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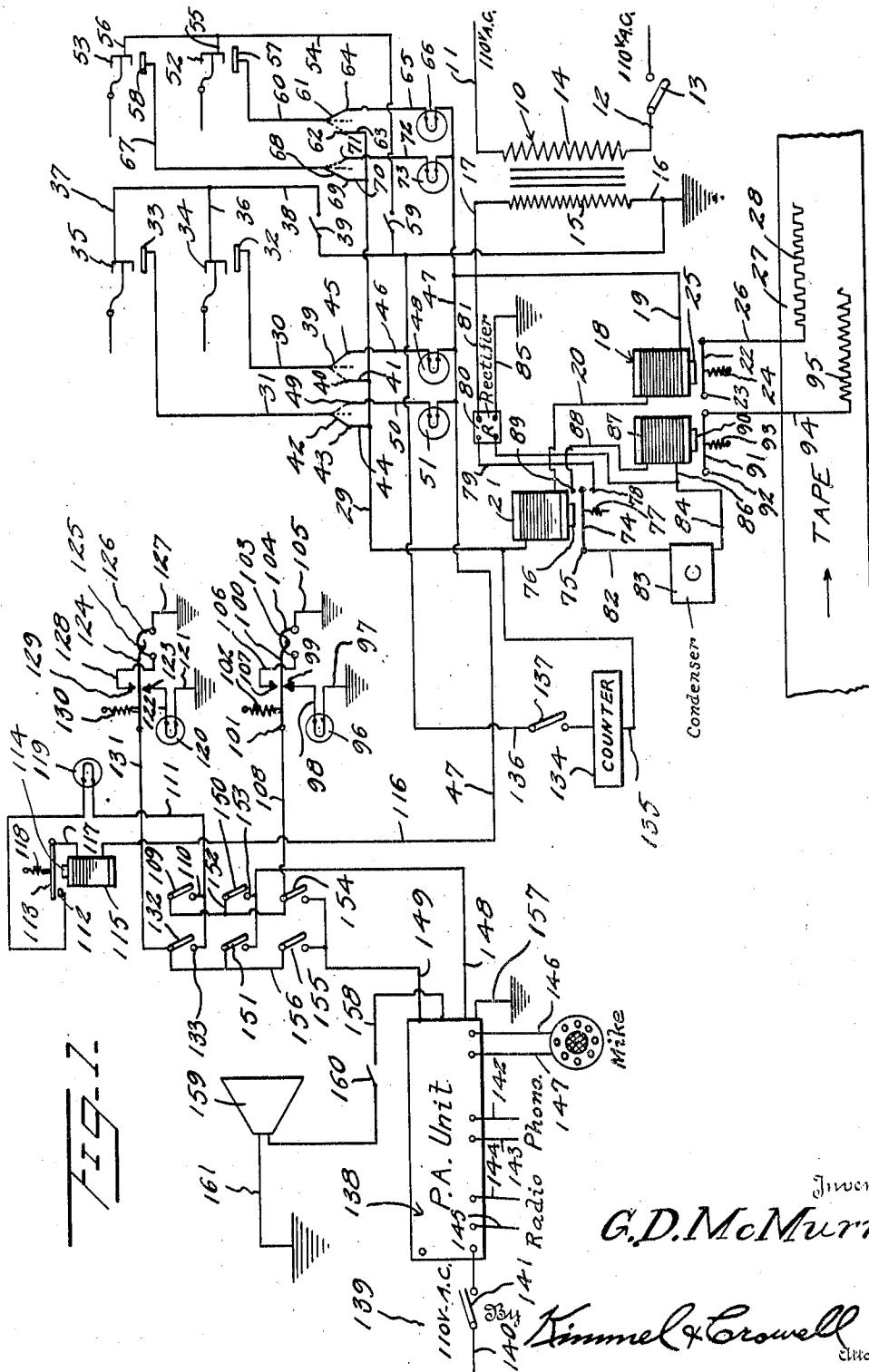
G. D. McMURRY

