately, in the instant case continues because lug 85, under influence of spring 84, is now presented behind blocking arm 75, latching the latter member in its so-called operated position. This in substance is the situation of the several elements at the conclusion of the second cycle of rotation of shaft 22 and when the latter enters upon its third cycle of rotation.

The release of latch 66 by cam 69 at the start of the third cycle is ineffectual because selecting ball 57 was not restored during the preceding cycle of rotation. Also the actuation of tape feed lever 26 by cam 23 is of no consequence because tape feed arm 28 has been blocked in its return movement and continues to remain in its upstanding position without having advanced the tape. The actuation of the feeler levers 12 at this time is also of no consequence because the

preceding signal continues in the tape sensing position. The first effective operation in this cycle results when ball 24 actuates the transfer levers 37, causing a shifting of the connecting rod 51 which has meanwhile received a different signal from the preceding one due to the movement of transfer setting lever 47 by the bell crank assembly 71-72. As a result of the movement of connector bar 51, rod 56 of repeat selecting ball 57 is again cammed out, causing the upstanding arm 63 to be latched behind shoulder 64 of latch member 66. Meanwhile the shifting of connector bar 51 carrying with it blocking bar 52 causes the latter to assume its spacing position wherein all character push bars are blocked and their selection accordingly prevented. This intervention on the part of blocking bar 52 prevents another selective operation among the pull bars 54 which would otherwise result because the code bars are still positioned in accordance with the second signal.

The relatching of ball 57 causes its projection 77 to be withdrawn and the movement of tape feed arm 28 reinstated, so that at the conclusion of the third cycle, the tape is advanced to align the third consecutive signal opposite the pins 13 of the feeler levers 12. The return movement of ball 57 carrying with it companion lever 81, also releases the bell crank assembly 71-72, permitting transfer setting lever 47 to resume its normal position. Thus at the conclusion of the third cycle the several elements are restored in contemplation of the third signal and the fourth cycle of rotation. The sensing of the third consecutive signal and the consequent operation of the several elements corresponds identically with the aforedescribed operation in connection with the first signal and thereafter the operation of the tape sensing mechanism continues normally until another plurality of similar signals in consecutive sequence is encountered.

While the present invention has been explained and described with reference to a particular embodiment, it will be evident that numerous modifications and variations may be instituted without departing from the spirit or scope thereof. Accordingly it is not intended to be limited by any of the details described in the foregoing specification and illustrated in the accompanying drawing, except as indicated in the hereinafter appended claims.

What is claimed is:

1. In a linecasting and composing machine, an automatic control mechanism including a set of tape sensing elements, a set of coded selecting members, means for communicating a setting from said tape sensing elements to said code selecting members, a plurality of selectable elements each individually conditioned by said selecting members in accordance with a signal communicated by said tape sensing elements for effecting a line composition function, a special selectable element, and means selectively conditioned by said special selectable element for producing a preliminary control function to qualify certain of said line composition functions.

2. In a selector mechanism, a set of tape sensing elements, a plurality of function bars, selector means responsive to the positioning of said tape sensing elements for conditioning said bars for actuation individually, and a selectable member responsive specially to duplicated positionings of said elements for establishing a preliminary qualification for ones of said function bars.

