

Aug. 9, 1966

R. KOBLER
AUDIO TYPEWRITER

3,264,757

Filed Dec. 3, 1963

2 Sheets-Sheet 1

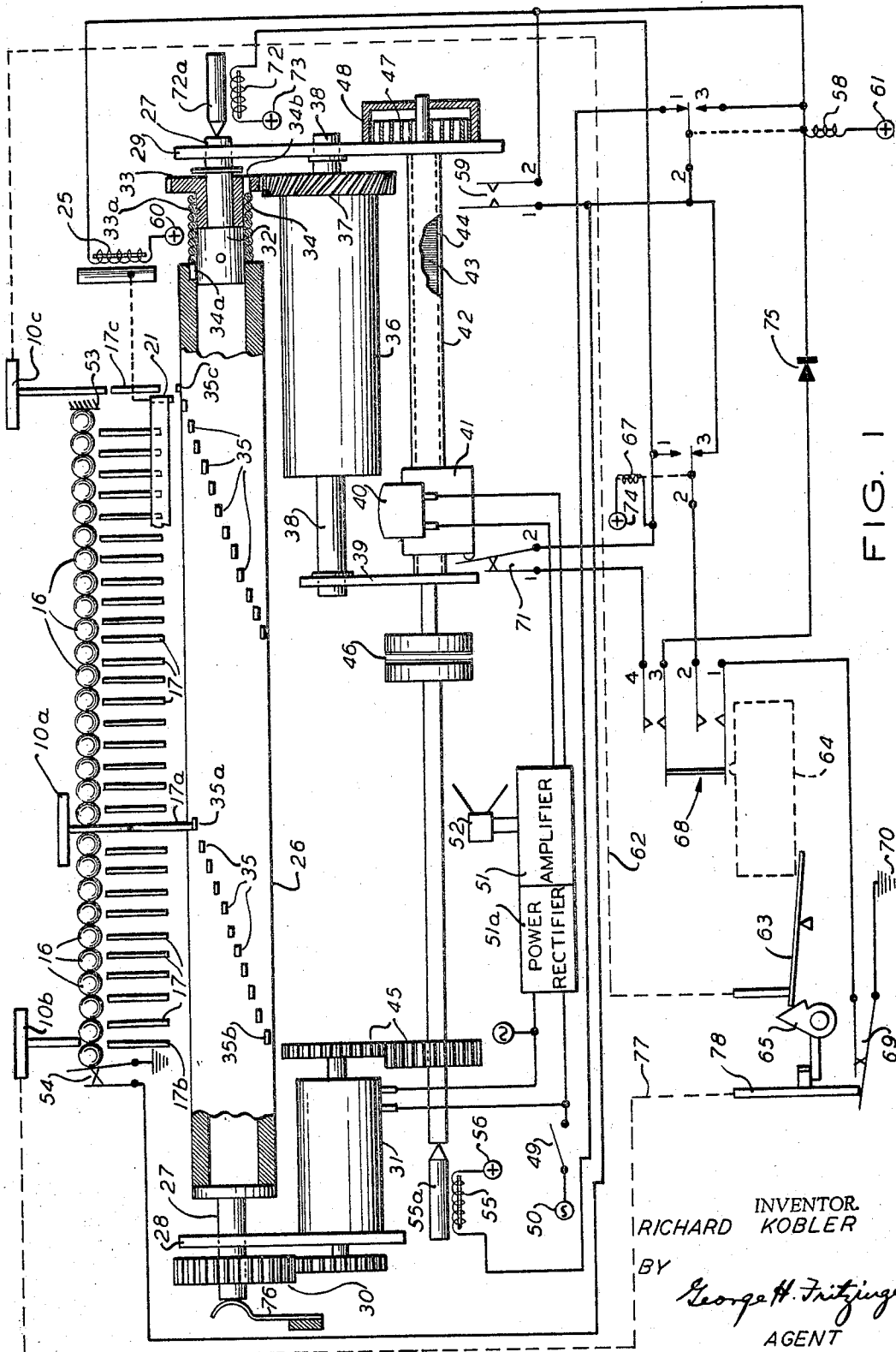


FIG. 1

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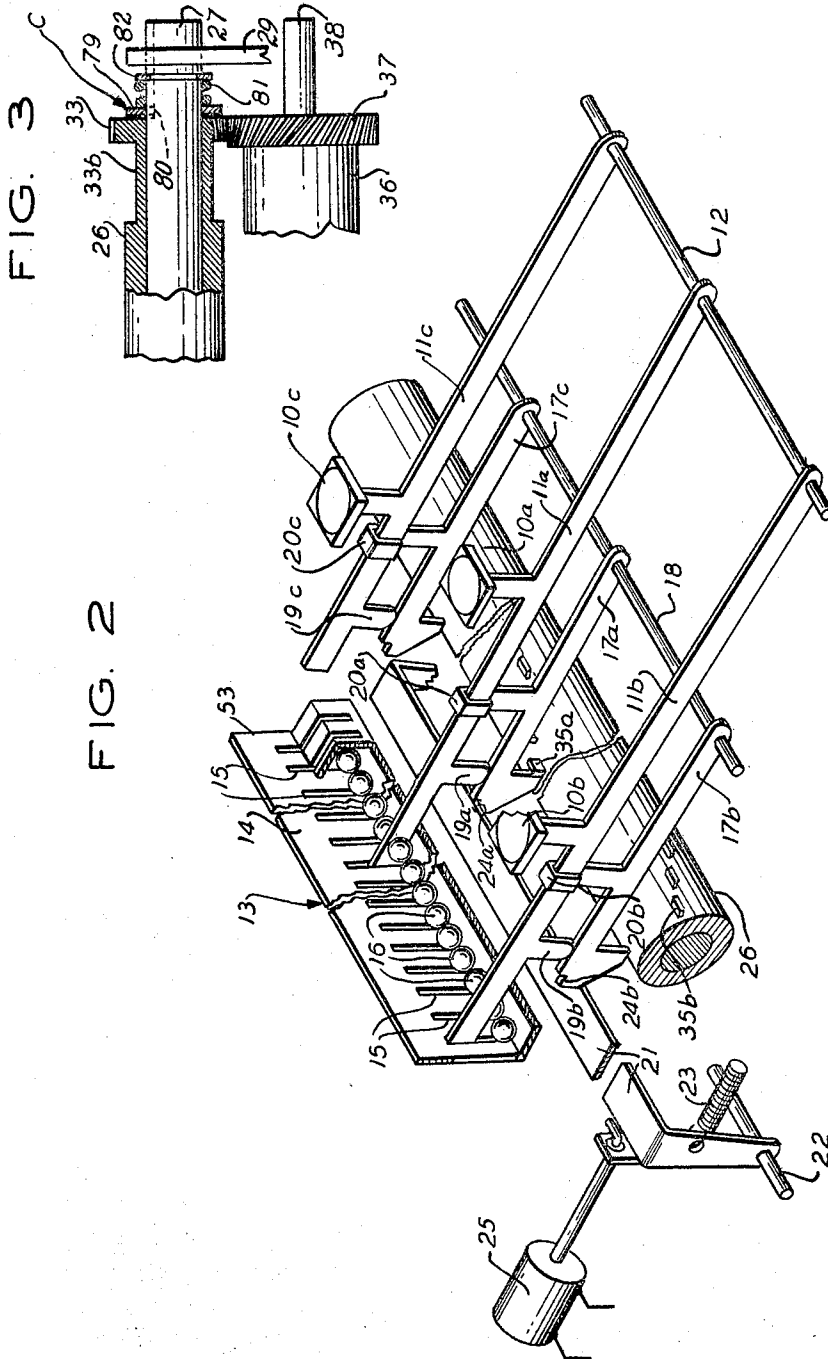
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RICHARD KOBLER INVENTOR

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1

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AUDIO TYPEWRITER

Richard Kobler, West Orange, N.J., assignor to McGraw-Edison Company, Elgin, Ill., a corporation of Delaware
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18 Claims. (Cl. 35—5)

This invention relates to an improved apparatus for making statements to explain or pronounce the characters and control functions designated on the keys of a typewriter as the respective keys are depressed. More particularly, the invention relates to a novel apparatus which can be coupled to a standard typewriter to pronounce each character as the same is typed.

The present audio typewriter is useful especially in the educational field as a self-teaching aid for enabling children at an early age to learn to recognize and pronounce the symbols on the keyboard of a typewriter as well as to learn dexterity in operating a typewriter keyboard. The present audio typewriter may also be incorporated in a more elaborate teaching apparatus such as is disclosed in the pending application of Richard Kobler and Omar K. Moore, Serial No. 185,616, filed April 6, 1962, wherein it is disclosed to exhibit successive items of programmed material to a pupil and at the same time to encode the audio typewriter to pronounce or explain the successive items and to free the typewriter to enable the pupil to type the same.

An object of my invention is to provide a novel mechanism and system for indexing a phonographic apparatus to reproduce selected items of prerecorded information as the respective keys of a keyboard are depressed.

Another object is to provide a novel apparatus for indexing such phonographic apparatus as between lower case and upper case characters on the keys of a typewriter.

A more specific object is to provide a frictionally driven indexing drum having peripherally projecting dogs engageable by respective latches for stopping the drum in respective angular positions as the keys of a typewriter are depressed.

Another object is to drive a phonographic record medium through a spring integrating clutch and to disengage the clutch by the aforesaid indexing drum as respective keys of a typewriter are depressed.

Other objects and features of my invention will be apparent from the following description and the appended claims.

In the description of my invention reference is had to the accompanying drawings, of which:

FIGURE 1 is a diagrammatic view of mechanism and circuits illustrating my invention;

FIGURE 2 is a fractional view of a typewriter keyboard mechanism and of an associated indexing drum for selectively controlling a phonograph apparatus; and

FIGURE 3 is a fractional view illustrating a modification in the indexing apparatus of the audio typewriter.