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TYPING RHYTHM INDICATOR

Filed June 18, 1942

2 Sheets-Sheet 1



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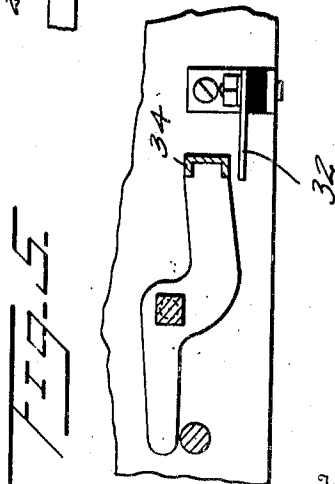
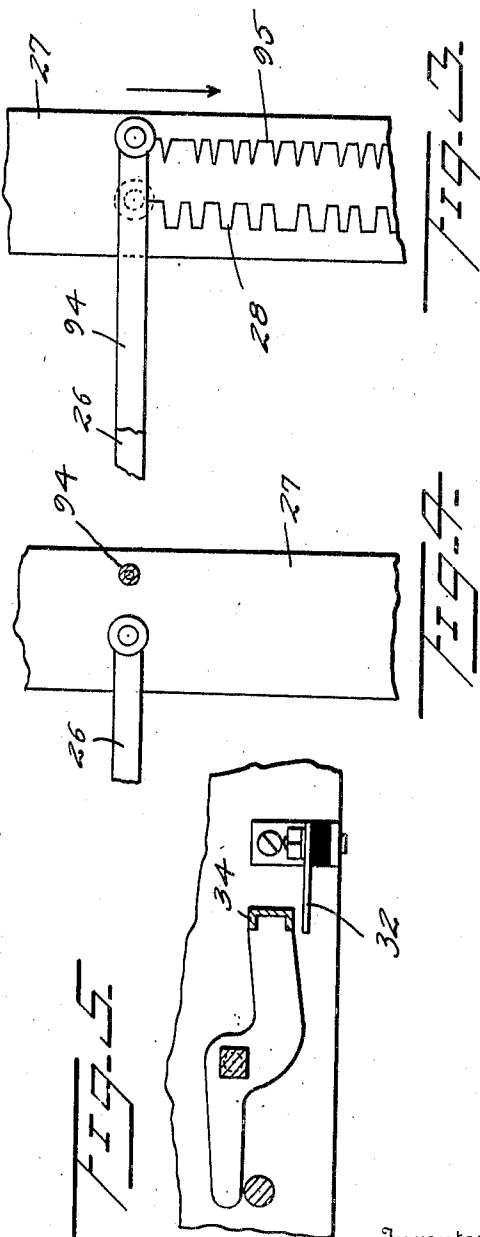
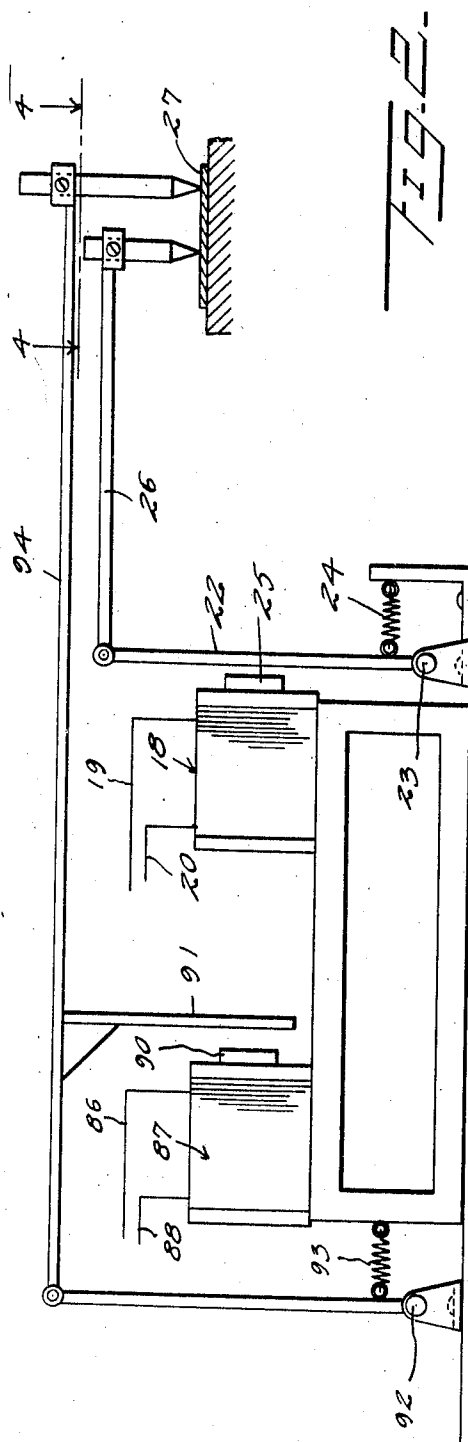
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TYPING RHYTHM INDICATOR