3. In a tape controlled apparatus, a plurality of elements to be individually and selectively conditioned, a set of code bars variously presentable having notch and lug attributes for affording a selective clearance to each of said elements individually in accordance with a permutation signal, a set of tape sensors, and means for transferring a signal from said tape sensors to said set of code bars including a corresponding set of connector bars and an element selectively operated by a dormant condition of said connector bars.
4. The combination set forth in claim 3 including means to restore said selectively operated element automatically following the expiration of a predetermined time interval.
5. An automatic control apparatus including a plurality of function performing members, a set of tape sensing elements, a continuously rotatable shaft, means under the control of said shaft for cyclically operating said tape sensing elements, means under the control of said shaft for cyclically transferring a reading from said tape sensing elements, selector members responsive to said reading for conditioning said function performing members, and a device cyclically conditioned under the control of said operating shaft and restored by said sensing elements.
6. A record reader mechanism including means for advancing a perforated tape, means for sensing transverse areas of said tape for selectively conditioning a function performing element, and a delay initiating device selectively conditioned by a plurality of related signals occurring in a predetermined sequence for performing a supervisory selective operation.
7. An automatic control device including a plurality of pull bars to be individually selected, a set of selector bars having notch and lug attributes arranged to be variously positioned for individually conditioning said pull bars, a blocking bar associated with said selector bars, a set of feeler levers, means for periodically withdrawing and presenting said feeler levers to a transverse surface area of a control form, a transfer setting lever associated with said feeler levers, a set of transfer levers for communicating the setting of said feeler levers and said transfer setting lever to said selector bars and said blocking bar respectively, including a corresponding set of connector bars, a tape advancing apparatus, and means responsive to an inert condition of said connector bars for blocking the operation of said tape advancing apparatus.
8. In a tape controlled selector mechanism, a set of code selecting elements having notch and lug attributes permutatively arranged to present an individual selective clearance for each positioning thereof, a plurality of selectable members each disposed opposite a transverse position of said elements in alignment with an associated clearance, and a member conditioned before each positioning of said elements and thereafter restored in response to a changed position of any of said elements.
9. In a tape controlled selector mechanism, a continuously rotatable operating shaft, a set of notched selecting elements cyclically positioned during each rotation of said shaft, and a selectable member conditioned during a cycle of rotation of said shaft in response to an inert condition of said selecting elements.
10. In a tape sensing mechanism, a plurality of feeler levers having transfer projections, an associate lever in alignment with said feeler levers having similar transfer projections, a set of transfer levers cyclically operable to communicate the setting of said feeler levers and said associate lever to a corresponding set of coded selecting elements, a continuously rotatable shaft, cam means carried by said shaft for cyclically withdrawing said feeler levers simultaneously, and separate cam means carried by said shaft for withdrawing said associate lever.
11. The combination set forth in claim 10 including latch means for detenting said associate lever in its withdrawn position under signal control.
12. In a record reader mechanism, a set of notched permutation bars to be variously positioned for affording a selective clearance to each of a set of pull bars individually, a latched element cyclically released and cyclically restored to its latched position during the movement of said notched bars, tape feeding apparatus, and means for suspending the operation of said tape feeding apparatus under the control of said latched element.
13. In an automatic selecting device, a plurality of selecting code bars, an element cyclically conditioned following the movement of said code bars, and means responsive to certain signals for blocking the cyclic conditioning of said element.
14. In a selector mechanism, a set of longitudinally movable elements having associated with them notch and lug attributes for permutatively effecting a selection, a selector device comprising a transversely extending member traversing said elements and spring urged to cyclically assume its effective position, and cam means associated with said longitudinally movable elements for ejecting said transversely extending member during the movement of any of said elements.
15. In a code selector mechanism, a set of longitudinally movable selector members each having perpendicularly extending cam projections arranged to afford a clearance transversely between their extremities of movement, a transversely extending element spring urged to assume a position intermediate said extremities of movement, a latch for securing said transversely extending member to prevent its entering said intermediate position, and means for releasing said latch cyclically to permit said transversely extending member to descend between said projections into said intermediate position.
16. In a selector mechanism, a plurality of elements permutatively movable to effect individual code selections, cam means associated with each of said elements and presentable on one side or another of a transversely extending selective area, latch means, latch actuating means, and a selectable element having a portion extending over said selective area including spring means for urging said extending portion into said selective area when said latch means is actuated to free said selectable element.
17. In a selector mechanism, a set of selecting elements transversely shiftable to effect diverse permutative positions, a selectable member traversing said elements, projections integrally formed with said elements having cam surfaces, said projections being presentable at one side or the other of said selectable member in accordance with its position at a given selection, means for urging said selectable member between said projections during a dormant condition of said elements, and latch means for withholding said selectable member under the control of predetermined signal conditions.

18. In a tape sensing mechanism, a plurality of code members having notch and lug attributes, a continuously rotatable actuating shaft, a tape advancing mechanism, a device cyclically released by said actuating shaft and selectively conditioned by said code members for suspending the operation of said tape advancing mechanism, means actuated by said shaft subsequently during each cycle for restoring said device, and means under the control of an inert condition of said selecting members for disabling said restoring means.