In the figures several illustrative keys 10a, 10b and 10c of the key board of a typewriter are shown in which the key 10a is considered as a character key for typing lower and upper case characters, the key 10b is a lower case shift key and the key 10c is an upper case shift key. These keys are upstanding from respective key levers 11a, 11b and 11c pivoted on a cross rod 12. When a character key is depressed a respective type bar is actuated against a platen to type the respective character but such apparatus is standard and need not be herein shown. A standard ball-race 13 is provided to permit only one key other than the upper case shift key to be depressed at a time because single key activation is important to the invention. This ball-race comprises a ball-race holder 14 in the

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form of a channel bar having slots 15 through which extend the respective key levers. In the channel bar is a spherical ball or roller 16 for each key lever arranged in a row with an aggregate play or spacing between all of the rollers equal to the width of a single key lever. When any key other than the upper case shift key is depressed the respective key lever is moved between the pair of corresponding rollers to take up the entire play in the ball-race so that no other key associated with the ball-race can be simultaneously depressed.

Further, it is a feature to latch each key as the same is depressed. The latch means for all of the keys other than the upper case shift key 10c includes pawls 17a-17b for the respective key levers 11a-11b which are herein-after referred to as latch pawls because they perform a latching function in connection with the indexing operation abovedescribed. Also, for such indexing function a latch pawl 17c is associated with the upper case shift key lever 10c. These latch pawls are pivoted on a common cross rod 18. The key levers have depending fingers 19a-19c for movement against the respective latch pawls as the key levers are depressed. Also, the latch pawls have upstanding hook-shaped fingers 20a-20c which overlie the respective key levers so that when a latch pawl is locked in a depressed position it will in turn hold the key lever depressed. Such locking of the respective latch pawls except the latch pawl 17c is accomplished by a common bail 21 pivoted on a cross rod 22 and biased by a tension spring 23 against the end faces of the free end portions of the latch pawl. When a latch pawl is depressed by a key lever, the bail 21 is snapped into locking engagement with a respective notch 24a-24b of the latch pawl. Such locking engagement of an individual latch pawl is permitted by reason of the lower portions of the free end faces of the latch pawl's being cut away so that the unoperated latch pawls will not obstruct the movement of the bail into a latching position. When an unlocking solenoid 25—hereinafter referred to as a key release solenoid—is next activated the bail 21 is withdrawn and the depressed key is released.

Extending crosswise of the machine below the series of latch pawls 17 is an indexing drum 26. This drum is journaled on a shaft 27 which is in turn journaled in frame members 28 and 29 at its left and right ends. The shaft is coupled at its left end through gears 30 to a drive motor 31. Pinned to the shaft at the right end of the drum is a collar 32, and journaled on the end portion of the shaft beyond the collar is a gear 33 the hub 33a of which is an even circumferential extension of the collar. Surrounding the collar 32 and hub 33a in frictional engagement therewith is a helical clutch spring 34. One end of this spring has a tail 34a secured to the indexing drum 26 and the other end has a tail 34b secured to the gear 33. The direction of winding of the clutch spring is such that when the indexing drum is held stationary the rotating drive collar 32 will by its frictional contact tend to unwind the clutch spring and uncouple the same to allow the collar to continue to rotate. However, the instant the indexing drum is freed the clutch spring engages the collar by its inherent resilience and is tightened thereon by the resisting work load of the gear 33 to couple the shaft 27 tightly to the gear 33. Thus, the gear 33 stands still when the indexing drum is held stationary, and the gear 33 is turned with the shaft 27 when the indexing drum is free to rotate. When the indexing drum is in a free condition it is rotated releasably with the shaft 27 by the frictional contact of the clutch spring with the drive collar 32.

By the present invention the indexing drum 26 is latched in respective angular positions as the respective keys of the typewriter are depressed. For this purpose the indexing drum 26 has as many peripherally project-

ing dogs 35 as there are typewriter keys. These dogs are spaced along the drum in circumferential alignment with the respective latch pawls 17 and are offset from each other at equal angular intervals about the drum. For instance, a typewriter with fifty keys would call for fifty dogs along the drum spaced at 7.2° intervals about the drum axis. Specific dogs are designated by the numeral 35 with the suffix letter of the corresponding key. Thus, when the key 10a is depressed into a latched position, the latch pawl 17a is held in a position on the indexing drum to stop the drum when the corresponding dog 35a strikes the respective latch pawl. The instant the indexing drum becomes so latched, the spring clutch 34 is uncoupled from the drive collar 32 in the manner above-described.

