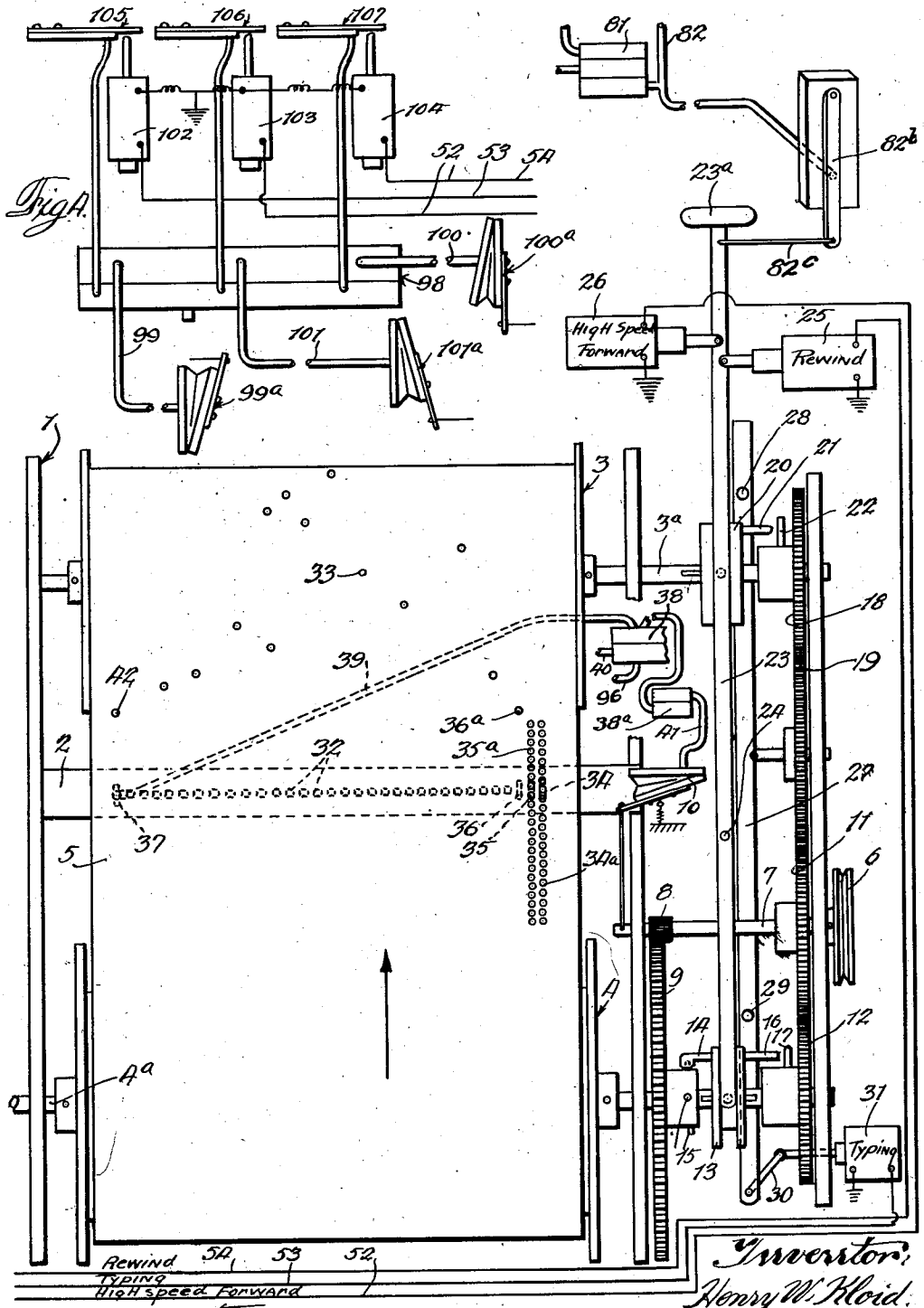
Aug. 11, 1942. H. W. KLOID 2,292,701

AUTOMATIC TYPEWRITER CONTROL

Filed Sept. 16, 1940 3 Sheets-Sheet 1



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AUTOMATIC TYPEWRITER CONTROL