19. In a linecasting and composing machine, an automatic control mechanism including a set of tape sensing elements, a set of coded selecting members, means for communicating a setting from said tape sensing elements to said code selecting members, a plurality of selectable elements each individually conditioned by said selecting members in accordance with a signal communicated by said tape sensing elements for effecting a line composition function, a specially selectable element, and means for selectively conditioning said specially selectable element in response to a plurality of like signals communicated from said tape sensing element for effecting a preliminary control function.

20. In a selector mechanism, a set of tape sensing elements, a plurality of function bars, selector means responsive to the positioning of said set of tape sensing elements for conditioning said bars, a specially selectable member, and means for conditioning said specially selectable member in response to the repeated conditioning of one of said function bars.

21. In a tape controlled apparatus, a plurality of elements to be individually and selectively conditioned, a set of code bars having notch and lug attributes and variously presentable for affording a selective clearance to said plurality of elements individually, a set of tape sensing members, means for transferring a signal from said members to said code bars, and an element selectively conditioned by a dormant condition of said code bars.

22. In a selector mechanism, a set of elements operated permutably in accordance with signal indications on a control strip, a plurality of function members, means responsive to the operation of said elements for determining the performance of said function members, a device responsive to consecutive similar control operations of said elements, and means controlled by said device for performing a preconditioning function.

23. In a tape controlled selector mechanism, a set of selector elements having notch and lug attributes, a plurality of selectable members individually conditioned in accordance with each disposition of said elements, and a selectable member specially responsive to an inert condition of said set of selecting elements for performing a supervisory function.

24. In a selector mechanism, a set of tape sensing elements, selector bars responsive to the positioning of said tape sensing elements, a plurality of function performing members individually conditioned by the disposition of said bars, and a selectable member responsive to duplicate consecutive conditioning of ones of said members.

25. In a signal controlled supervisory apparatus, a signal controlled selecting mechanism, a plurality of function members individually conditionable periodically in accordance with the

operation of said selecting mechanism, and a special function member conditionable by an idle period of said mechanism and prevented from being conditioned in response to a function member selecting operation of said mechanism.

26. A permutation code selector mechanism in which a set of code bars are cyclically shifted to present a permissive condition to one of a plurality of selectable members, the combination including a specially selectable member, notch and lug attributes associated with said selector mechanism and so arranged as to normally present a permissive clearance to said specially selectable member, and means responsive to a change of code in said selector mechanism for moving said specially selectable member to its non-selected condition.

27. In a selector mechanism, a plurality of selectable elements, means for selecting said elements individually in accordance with their related signals occurring in a record, a specially selectable element, and means for selecting said element under the control of consecutively occurring similar signals.

28. In a selector mechanism, a set of members having coded attributes, a plurality of elements individually conditioned by the permuted disposition of said members, a device for acting upon all of said elements for withdrawing any one of them following its selection, a specially selectable element, and means associated with said set of members for withdrawing said specially selectable element following its selection.

29. In combination, a set of bars having notch and lug attributes arranged in accordance with a permutation system, a plurality of function performing members of a general class each movable into an operative condition upon an individual placement of said code bars, a restorer for returning to a non-operative condition each of said members of said general class following its operation, a special class of function performing members, and means associated with said set of code bars for returning to a non-operative condition a member of said special class of function performing members following its operation.

30. In a signal controlled supervisory apparatus, a selector mechanism comprising a series of settable elements, a plurality of members individually prepared and operated in accordance with each setting of said elements, cyclically operating mechanism for setting said elements in accordance with control signals and for actuating a corresponding one of said members, means for partially disabling said mechanism, and a device for withholding said disabling means under the control of a change in setting of said elements.

31. In a selector mechanism, a set of code bars having permutably arranged notch and lug attributes to provide an individual clearance for each permutative disposition of said bars, a plurality of selectable elements aligned to respond individually to the clearances, a special member, notch and lug attributes in said bars associated with said member for affording a clearance thereto throughout all permutative conditions of said bars, and a blocking device for said special member responsive to a certain permutative arrangement of said bars for withholding it during such arrangement from entering its said clearance.

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DISCLAIMER

2,104,030.—*Maurus T. Goetz*, Chicago, Ill. TAPE CONTROLLED APPARATUS. Patent dated January 4, 1938. Disclaimer filed February 1, 1940, by the inventor; the assignee, *Teletypesetter Corporation*, consenting.

Hereby enters this disclaimer to the invention set forth in claim 27 of said Letters Patent.

[*Official Gazette February 27, 1940.*]