The indexing drum 26 is coupled to a record drum 36 through a 1:1 ratio gearing including a gear 37 on one end of the record drum meshing with the gear 33. The record drum has a shaft 38 journaled at its ends in the frame plates 29 and 39. The record drum is provided with a magnetic recording surface bearing as many equally spaced parallel tracks lengthwise of the drum as there are symbols to be typed and functions to be performed by the keys of the typewriter. A record-reproduce head 40 is mounted on a carriage 41 for scanning the respective tracks. This head carriage is mounted on a tubular support rod 42 supported in parallel relation to the record drum by the frame members 29 and 39. A feed screw 43 extends axially through the support rod 42 and is journaled at its ends in the frame members 29 and 39. On the carriage 41 is a feed nut (not shown) which extends through a longitudinal slot 44 in the tubular support rod 42 to engage the feed screw. The feed screw is driven by the drive motor 31 through gearing 45 and a friction clutch 46 to advance the head 40 from left to right along the record drum. As the feed screw is so driven it winds up a torsion spring 47 connected between the feed screw and a case 48 mounted on the frame member 29. Upon disengaging the clutch 46 after the head 40 has been advanced along the length of the record drum the torsion spring rotates the feed screw in a reverse direction to return the head to its home position.

When the machine is to be placed in operation, an on-off master switch 49 is closed to connect an A.C. power supply 50 to the drive motor 31 and to a power rectifier 51a for an audio amplifier 51. The amplifier has an input circuit connected to the head 40 and an output circuit connected as to a speaker 52. The drive motor runs continuously and rotates the indexing drum 26 and record drum 36 typically at a speed of 300 r.p.m. When a key, say the key 10a is depressed, it latches the pawl 17a in a depressed position to stop the indexing drum the instant the respective dog 35a comes into abutment thereagainst. At the same instant the indexing drum is stopped the record drum 36 is also stopped to place the track corresponding to the lower case symbol on the key 10a in scanning registration with the gap of the record-reproduce head 40. Also, as the key 10a is depressed the key lever 11a spreads the ball-race 13 from a fixed wall 53 at the right end thereof to close a common key switch 54 at the left end of the ball-race. Closure of the common key switch 54 activates a solenoid 55 for the clutch 46 from a plus terminal 56 through contacts 1-2 of a key release relay 58 and the common key switch 54 to ground. Operation of the clutch solenoid 55 propels a plunger 55a to engage the clutch 46 and start an advance movement of the head 40 along the record drum. Since the index drum 26 could turn through nearly a whole revolution before it is stopped by a latch pawl, nearly 200 milliseconds could elapse when the index drum is turning at 300 r.p.m. before the indexing of the record drum would take place. For this reason the home position of the head 40 is spaced 200 milliseconds in travel time from the left end of the record drum to as-

sure that the record drum is indexed to the position wherein the track corresponding to the symbol being typed is in line with the head 40 before the head begins its scan movement.

When the head 40 has been advanced along the length of the record drum 36 the head carriage moves against an end switch 59 to close the same. Since the depressed key is still latched when the end switch 59 is closed the common key switch is also then still closed. Closure of the end switch activates the key release solenoid 25 from a plus terminal 60 through the end switch 59 and the common key switch 54 to ground. Operation of the key release solenoid 25 disengages the locking bail 21 to release the depressed key 10a so that it can snap back to an unoperated position. After the released key lever has moved out of the ball-race the common key switch 54 is opened to drop out the clutch solenoid 55. It is desirable that the closure of the end switch 59 will not immediately drop out the clutch solenoid 55 else the head carriage would immediately start back home, the end switch would reopen in response thereto and a repeat advance of the head would occur along the same track particularly if the pupil continues to hold the depressed key down to keep the common key switch 54 closed. Also, it is desirable that the key release solenoid 25 be activated before the clutch solenoid 55 is dropped and the end switch 59 is opened to assure that the depressed key will be unlatched. For these reasons the key release relay 58 is connected so that it is activated the instant the end switch 59 is closed from a plus terminal 61 through the end switch 59 and common key switch 54. Operation of this key release relay breaks its switch contacts 1-2 to drop out the clutch solenoid 55 and start the return of the head carriage to home position, and it closes its switch contacts 2-3 to shunt the end switch 59 and maintain an activating circuit for the key release solenoid 25 through the common key switch 54 and to provide a holding circuit for the key release relay 58 after the end switch 59 is opened. Thus, both the key release solenoid and key release relay are locked in until the depressed key has been moved out of the ball-race to open the common key switch. When the depressed key is so released the drive clutch 46 will therefore have already been disengaged to assure that no repeat operation of the drive mechanism for the head carriage will take place along the same track. When the common key switch 54 is opened responsive to releasing the key both the key release relay and key release solenoid are dropped to return the machine to the condition it had before the key was depressed.