Filed Sept. 16, 1940 3 Sheets-Sheet 2

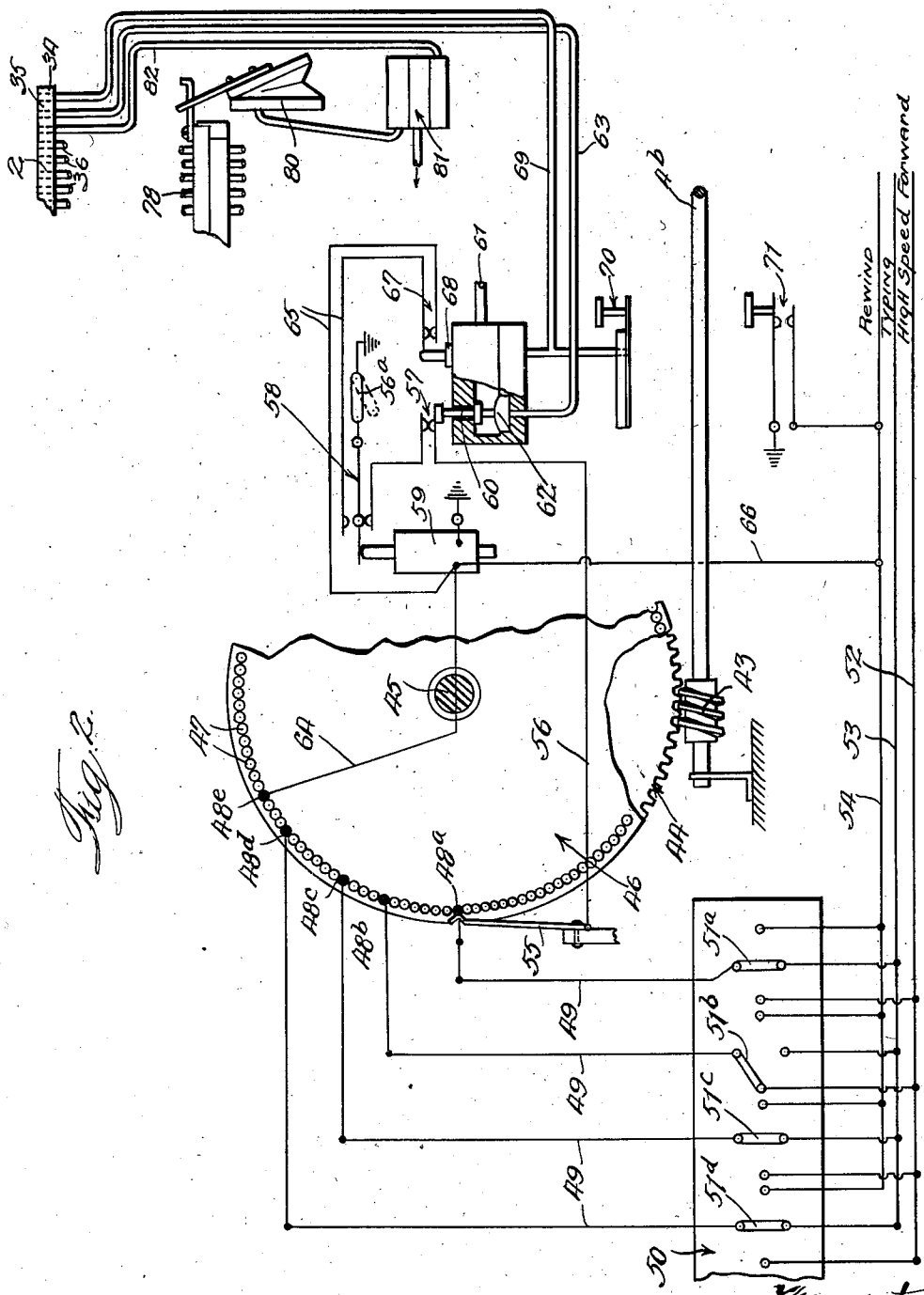


Fig. 2.

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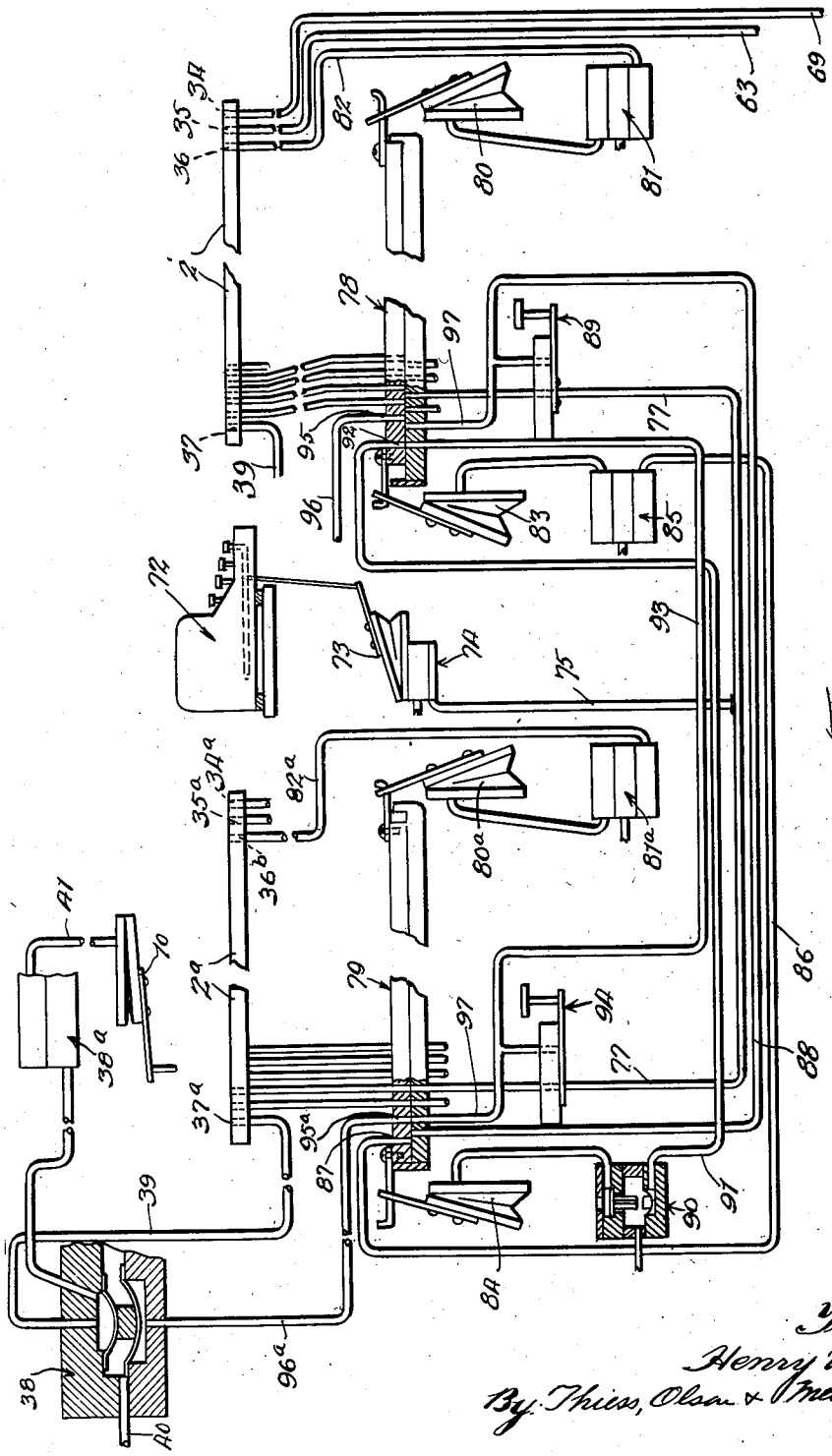


Fig. 3.