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TYPING RHYTHM INDICATOR

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Application June 18, 1942, Serial No. 447,567

1 Claim. (Cl. 234—1.5)

This invention relates to a typing rhythm producing and recording system.

In the teaching of typing it has been found desirable that the operator or typist be provided with a predetermined rhythm which may be produced from a phonograph record and which will serve as a beat note for the typist so that the typist may follow such rhythm.

Another object of this invention is to provide in combination with a typewriter or one or more series of typewriters, a recording mechanism which is so constructed and arranged that the instructor will be able by glancing at the record strip to determine the fault of a particular student who is not typing at the desired speed or is not typing with the desired even strokes.

A further object of this invention is to provide a system of this kind which includes means whereby selected typists may be connected with the rhythm producing means, and also optionally connected with the recording apparatus to the exclusion of the other typewriters, and if desired the connection of a particular typewriter with the recording apparatus may be made independent of the rhythm producing means and with or without the knowledge of the typist.

A further object of this invention is to provide a system of this kind which not only provides a visible and permanent recording of the typewriter operation, but also provides a counting mechanism for accumulating the strokes of the typewriter so that the speed of the typist can be easily and quickly determined and any fault in rhythmic operation can be detected.

A further object of this invention is to provide in combination with a system of this kind, an improved relay structure which is connected with a recording means, and which, in operation, will record every stroke of the typewriter keys, and at the same time will record the pauses between each stroke in addition to recording the evenness of each stroke. In other words one portion of the relay structure will effect a visible recording of each complete stroke and the time elapsing between the operation or depression of each typewriter key, whereas, another portion of the relay structure will at the same time effect a recording of the actual stroke and thereby show by a visible recording the time which elapses for the completion of each stroke. In this manner it can be determined whether the pause or delay in each stroke is effected between strokes or in a particular part of a stroke.

Another object of this invention is to provide a rhythm producing means which includes a public

address apparatus which may be selectively connected with a loudspeaker or with headphones, at each typewriter, so that either the entire group of students may receive the rhythm from the loudspeaker, or selected students may receive the rhythm. During the time that the rhythm is being produced for the entire group of students any selected typewriter may be placed in circuit with the recording apparatus with or without the knowledge of the typist so that the instructor can determine by a visible recording the progress being made by a selected student.

To the foregoing objects, and others which may hereinafter more fully appear, the invention consists of the novel construction, combination and arrangement of parts, as will be more specifically referred to and illustrated in the accompanying drawings, but it is to be understood that changes, variations, and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a diagrammatic view of a typing rhythm system constructed according to an improvement of this invention.

Figure 2 is a detail side elevation of the recording mechanism.

Figure 3 is a detail plan view of the record sheet engaged with the styli.

Figure 4 is a sectional view taken on the line 4—4 of Figure 2.

Figure 5 is a fragmentary sectional view of the universal bar incorporated with a typewriter and correlated with the recording mechanism.