The operation so far described is that of typing and pronouncing the lower case characters or symbols on the keys of the typewriter. When it is desired to type and pronounce an upper case character the typewriter is shifted first to an upper case condition by pressing the upper case shift key 10c. This key differs from all others in that it is not in the ball-race 13 nor is it latched by the common bail 21. Instead, the upper case shift key has a mechanical coupling 62 (diagrammatically indicated) to a rocker 63 which is tilted as the key is depressed to lift the type basket 64 to an upper case position. Upon the upper case shift key having been so depressed it is locked by a latch member 65. However, as with the other keys, the depression of the upper case shift key 10c depresses the respective latch pawl 17c against the indexing drum 26 to stop the drum when the corresponding dog 35c comes into abutment therewith. The record drum 36 is thus also stopped in a corresponding position wherein a track thereon which is prerecorded with the pronunciation of "upper case" is brought in registration with the head 40. An activation of the clutch solenoid 55 responsive to depressing the upper case shift key 10c now also takes place from the plus terminal 56 through the switch contacts 1-2 of the key release relay 58, switch contacts 2-3 of an upper case shift relay 67,

contacts 1-2 of a type basket switch 68 and a lower case key switch 69 to ground 70. The advance movement of the head 40 is therefore started to cause the head to scan the upper case track on the record drum 36 to pronounce "upper case."

When the head 40 has reached the end of its scan movement it again closes the end switch 59 to activate both the key release solenoid 25 (now without effect) and the key release relay 58 from their respective plus terminals 60 and 61 through the end switch 59, switch contacts 2-3 of the upper case shift relay 67, contacts 1-2 of basket switch 68, lower case shift switch 69 and ground 70. Activation of the key release solenoid 25 is now without effect because the key 10c is outside the latching bail 21. Operation of the key release relay 58 opens its switch contacts 1-2 to drop out the clutch solenoid 55 and start return of the head 40, and it closes its contacts 2-3 to shunt the end switch 59 so that the key release solenoid 25 and key release relay 58 will stay operated during return of the head. When the head 40 reaches home position it closes a home switch 71 to activate an upper case shift solenoid 72 from a plus terminal 73 and the upper case shift relay 67 from plus terminal 74, both by way of the home switch 71, contacts 3-4 of the basket switch 68, diode 75, switch contacts 2-3 of the key release relay 58, switch contacts 2-3 of the upper case shift relay 67, contacts 1-2 of basket switch 68 and lower case shift switch 69 to ground 70. The activation of the upper case shift relay 67 opens its switch contacts 2-3 to drop out both the key release solenoid 25 and key release relay 58, and it opens the initial energizing circuit for the upper case shift relay 67 and upper case shift solenoid 72 but without effect because this relay and solenoid are now held operated by a circuit running through switch contacts 1-2 of the upper case shift relay 67, contacts 1-2 of basket switch 68, lower case shift switch 69 and ground 70. Moreover, this hold circuit is maintained so long as the typewriter is left in upper case condition. The hold circuit is not however carried through to the key release relay 58 because of the diode 75.

The activation of the upper case shift solenoid 72 propels its armature 72a in a leftward direction against the shaft 27 of the index drum 26 to shift the drum a distance of one-half the width of the respective dogs 35 except the dog 35c corresponding to the upper case shift key 10c as to which the shift is equal to the full width of the dog. As shown in FIGURE 1, the latch pawls 17 are lined circumferentially of the drum with the left half portions of the respective dogs 35 except the dog 35c. As to the dog 35c the latch pawl is in direct alignment therewith circumferentially of the drum throughout the width of the dog when the indexing drum 26 is in its right hand or lower case position defined by pressure of a spring 76 against the left end of the shaft. When the index drum 26 is shifted leftwardly to its upper case position by activation of the upper case shift solenoid 72, the latch pawls 17 except the pawl 17c are aligned circumferentially with the right half portions of the respective dogs to have the same functional relationship in indexing the drum as before but the latch pawl 17c corresponding to the upper case shift key is now totally out of alignment with the respective dog 35c to permit the index drum to rotate notwithstanding that the upper case shift key is still latched in its operated position.

Further, the leftward axial shifting of the index drum 26 produces a rotational shift in the record drum 36 by half the distance between the successive lower case tracks on the latter. This is accomplished by making the gears 33 and 37 of the helical type. Thus, a set of upper case tracks is provided on the record drum sandwiched between the successive lower case tracks. The odd numbered tracks on the record drum may be referred to as the lower case tracks and the even numbered as the upper case tracks. Although the index drum 26 is still indexed

in the same angular positions by the respective keys when the machine is in upper case condition, the record drum is indexed in alignment with the respective upper case or even-numbered tracks because of the shift which has taken place between the index and record drums.

The operation of the machine responsive to pressing a key while the machine is in upper case condition is the same as before described when the machine was in lower case condition except that now the head 40 will scan a respective one of the upper case tracks. For example, upon pressing the key 10a when the machine is in upper case condition, the index drum is stopped in the same position as before and the record drum is stopped in its corresponding upper case position. Further, the common key switch is closed to activate the clutch solenoid 55 via the contacts 1-2 of the key release relay 58 to start the scan operation and cause the machine to pronounce the upper case symbol on the key 10a. When the head reaches the end of its travel and closes the end switch 59 both the key release solenoid 25 and key release relay 58 are operated via the end switch 59 and the common key switch 54. Operation of the key release relay 58 drops out the clutch solenoid 55 to start return of the head to home position and simultaneously provides a short circuit around the end switch 59 to retain the release solenoid 25 and release relay 58 operated during the head return. The instant the key 10a is returned to unoperated position the common key switch 54 is opened to drop both the key release solenoid 25 and key release relay 58. The machine is therefore returned to the condition it had before the key 10a was depressed.