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2,292,701

UNITED STATES PATENT OFFICE

2,292,701

AUTOMATIC TYPEWRITER CONTROL

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Application September 16, 1940, Serial No. 356,922

10 Claims. (Cl. 197—20)

This invention relates to automatic typewriter controls and particularly to a control for operating a single typewriter, or a plurality of typewriters simultaneously, from any one of a plurality of record devices.

It is common practice to operate one or more typewriters from a moving record. That is, a plurality of form letters or paragraphs or any desired composition or compositions may consecutively be impressed on a record and the record may be operated by a suitable mechanism whereby impulses corresponding to the required typewriter operations may be transmitted to a typewriter and the consecutive paragraphs automatically reproduced on paper inserted therein.

In practicing the present invention, a plurality of record operating mechanisms may be used, and the operation, in so far as the record and record operating mechanism are concerned, may be substantially identical with that used for certain types of player pianos in which pneumatic impulses are transmitted to the key operating pneumatics through perforations in an elongated record sheet which moves over the usual tracker bar. The record sheets are wound on rolls, and each note is indicated thereon by the location of a perforation through the sheet. The record operating or driving mechanisms including the record holders, tracker bar, tracker bar nipples, etc., are commonly called "spool boxes" and, for convenience, may be so termed in this application.

In the present invention, a plurality of these record operating mechanisms, so-called spool boxes, preferably two, are used to operate a single typewriter, or, if desired, a plurality of typewriters may be used and the same letter or paragraph may be printed on all of the typewriters simultaneously through a pneumatic selecting and transmitting system by which any paragraph or series of preselected paragraphs may be printed from any of a plurality of records.

It is an object of the present invention to provide a mechanism and control therefor whereby predetermined paragraphs or sections of compositions may be selected from one or a plurality of records, and the device may then be automatically operated to write the paragraphs in consecutive order as preselected.

A further object is to provide a control mechanism whereby a single paragraph or section of a record may automatically be repeated as many times as required.

A particularly important object is to provide a control device whereby a plurality of record operating devices may selectively be used to operate a single typewriter and wherein suitable devices are provided to prevent operation of more than one record operating mechanism at one time.

It is also an object to provide an automatic device whereby, after desired paragraphs have been selected, the record automatically will move at a predetermined speed to the first selected paragraph and then at slow or typing speed during the printing operations; also in which the record may travel at high speed between separated preselected paragraphs and will be rewound at high speed after all selected paragraphs on a record have been printed.

It is also an object to provide a combined electrical and pneumatic typewriter control in which the various elements are interconnected and interrelated in a manner to enable quantity production of printed material from a plurality of records with a minimum of attention by an attendant.

Further objects will be apparent from the specification and the appended claims.

In the drawings:

Fig. 1 is a somewhat diagrammatic top view of one of the record operating machines or so-called spool boxes.

Fig. 2 is a diagrammatic view of the predetermining selector means for controlling the record operating mechanism.

Fig. 3 is a diagrammatic view of the pneumatic typewriter control mechanism, including the pneumatic interlocking means, whereby the operation of more than one record operating mechanism at one time is prevented.

Fig. 4 is a diagrammatic view of a pneumatic control means which may be substituted for a portion of the electrical control means of the record operating mechanism shown in Fig. 1.

Referring to the drawings in detail, the embodiment disclosed herein comprises a plurality of record operating mechanisms or spool boxes, only one of which is shown in Fig. 1, as they may be identical in construction and operation. Any suitable number of these mechanisms may be used by properly connecting the pneumatic circuits, as will be well understood from the description to follow. However, in the drawings the pneumatic typewriter control system shown in Fig. 3 is adapted for use in connection with two record operating spool boxes.

The record operating mechanisms, as shown in Fig. 1, may be substantially identical with the record operating portion of the player piano machine shown in Figs. 1 and 7 of Patent No.

1,561,199, issued to Wilcox November 10, 1925, for Automatic player piano. The dial mechanism shown at the left of Fig. 1 of the Wilcox patent is, however, omitted in the present invention, and the selecting mechanism shown in applicant's Fig. 2 is substituted therefor.

The record operating mechanism is shown only diagrammatically in Fig. 1 of the instant application for the reason that the general construction thereof will be apparent from an examination of the previously mentioned Wilcox patent. The device comprises a frame 1 having the usual tracker bar 2 thereon and suitable spools or roll holders 3 and 4 oppositely disposed with respect to the tracker bar so that suitable record rolls may be mounted thereon and a record sheet 5 extended over the tracker bar in the usual manner and operated by suitable mechanism.

The machine may be operated from any suitable source of power, preferably an electric motor adapted to drive a pulley 6 secured to a shaft 7. The shaft 7 is mounted in suitable bearings in the frame and the inner end of the shaft is provided with a pinion 8 normally in mesh with a gear 9. The gear 9 is rotatably mounted on the shaft 4a of the lower spool 4 so that, if the gear 9 is clutched to the shaft 4a, the record will travel in the direction of the arrow at slow speed or so-called typing rate as the record is wound from the upper spool onto the lower one.

The shaft 7 is loosely mounted in its bearings or otherwise supported in such a manner that the inner end, including the pinion 8, may be raised by means of a pneumatic 10 when the pneumatic is collapsed by a control which will be described later. The raising of the shaft 7 moves the pinion 8 out of mesh with the gear 9 and thereby prevents continued operation of the record. A gear 11 is also secured to the drive shaft 7 and is in mesh with a similar gear 12 loosely mounted on the shaft 4a so that, when this gear 12 is clutched to the shaft 4a with the gear 9 disengaged therefrom, the record will be driven in the direction of the arrow at a so-called high speed forward as distinguished from the typing speed.

In order to selectively clutch either gear 9 or gear 12 to the shaft 4a, a clutch 13 is slidably keyed on the shaft 4a and provided with an inwardly extending arm 14 having a downturned end adapted to be engaged by one of the pins 15 on the hub of the gear 9 when the clutch is in the central position shown. Therefore, when the pinion 8 is in mesh with the gear 9 and the clutch 13 in the central position shown, the lower spool will be driven in the direction of the arrow at slow or typing speed. The clutch 13 is also provided with an outwardly extending arm 16 which, when the clutch is moved to the right, will engage a pin 17 on the hub of the gear 12 and at the same time this movement of the clutch will release the pin 15 from the arm 14 of the gear 9 so that the lower spool will then be driven at a high speed forward by means of the gear 12 and clutch 13.

A gear 18 is rotatably mounted on the shaft 3a of the upper spool 3, and this gear is driven from the drive shaft gear 11 by means of an idler 19. A clutch 20 is slidably keyed on the shaft 3a and is provided with an outwardly extending arm 21 adapted to engage a pin 22 on the hub of the gear 18 when the clutch is moved to the right from the position shown in Fig. 1. When the clutch is engaged with the gear 18, the upper spool 3 will be driven to rewind the record thereon.

In order to operate the clutches 13 and 20 simultaneously so that one may always be out of engagement when the other is engaged, a clutch shift-lever 23 is pivoted at 24 and provided adjacent each end with portions engaging in suitable annular grooves in the clutches in the usual manner, so that, when the upper end of the lever is moved to the right to cause engagement of the pins 21 and 22 of the upper clutch to drive the rewind spool, the lower clutch 13 will be moved to the left to completely disengage the clutch 13 from the gears 9 and 12. When the upper end of the lever 23 is moved to the left, the upper or rewind clutch 20 will be disengaged and the lower clutch will engage only the gear 12 to drive the record at the high speed forward, and, when the lever is in the central vertical position shown, the clutch 13 will be engaged with the gear 9 only so that the record will be driven at a typing speed through the pinion 8. Also, when the pinion 8 is raised out of mesh with gear 9 by collapsing the pneumatic 10, the record may automatically be stopped when moving at the typing rate and without moving the clutches from the "typing" position shown.

The clutch lever 23 may be electrically controlled by a suitable paragraph selector and control mechanism shown in Fig. 2 which will be described later. For use in connection with such control mechanism, a solenoid 25 is secured to the upper end of the lever 23, so that, when this solenoid is energized, the upper or rewind clutch 20 will be moved to the right and the lower clutch completely disengaged and the record will be rewound on the upper spool at high speed. A second solenoid 26 is also secured to the upper end of the clutch lever and, when this latter solenoid is energized, the lever will be moved in the opposite direction so that the rewind clutch will be completely disengaged and the lower clutch 13 will be moved to the right to engage the gear 12 to thereby cause the record to be wound on the lower spool at high speed forward.

As previously stated, when the clutches are in the central position shown in Fig. 1, only the gear 9 is engaged by the clutch to drive the record at typing speed. The clutch lever 23 may be moved to this central position from either of the angular positions just described by means of a rocker bar 27, which bar may be similar to that shown in Fig. 7 of the previously mentioned Wilcox patent and which is provided with outwardly extending arms 28 and 29 positioned on opposite sides of the pivot 24 of the clutch lever. It will be apparent that, when this bar 27 is rocked in one direction, the outwardly extending arms 28 and 29 will move the clutch lever and the clutches controlled thereby to the central position shown. At the lower end of the rocker bar 27 is an outwardly extending arm 30 to which is connected a solenoid 31 which, when energized, will operate the bar 27 to thereby center the clutches in the typing position as shown.

The tracker bar 2 is provided with a series of the usual nipple openings 32 which are connected to the typewriter control devices by means of suitable pneumatic tubes in the usual manner. The nipple openings 32 co-operate with perforations 33 in the record to admit atmospheric pressure selectively to the typewriter control devices. The tracker bar 2 is also provided with a plurality of slot-like nipple openings 34, 35, 36, and

37, nipple openings 34 and 35 being connected by pneumatic tubes to the record control mechanism shown in Fig. 2 to control the repeat movements and the paragraph selecting movements, respectively, of the record in accordance with special cooperating perforations in the record.

Nipple slot 36 is connected to a typewriter control device by a suitable pneumatic tube to control certain self-locking features so that only one record may be operated at one time.

Tracker bar nipple slot 37 is connected to a lock pouch valve 38 through a conduit 39. The lock pouch valve 38 is connected to the usual vacuum pump or vacuum system by a conduit 40, so that at least a partial vacuum is maintained. The valve 38 controls a secondary valve 38*a*, which latter, in turn, controls the pinion operated pneumatic 10 previously referred to through a conduit 41, so that, when atmospheric pressure is admitted to the tracker bar nipple slot 37 by means of a corresponding record stop special perforation 42, the secondary valve 38*a* will operate in the usual well known manner to cause the pneumatic 10 to be collapsed and thereby disengage the pinion 8 from the typing speed gear 9 to thereby stop the movement of the record, even though the clutch 13 is in the central or typing position. The construction and operation of secondary valves for controlling pneumatics is well known and a detailed description of such valves as used in connection with this invention is believed to be unnecessary.