In summarizing the upper case operation starting with the depressing of the upper case shift key 10c, the typewriter is shifted into upper case condition and the machine pronounces "upper case" while the reproduce mechanism is still in lower case condition but at the end of the pronunciation the reproduce mechanism is shifted to upper case condition and locked automatically therein, and further, so long as the machine is locked in upper case condition the following conditions are retained: (1) the type basket switch 68 is held closed, (2) the upper case shift relay 67 is held activated by its hold circuit, and (3) the upper case shift solenoid is held activated by its hold circuit.

Since the contacts 2-3 of the upper case shift relay 67 are now open and the diode 75 prevents locking ground for the upper case shift relay from reaching the key release relay 58, the only ground connection that can now be completed to start an operational cycle is the one through the common key switch 54. Once this common key switch is closed by depressing a key associated with the ball-race 13 the subsequent closure of the end switch 59 produces the same results as are described above under the lower case operation. The only mechanical difference is that the index drum 26 remains shifted to the left so that the record drum 36 will be indexed to the respective upper case tracks and so that the dog 35c of the upper case shift key will be out of alignment with the respect to the latch pawl 17c.

Should the upper case shift key 10c be depressed and then another key depressed before the pronunciation of "upper case" is completed, only the first operational cycle pronouncing "upper case" will take place. For example, upon having pressed the upper case shift key 10c into a latched position, the basket switch contacts 1-2 and 3-4 will be closed, the index drum will be in its lower case position latched by the pawl 17c of the upper case shift key and the head 40 will be scanning the lower case track prerecorded with the pronunciation of "upper case." Also, the key next pressed will be held latched by the bail 21 and the common key switch 54 will be closed. As the head closes the end switch 59 after pronouncing "upper case," the key release solenoid 25 and key release relay 58 will be activated through the end switch 59 and

cause the depressed subsequent key to be unlatched to open the common key switch.

When the lower case shift key 10b is pressed the rocker 63 in unlatched by a coupling 77 to a plunger 78 operating against the latch 65 causing the basket 64 to return to lower case position, the lower case switch 69 to be opened and the common key switch 54 to be closed. However, in order that the upper case shift relay 67 and the upper case shift solenoid 72 will be dropped responsive to pressing the lower case shift key, the switches 69 and 64 are timed so that the lower case switch 69 will be opened before the common key switch 54 is closed. The dropping of the upper case shift solenoid returns the index drum 26 to its rightward lower-case position and shifts the record drum 36 relative to the index drum for lower case operation. The stopping of rotation of the index drum 26 and resultant indexing of the record drum 36 together with the engagement of the drive clutch 46 causes the machine to pronounce "lower case" from the respective lower case track in the normal way.

If the user presses the upper case shift key 10c while the machine is pronouncing "lower case" nothing happens because the upper case shift key will not latch until the lower case shift key 10b is unlatched, and the home switch 71 is now open to prevent the pressing of the upper case shift key from operating the upper case shift relay 67 and the upper case shift solenoid 72.

If the machine has completed pronouncing "lower case" and the end switch is operated to activate the key release solenoid 25 and the key release relay 58 over the end switch 59 and the common key switch 54, the activation of the key release relay 58 breaks the contacts 1-2 to drop the clutch solenoid 55 to start snap back of the head to home position and the activation of the key release solenoid unlatches the lower case shift key 10b. If the operator presses the upper case shift key during the snap back of the head to home position the upper case shift key is latched as soon as the lower case shift key is unlatched and the key release solenoid 25 and key release relay 58 will remain activated until the head reaches home position over contacts 2-3 of upper case shift relay 67, contacts 1-2 of the basket switch 68 and the lower case shift switch 69. When the head reaches home position to close the home switch 71, the upper case shift relay 67 and upper case shift solenoid 72 are operated over the home switch 71, contacts 3-4 of the basket switch 68, diode 75, contacts 2-3 of the key release relay 58, contacts 2-3 of the upper case shift relay 67, contacts 1-2 of the basket switch 68 and the lower case shift switch 69. Operation of the upper case shift relay 67 provides it and the upper case shift solenoid 72 with a hold circuit over contacts 1-2 of the upper case shift relay 67, contacts 1-2 of the basket switch 68 and the lower case shift switch 69, and it drops the key release relay 58 and key release solenoid 25 by opening contacts 2-3 of the upper case shift relay 67. The machine is therefore now in upper case condition for normal upper case operation.