The lock pouch valve 38 is also of a well known type and is illustrated in section in the upper left-hand corner of Fig. 3. This is preferably a multiple valve so that a plurality of spool boxes may be controlled therefrom, although in the drawings only one valve is shown.

The shaft 4*a* of the lower record spool is extended rearwardly at 4*b* for the purpose of driving the paragraph selector control mechanism shown in Fig. 2. The shaft extension 4*b* is provided with a worm 43 secured thereto and in driving mesh with an enlarged worm wheel 44 so that the movement of the worm wheel is synchronized with the movement of the record and the worm wheel always travels in a direction corresponding with the direction of movement of the record and in synchronism therewith.

The worm wheel 44 is rotatably mounted on any suitable support at 45 and an insulating disc 46 is secured thereto or may form an integral part thereof for rotation therewith. The disc 46 is provided with an annular series of closely adjacent holes or sockets 47 adapted to receive electrical contact pins 48 which may be positioned in holes corresponding to the position of the various paragraphs on a record. Also, pins may be positioned to correspond with corresponding special perforations in the record, which special perforations are adapted to control the shifting of the clutches 13 and 20 of the record operating mechanism. The contact pins are adapted to successively complete electrical circuits during rotation of the disc 46 to thereby automatically control the movement of the record for high speed forward, selection of paragraphs to be printed, rewind at high speed backward, and repeat operations when it is desired to print a number of copies of the entire record or any part thereof.

Each pin 48 when inserted forms the contact terminal of an electrical conductor 49 leading to a switchboard 50 and connected to the switch arm of a three-way switch 51 as shown, and these switches may individually be positioned to complete a circuit through any one of conductors 52, 53, or 54 leading to the high speed forward, typing, and rewinding solenoids, respectively, which latter are shown in Fig. 1 and are connected to one side of a suitable electrical power source so that, when any pin 48 is grounded or otherwise connected to complete a circuit, a solenoid, preselected by the position of the associated switch 51, will be energized and the record operating mechanism will be controlled accordingly.

The electrical connection of the terminal pins 48 may be made through suitable collector rings, and the conductors 49 may electrically connect thereto by means of brushes or the like, or, as the disc 46 never makes more than one revolution and return, the pins may be merely terminals on the wires 49, which latter may be sufficiently flexible for the purpose. Such constructions are well known and further description is believed unnecessary. It is also contemplated that the sockets 47 and the contact 55 may be transposed if desired, that is, the sockets may be stationary and the contact 55 movably mounted.

In order to ground consecutive pins 48 in the embodiment shown to selectively energize the solenoids during operation of the record, a spring contact 55 is positioned in the path of the pins and connected to ground through a conductor 56 and series switches 57 and 58 (Fig. 2). A manually operable switch 56*a* is in series in the conductor 56 so that it may be opened to prevent automatic operation of the device until a record has properly been positioned over the tracker bar and the pins 48 inserted for the desired selection.

Switch 58 in the ground line of contact 55 is a two-way switch normally connecting the spring contactor 55 to ground through switch 57 when this switch is closed from the record by the select perforations 35*a*. However, switch 58 may automatically be operated by a solenoid 59 controlled by the last pin 48*e* of the series, so that the ground circuit of contactor 55 is broken and a so-called locking circuit is connected to the ground to thereby energize the clutch operating rewind solenoid 25 and cause the record to be rewound at high speed after the last paragraph of a selected series of paragraphs has been written. This locking circuit and its operation will be described later.

The switch 57 in the ground circuit of contactor 55 is intermittently held closed by a pneumatic valve 60, which latter is connected to a vacuum source through a conduit 61. The valve 60 is operated in the usual well known manner by means of a pouch 62. The pouch chamber is connected to the tracker bar nipple opening 35 by a conduit 63 so that, as long as the nipple opening 35 is open to atmospheric pressure through the series of perforations 35*a* or any equivalent series in the record 5, the switch 57 will remain closed. The series of perforations 35*a* functions in the same manner as a long slot. Small perforations in series are used to prevent distortion of the record. A series of these perforations 35*a* is preferably provided at the beginning of each paragraph or section of the record and for convenience are called "select" perforations.

The preselecting of paragraphs or sections of a record to be printed is accomplished as follows: The switch 56*a* is opened to break the power circuit and, with the motor "off," the operator inserts a record roll in the upper spool 3 and se-

cures the end of the record to the lower spool 4. The record is then moved by hand until the first series of the select perforations 35a is over the selector nipple opening 35 in the tracker bar. A double width contact pin 48a (Fig. 2) is then inserted in a hole 47 in disc 46 in a position to electrically engage the spring contactor 55. The switches 51 are then preferably all moved to high speed forward position and the electric power is turned on by closing switch 56a. The high speed forward solenoid 26 (Fig. 7) will immediately be energized and the record will operate forward at high speed. As soon as the second paragraph is reached, the operator stops the record by turning off the electric power and he then moves the record by hand to bring the series of select perforations 35a belonging to the second paragraph into the same relative position on the tracker bar as described for the first paragraph. The second contact pin 48b (Fig. 2) is then inserted in a hole in the disc 47, where it is in contact with the spring contactor 55 and the power again turned on. This process is repeated through all paragraphs or at least to the last paragraph which it is desired to print. At the end of the record, or at the end of the last selected paragraph, the rewind pin 48e is inserted in the proper position to start the rewind when it reaches the contactor 55. The switches 51 should then all be set in accordance with the predetermined paragraph selection and the power turned on for rewind of the entire record.

The automatic rewind of the entire record by the rewind pin 48e is accomplished as follows: When the pin is inserted to engage the contactor 55 and the power is then turned on, or when the pin reaches the contactor during the normal automatic operation of the device, a circuit is completed from the pin 48e through a conductor 64 to energize the solenoid 59 to thereby operate switch 58 and break the ground circuit of the contactor 55 and connect the rewind circuit directly to the ground through a so-called locking circuit 65 and conductor 66. This circuit also retains the solenoid 59 energized until the rewind is completed. The locking circuit 65 is provided with a normally closed series switch 67. The switch 67 may be operated to break the locking circuit by means of a pneumatic valve 68 which may be identical with the valve 60 and is controlled from the record by means of a series of perforations 34a which are coextensive with the selection perforations at the start end only of the record and are in line with the tracker bar "repeat" nipple 34 and co-operate therewith to admit atmospheric pressure to the valve 68 through a conduit 69. When the locking circuit is thus broken, the solenoid 59 is deenergized and the contactor 55 is again grounded through the switch 57 which is closed at that moment. Therefore, if the switch 51a is at "typing" position, then the typing solenoid 31 will be energized to move the clutches to reverse the record from rewind to typing speed forward.

If it is desired to repeat a single paragraph, the switch 57 controlling the writing of that paragraph should be set at "typing" and the next successive switch should be in rewind position.

It is an important object of the invention to provide a selecting means in which the switches 51 or equivalent control may be manipulated as desired to select any paragraph in a record or any series of paragraphs so that the selected paragraphs may be written in any order desired. For example, if it is desired to write paragraphs 1, 10, and 5 consecutively, then switch 51a is set at "typing", all of the switches 51 between the first and tenth are then set at high speed forward, and the tenth switch is set at "typing". After the record is stopped at paragraph 10, the tenth switch is set at rewind and the ninth, eighth, seventh, and sixth are set at rewind and the fifth switch at typing.

A normally closed manually operable vent valve 70 is connected to the inlet of the pneumatic repeat valve 68 so that the lock circuit may be broken to stop the rewind movement of the record at any desired point. Also, a normally open, manually operable, grounded rewind switch 71 is connected to the rewind circuit so that the control device may be short-circuited and the record rewound from any point thereon.

As previously stated, an important object of the present invention is to provide an interlocking typewriter control means whereby a single typewriter may be operated from a record on any selected one of a plurality of automatically controlled record operating mechanisms or "record boxes". All of the record boxes, including the selector controls, may be identical. Therefore, only one has been illustrated and described. However, in Fig. 3 the tracker bars 2 and 2a of two record boxes are diagrammatically illustrated in connection with an automatic impulse transmission for controlling the operation of a single typewriter from a selected one of a plurality of record boxes.

Although the embodiment of Fig. 3 is shown in connection with only two tracker bars and only a single typewriter, it will be apparent that more tracker bars and associated record boxes may be used by the addition of more control elements and a proper connection of the conduits. Also a number of typewriters may be operated simultaneously from any single tracker bar merely by connecting the conduits from the key operating pneumatics in parallel.

The embodiment shown in Fig. 3 comprises a typewriter 72, the keys of which are connected to pneumatics 73 for operation in the usual manner. Each pneumatic is controlled through a secondary pneumatic valve 74, which latter is of the usual type and may be controlled from either tracker bar 2 or 2a through a conduit 75 and branch conduits 76 and 77, respectively. The branch conduits 76 may be connected to the nipples of tracker bar 2 through a multiple port slide valve 78 and the branch conduits 77 may be connected to tracker bar 2a in the same manner through a similar multiple port slide valve 79. The valves each comprise a fixed base plate with an upper valve plate slidably mounted thereon for limited movement as shown, whereby, when either valve plate is moved to the right, the corresponding tracker bar conduits are closed and, when moved to the left, the conduits are opened to enable operation of the typewriter.

The tracker bar 2 is provided with a nipple 36 for co-operation with a perforation 36a in a record. The movable valve plate of slide valve 78 may automatically be moved to the right to prevent operation of the typewriter from tracker bar 2, by means of a pneumatic 80 controlled by a secondary pneumatic valve 81, which latter is controlled from the tracker bar 2 through a conduit 82 connected to the nipple 36. The multiple port slide valve 79 is identical with the valve 78 and is controlled in a like manner from its associated tracker bar 2a by means of a pneumatic 80a and secondary valve 81a connected to the

tracker bar nipple 36b by a conduit 82a, whereby all of the conduits 77 leading to tracker bar 2a may be closed when the valve plate is moved to the right. A similar parallel impulse venting valve is automatically operated by the clutch lever 23, as shown in the upper right-hand corner of Fig. 1, so that, when the clutch lever 23 is in any other than typing" position, the corresponding slide valve 78 will be in "off" position. For this purpose a vent valve 82b is connected to the conduit 82 and operated by the clutch lever 23 by means of a link 82c connected therebetween. By this means, the vent valve 82b will be closed when the clutch lever 23 is in typing position and open whenever the lever is moved to either high speed forward or rewind. A handle 23a is also provided on the clutch lever so that it may be manually operated if desired.

The valve plates 78 and 79 may selectively be moved in the opposite direction to open the associated tracker bar conduits, by means of pneumatics 83 and 84, respectively. Pneumatic 83 is controlled by a secondary pouch valve 85, which latter may be controlled by venting through a conduit 86, nipple port 87 in slide valve 79, conduit 88, and manually operable push button vent 89 shown at the right of Fig. 3. The port 87 in slide valve 79 is so related to the typewriter impulse controlling ports that, when the valve 79 is in the position shown to operate the typewriter from tracker bar 2a, the nipple port 87 is closed and the vent push button 89 is ineffective to control the pneumatic 83 of the slide valve 78. Therefore, when the typewriter is being operated from the tracker bar 2a, it is impossible to position the slide valve 78 to pass impulses from the tracker bar 2.