In the modification shown in FIGURE 3, the gear 33 is secured rigidly to the indexing drum 26 by the sleeve or hub 33b, and a friction slip clutch C is interposed between the shaft 27 and the end face of the gear 33. This clutch comprises a friction disk 79 splined at 80 to the shaft 27 and pressed against the end face of the gear 33 by compression spring 81 backed by a retainer ring 82 in the shaft. The clutch C frictionally drives the indexing drum 26 and record drum 36 but slips continuously whenever the indexing drum is latched.

The embodiment of my invention herein particularly shown and described is intended to be illustrative and not necessarily limitative of my invention since the same is subject to changes and modifications without departure from the scope of my invention, while I endeavor to express according to the following claims.

I claim:

1. In combination, a typewriter keyboard including a set of depressible keys, a rotatably mounted indexing member having projecting dogs spaced along and around the indexing member, a series of latch pawls respectively operable by said keys for engaging said respective dogs to latch said indexing member in predetermined angular positions as respective keys of said keyboard are depressed, a motor driven shaft, a helical spring clutch frictionally engaging said shaft and connected at one end to said indexing member for releasably driving said indexing member, a cylindrical record carrier journaled for rotational movement, and means coupling the other end of said spring clutch to said record carrier for retaining said record carrier in a fixed rotational relationship to said indexing member, said spring clutch being wound in a direction on said motor shaft to cause the spring clutch to be uncoupled from said motor shaft when a key is depressed to latch said indexing member.

2. The combination set forth in claim 1 including a record medium mounted on said record carrier, a reproducer head mounted for movement in a fixed line of travel along said record medium, head driving means activated by depressing a key of said keyboard for moving said head while said record carrier is at standstill to cause said head to scan a track on the record medium corresponding to the depressed key, said tracks bearing pre-recorded statements relating to the symbols on the respective keys of said keyboard.

3. The combination set forth in claim 2 including means for latching each key of said keyboard when a key is depressed, and means responsive to said reproducer head being moved to an end position of the corresponding track for releasing said key latching means.

4. The combination set forth in claim 3 including means responsive to said reproducer head reaching said end position for uncoupling said head from its drive means and returning the head to its start position.

5. In combination, a typewriter keyboard including a set of depressible keys with characters designated thereon, an indexing drum having a series of peripherally projecting dogs spaced along and around the drum, a motor, means including a one-way spring clutch for frictionally coupling said indexing drum to said motor while allowing the drum to be latched in any position, a series of latch pawls operable respectively by said keys as the keys are depressed for engaging said respective dogs to stop said indexing drum in different angular positions, means to latch a key of said keyboard when the same is depressed, and timing means responsive to each latching of a key of said keyboard for releasing the latch key after a predetermined time interval.

6. In combination, a typewriter keyboard including a set of depressible keys with characters designated thereon, an indexing drum having a series of peripherally projecting dogs spaced along and around the drum, a motor, means including a one-way spring clutch for frictionally coupling said indexing drum to said motor while allowing the drum to be latched in any position, a series of latch pawls operable respectively by said keys as the keys are depressed for engaging said respective dogs to stop said indexing drum in different angular positions, a rotatable record carrier coupled to said indexing drum, a record medium mounted on said record carrier having a separate track for each key of said keyboard prerecorded with a pronunciation or statement relating to the character on the respective key, a reproducer head mounted for movement across said record medium to scan said tracks respectively while the record carrier is at standstill, and means for driving said reproducer head responsive to each key depression for causing the head to scan a respective track of said record medium to make a pronunciation or statement relating to the character on the depressed key.

7. The combination set forth in claim 6, including a feed screw for driving said head across said record medium, a friction clutch for coupling said drive means to said feed screw, means responsive to said head reaching the end of its forward travel for disengaging said clutch, and a torsion spring coupled to said feed screw for returning said head to its start position when said clutch is disengaged.

8. The combination set forth in claim 6 including a ball-race and members operable by said keys between the respective pairs of the balls of said ball-race to permit only one key to be depressed at a time, and a common key switch operable by the sidewise shifting of the end ball of said ball-race when a key is depressed for starting the drive means for said reproducer.

9. In combination, a typewriter keyboard including a set of character keys with lower and upper case characters thereon and including lower case and upper case shift keys with means to latch the upper case shift key in operated position when the same is depressed, a frictionally driven indexing drum having peripheral dogs spaced along and around the drum, latch pawls operable by said keys respectively for engaging said respective dogs and latching said indexing drum in different angular positions as different keys are depressed, a rotatable record carrier coupled to said indexing drum to assume a different position for each key depressed, said record carrier having a track for each lower and upper case character on said keys and for said lower and upper case shift keys prerecorded with pronunciation or statements relating to the respective characters or functions, a reproducer head, means for moving said head in scanning relation to the respective tracks when a key is depressed to reproduce the corresponding statement or pronunciation, and means responsive to press said upper case shift key into a latched position for starting said head moving means to scan the corresponding track on the record medium and for thereupon unlatching said indexing drum from said upper case shift key while leaving the upper case shift key in a depressed latched position.