The pneumatic 84 for moving the slide of the port valve 79 to the left is controlled by a secondary pouch valve 90, which latter may be controlled in a manner similar to the secondary valve 85 by venting through a conduit 91, nipple port 92 in slide valve 78, conduit 93, and manually operable push-button vent 94.

After the records have been properly positioned in the two spool boxes and over their respective tracker bars 2 and 2a and the records have been moved so that the stop perforation 42 is over the corresponding tracker bar nipple opening 37, so that the stop pneumatic 10 (Figs. 1 and 3), is collapsed and the pinion 8 (Fig. 1) is out of mesh with the gear 9, both spool boxes are in so-called "stop" condition and the entire system is in condition to start writing from either record. At this time the upper slides of the nipple valves 78 and 79 are at their extreme right-hand position; that is, the typewriting operating conduits from the tracker bars are all closed and the slide control venting ports 87 and 92 are both open, that is, in position for venting by a "start writing" control push button. Therefore, the operator may start writing from either record by manually operating a corresponding "start writing" push button 89 or 94 as desired.

In the embodiment shown in Fig. 3, the push button 94 has been operated to vent the secondary valve 90 through the valve port 92 of the slide valve 78 and to thereby move the slide valve 79 so that all of the typewriter operating ports are open and the conduits from the tracker bar 2a are in a condition to operate the typewriter therefrom. This movement to the left of the slide valve 79 closes the vent port 87 thereof and therefore makes the manually operable vent valve 89 ineffective so that the slide valve 78 cannot be moved to the left to open the conduits to the tracker bar 2. Therefore, the typewriter can only be operated from the tracker bar 2a until the slide valves 78 and 79 are both again in closed or so-called shut-off position.

It will be apparent that, with the slide valves 78 and 79 both in shut-off position, the typewriter may be operated from the tracker bar 2 instead of the bar 2a, if desired, by operating the "start writing" vent valve 89. This will vent the secondary valve 85 through conduit 88, nipple ports 87, and conduit 86 to thereby collapse the pneumatic 83 and move the valve 87 to the left to connect the typewriter operating conduits to the tracker bar 2, in which position the "start writing" vent button 94 will be made ineffective by the closing of the ports 95 of valve 78 in the same manner as previously described.

When the records are in the so-called "stop" position—that is, when the stop pneumatic 10 (Fig. 1) is collapsed so that the pinion 8 is out of mesh—the record can only be started by venting the lock pouch valve 38 to thereby control the secondary valve 38a and allow the pinion 8 to drop into mesh with the gear 9 and operate the record at a typing rate. In order to vent the lock pouch valve 38 and lower the pinion to start the record, the slide valve 78 is provided with a normally closed venting port 95 which is connected to the lock pouch valve 38 by means of a venting conduit 96. This venting port 95 is also connected to the "start writing" push-button vent 89 through a conduit 97, so that, whenever the "start writing" button 89 is operated to move the slide valve 78 to the left, this movement will connect the venting conduits 96 and 97 and the "stop" lock pouch valve 38 (Fig. 1) will be vented to permit the pinion 8 to mesh with the gear 9 and start movement of the record over the tracker bar 2. In this left-hand position of the valve 78, the venting port 92 will be closed and, therefore, the "start writing" push button 94 of the tracker bar 2a will be made ineffective in the same manner as previously described for the "start writing" button 89.

The slide valve 79 is also provided with a vent port 95a and conduit 96a leading to the "stop" lock pouch valve 38 for controlling the stop pneumatic of the spool box of tracker bar 2a. This is vented in the same manner as previously described, through a conduit 97 leading to the "start writing" push-button vent 94.

By means of the pneumatic and electrical system just described, the operator may select any one of a plurality of records and may print any selected material therefrom and may repeat this selection as desired or may change from time to time to other records.

Fig. 4 illustrates a means for changing the electrical impulses from the selector system shown in Fig. 2 into pneumatic impulses for operating the record controlling clutches 12 and 20 of Fig. 1. In this embodiment, the "rewind", "typing", and "high speed forward" solenoids 25, 31, and 26, respectively (Fig. 1), are eliminated and pneumatics substituted therefor. A pneumatic valve block 98 is provided with a plurality of secondary valves of the character previously described and these valves are connected to a vacuum source in the usual manner, and, through conduits 99, 100, and 101, are connected to pneumatics 99a, 100a, and 101a, respectively. These pneumatics are mechanically connected to the clutch controlling members shown in Fig. 1 in exactly the same manner as the corresponding solenoids

shown therein so that, when any one of the pneumatics is collapsed, a corresponding operation of the clutches will take place. In other words, the "rewind", "typing", and "high speed forward" pneumatics take the place of the corresponding solenoids and, when the respective secondary valves in the valve block 98 are vented by the selector shown in Fig. 2, the record operation will be identical with that previously described.

In order to selectively vent the secondary valves of the valve block 98 by electrical impulses from the selector shown in Fig. 2, solenoids 102, 103, and 104 are connected to the control circuits 54, 53, and 52 and are selectively operated by the electrical impulses from the selector to selectively open vent valves 105, 106, and 107 for venting the secondary valves in the valve block 98 to thereby automatically control the record operating mechanism in the same manner as previously described for the electrical control.

In some of the claims, the well known term "record box" has been used for convenience, and is intended to mean the record operating mechanism disclosed in the drawings or the equivalent.

It is intended, of course, that the invention should not be limited to the specific embodiment or embodiments disclosed herein, since modifications may be made, and it is contemplated, therefore, by the appended claims to cover any such modifications as fall within the true spirit and scope of this invention.

Having thus described this invention, what is claimed and desired to be secured by Letters Patent is:

1. In a typewriter control, a plurality of record boxes having tracker bars for co-operation with record strips, a pneumatic multiple conduit impulse transmission associated with each tracker bar for operating said typewriter, a valve for controlling the conduits from each tracker bar, preselecting means associated with each valve to operate its associated valve to preselect and start operation of its corresponding record box, and means controlled by each preselecting means to simultaneously condition all of the remaining preselecting means so that operation thereof is ineffective to cause impulse transmission through any typing conduits other than those associated with the tracker bar of the selected record box.