10. The combination set forth in claim 9, including a ball-race and members operable by said character keys and said lower case shift key but not by said upper case shift key for movement between respective pairs of the balls of said ball-race when a key other than said upper case shift key is depressed to enable only one of said keys exclusive of said upper case shift key to be depressed at a time, and a common key switch operable by said ball-race when a character or lower case shift key is depressed for starting said head moving means.

11. The combination set forth in claim 9, including a common means for latching said respective keys other than said upper case shift key, the successive different angular positions in which said record carrier is indexed by said indexing drum being by an angular interval placing successive alternate tracks in registration with said head, and means responsive to pressing said upper case shift key into latched position for shifting said record carrier relative to said indexing drum by one-half said angular interval whereby the intermediate alternate tracks on said record carrier are registered selectively with said head when the respective character keys are depressed while the upper case shift key is latched.

12. The combination set forth in claim 9 including means responsive to said head reaching the end of the track corresponding to said upper case shift key for returning the head to start position and for shifting and holding said indexing drum in a longitudinally displaced position to disengage the dog on said indexing drum from the respective latch corresponding to said upper case shift key, all other dogs of said indexing drum being of a width greater than that of the dog corresponding to said upper case shift key to maintain registration of said other dogs with the respective latch pawls while the indexing drum is maintained in its longitudinally shifted position.

13. The combination set forth in claim 12 wherein alternate tracks on said record medium are prerecorded with the lower case characters and with lower and upper case shift functions, and the intermediate alternate tracks on said record medium are prerecorded with the upper case characters on said respective keys, including means operable as said indexing drum is shifted into said longitudinally displaced position for rotatably shifting said record carrier relative to said indexing drum by the peripheral distance between two successive tracks whereby upon pressing any one of said character keys while the upper case shift key is latched in a depressed position the record carrier is indexed to bring a corresponding one of said intermediate alternate prerecorded tracks into registration with said reproducer head.

14. In combination, a typewriter keyboard including a set of depressible keys, a rotatably mounted indexing member having projecting dogs spaced along and around the indexing member, a series of latch pawls respectively operable by said keys for engaging said respective dogs to latch said indexing member in predetermined angular positions as respective keys of said keyboard are depressed, a motor driven shaft, a friction slip clutch between said motor driven shaft and said indexing member for releasably driving the indexing member, and a movably mounted record carrier having a fixed drive coupling with said indexing member to cause the record carrier to be moved when said indexing member is rotated, said friction slip clutch being adapted to slip during rotation of said motor driven shaft when said indexing member is latched.

15. In combination, a typewriter keyboard including a set of depressible keys having characters designated thereon, means for latching a key of said keyboard when a key is depressed, a common key switch operable by each depression of a key of said keyboard, a record carrier and a record medium thereon having a separate track for each key of said keyboard prerecorded with the pronunciation of the respective character, a reproducer head mounted for movement across said record medium to scan said respective tracks, means responsive to each key depression for indexing said record carrier to bring the track corresponding to the character on the depressed key into registration with said reproducer head, drive means including a clutch solenoid activated by said common key switch for starting an advance movement of said reproducer head when a key is depressed, means for returning said head to home position when said clutch solenoid is dropped, an end switch operable by said reproducer head when the head reaches an end of a track, a relay operable by said end switch via said common key switch for dropping said clutch solenoid and for unlatching said key latching means, and a hold circuit for said relay activated via said common key switch when the relay is operated for maintaining the relay in operated condition until said common key switch is restored to unoperated position.

16. In combination, a typewriter keyboard including a set of depressible keys with characters designated thereon and an upper case shift key, common latching means for latching each character key when the same is depressed, separate latching means for said upper case shift key, phonographic means including a record medium having a track for each of the characters on said keys and for said upper case shift key, means responsive to depressing each key for indexing said phonographic means for reproducing the track corresponding to the depressed key, a common key switch operable by depressing a character key for starting said phonographic means, a basket switch operable by depressing said upper case shift key into a latched operated position for shunting said common key switch to start said phonographic means, and means responsive to said phonographic means being restored to home position after reproducing the track corresponding to said upper case shift key for removing the shunt connection of said basket switch from said common key

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switch so long as said upper case shift key is in a latched operated position.

17. The combination set forth in claim 16, including a second basket switch operable by depressing said upper case shift key into a latched operated position and means operable via said second basket switch when said phonographic means has returned to home position after reproducing the track corresponding to said upper case shift key for shifting the indexing relationship between said character keys and said phonographic means to cause the phonographic means to reproduce respective upper case tracks on said record medium upon the respective character keys being depressed while said upper case shift key is in latched operated position.

18. The combination set forth in claim 17, including

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a lower case shift key operable to unlatch said upper case shift key and return said basket switches to unoperated position and said indexing apparatus to lower case condition, and means connected to said lower case shift key for operating said common key switch when the lower case shift key is depressed.

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