2. In a typewriter control, a plurality of record boxes having tracker bars for co-operation with record strips, a pneumatic multiple conduit impulse transmission associated with each tracker bar for operating said typewriter, a valve for controlling the conduits from each tracker bar, preselecting means associated with all of said valves to preselect and start operation of a record box and, simultaneously with said preselection, to make said preselecting means ineffective to cause typing impulse transmission through any of said valves except from the tracker bar of the selected record box, and pneumatic means controlled by the selected record strip to close the corresponding valve at a predetermined point in the movement of said record strip.

3. In an automatic control for a typewriter, a plurality of record boxes, typing impulse transmission from each record box to said typewriter, an impulse blocking means for controlling each typing transmission, selecting means for selective operation of each blocking means to enable impulse transmission therethrough, and means operatively associated with each blocking means and with said selecting means to make said selecting means ineffective for selection except when all typing transmissions are blocked.

4. In a typewriter control, a plurality of record boxes having tracker bars for co-operation with record strips, a pneumatic multiple conduit impulse transmission associated with each tracker bar for operating said typewriter, a valve for controlling the conduits from each tracker bar, preselecting means associated with all of said valves to preselect and start operation of a record box and, simultaneously with said preselection, to make said preselecting means ineffective to cause typing impulse transmission through any of said valves except from the tracker bar of the selected record box, and means controlled by the selected record strip for closing the corresponding valve at a predetermined point in the movement of said record strip.

5. In a typewriter control the combination with a plurality of record boxes, a typewriter, and a normally ineffective impulse transmission for transmitting operative pneumatic impulses from each record box to said typewriter, of a plurality of selectively operable means under control of an operator to preselect a record box and to physically affect pneumatic connections in said transmission to enable impulse transmission from said selected record box to said typewriter, and means controlled by said preselecting means simultaneously with operation thereof to preselect a record box to prevent operation of said typewriter by other than said selected record box, said last means comprising an intercommunicating pneumatic impulse transmission between said plurality of operator-controlled record box selecting means, and automatically selective blocking means in said intercommunicating transmission.

6. In an automatic typewriter control, the combination with a typewriter, two independently operable record boxes with the usual tracker bars and records, and a common pneumatic key operating impulse transmission with a branch transmission for control of said typewriter from either record box, of manually operable means for preselecting and starting a record box and physically affecting pneumatic connections in said transmission to enable impulse transmission from said selected record box to said typewriter, means simultaneously and automatically operable to prevent accidental or other operation of said preselecting means from causing operation of other than the selected record box, and means associated with each record box and controlled by a record to make said selected record box ineffective to operate said typewriter during a predetermined fill-in period of record operation, said last means being interrelated with and controllable by said preselecting means to enable only the same record box to be again started by said preselecting means at the end of one of said predetermined periods.

7. In an automatic typewriter control, the combination with a typewriter, two independently operable record boxes with the usual tracker bars and records, means associated with each record box to change the direction and speed of movement of a record, and a common pneumatic key-operating impulse transmission with a branch transmission for control of said typewriter from either record box, of pneumatic means operable for changing the penumatic connections of said impulse transmission to preselect a record box, means simultaneously operable to make the non-selected record box ineffective to operate said

typewriter, a control for each record box comprising means to preselect a predetermined portion of a record for typing, means automatically controlled by said portion preselecting means to cause high speed operation of said record through nontyping portions and typing speed operation of said record through the selected portion, and pneumatic means controlled by said last means to make said impulse transmission ineffective to operate said typewriter except during typing speed operation of said record.

8. In a typewriter control the combination with a plurality of record boxes, a typewriter, and a normally ineffective impulse transmission for transmitting operative pneumatic impulses from each record box to said typewriter, of a plurality of selectively operable means under control of an operator to preselect a record box and to physically affect pneumatic connections in said transmission to enable impulse transmission from said selected record box to said typewriter, and means controlled by said preselecting means simultaneously with operation thereof to preselect a record box to prevent operation of said typewriter by other than said selected record box, said last means comprising an intercommunicating pneumatic impulse transmission between said plurality of operator-controlled record box selecting means and independent of said typewriter operating transmission, and automatically selective blocking means in said intercommunicating transmission.

9. In a typewriter control, a plurality of record boxes having tracker bars for co-operation with record strips, a pneumatic multiple-conduit impulse transmission associated with each tracker bar for operating said typewriter, a valve for controlling the conduits from each tracker bar, a preselecting means associated with each valve to cause operation thereof to start operation of a selected record box, said preselecting means comprising a second pneumatic impulse transmission independent of the typewriter operating transmission and associated pneumatics for selectively operating said valves, means controlled by the preselected valve to make said preselecting means ineffective for preselection until a predetermined portion of a record strip has been written, and pneumatic means controlled by the selected record strip to operate said valve at a predetermined point in the movement of said record strip to make the typewriter operating conduits ineffective for impulse transmission and to simultaneously make all of said preselecting means effective for preselection.

10. The combination with a typewriter, a plurality of record boxes, and a normally closed multiple-conduit pneumatic impulse transmission between the tracker bar of each record box and said typewriter, said transmission including a multiple-conduit valve associated with each record box for simultaneously opening all of the conduits of a selected record box to said typewriter, of a valve-opening pneumatic associated with each valve, a record-controlled valve-closing pneumatic for closing each valve, a manually operable preselector for controlling each valve-opening pneumatic, and means controlled by each valve to make the preselectors of the remaining valves ineffective after each preselection until the selected valve is closed.

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