Referring to the drawings, the numeral 10 designates generally a step-down transformer which is adapted to be connected by means of conductors 11 and 12 to a source of electric current supply, and a manually operable switch 13 is interposed in the conductor 12. The transformer 10 includes a primary coil 14 which is connected to the conductors 11 and 12 and also includes a secondary coil 15 which is inductively related with the primary coil 14. One side of the secondary coil 15 may be connected, as by a conductor 16, to a ground or common conductor and the other side of the secondary coil 15 has connected therewith, a conductor 17. A relay, generally designated as 18, has one side thereof connected, as by a conductor 19, to the conductor 17 and the other side of the relay 18 is connected, as by a conductor 20, to a second relay 21. The relay 18, upon energization thereof, is adapted to operate a pivoted armature 22 which is mounted at one end on a pivot member 23. A spring 24 is con-

nected at one end to the armature 22 and is adapted to constantly urge the armature 22 away from the core 25 of the relay 18. The armature 22 has pivotally connected to the opposite end thereof, a stylus 26 which is disposed in contact-
 ing relation with a recording tape or paper strip 27. The strip 27 is preferably operated at a pre-determined continuous rate and the marking or indication 28, is formed on the tape 27 by the stylus 26, upon movement of the stylus 26, coincident with the movement of the armature 22.

The relay 21 has connected to the opposite side thereof a conductor 29 and the conductor 29 is connected by means of conductors 30 and 31 to contacts 32 and 33. The contacts 32 and 33 each form one side of a typewriter operated switch structure and the other side of the typewriter operated switch structure is formed by the universal bar 34 which forms a part of a conventional typewriter and which is rocked vertically at each stroke or operation of a typewriter key. The contact 33 has associated therewith a universal bar 35 and the two universal bars 34 and 35 are connected by means of conductors 36 and 37 to a common ground conductor 38 having a manually operable switch 39 interposed therein. The conductor 38 is connected at the opposite end thereof to the ground wire 13. The conductor 30 has interposed therein a manually operable switch 39 which is adapted to engage a contact 40 connected by means of a conductor 41 to the conductor 29. The conductor 31 has interposed therein, a manually operable switch 42 which is engageable with a contact 43 connected by a conductor 44 to the conductor 29. The switch member 39 also includes a second contact 45 which is connected by means of a conductor 46 to a conductor 47. The latter conductor 47 is connected to the conductor 19 and through this conductor to the conductor 17. The conductor 46 has interposed therein a pilot light 48 which is adapted to be energized upon engagement of the switch member 39 with the contact 45. The switch member 42 also includes a second stationary contact 49 which is connected by means of a conductor 50 to the conductor 47 and a pilot light 51 is interposed in the conductor 50. Closing of the switch including the switch arm 42 and the contact 49, will energize the pilot light 51. The two universal bars 34 and 35 form one series of a plurality of typewriters which may be of any desired number and a second series of typewriters embodying universal bars 52 and 53 are also adapted to be connected with the relay 18. The conductor 38 has connected therewith a ground conductor 54 which is connected by conductors 55 and 56 to the universal bars 52 and 53 respectively. A stationary contact 57 is associated with the universal bar 52 and a stationary contact 53 is associated with the universal bar 53. A manually operable switch 59 is interposed in the conductor 54 so that the ground wire 54 may be disconnected from the ground 38.

The contact 57 has connected thereto one end of a conductor 60 and the opposite end of the conductor 60 is connected to a switch arm 61. A contact 62 is disposed in the path of the switch arm 61 and the contact 62 is connected by a conductor 63 to the conductor 29. A second stationary contact 64 is correlated with the switch arm 61 and is connected by means of a conductor 65 to the conductor 47. A pilot light 66 is interposed in the conductor 65 and is adapted to be energized when the switch arm 61 closes the electric circuit to the contact 64.

The stationary contact 58 is connected by means of a conductor 67 to a manually operable switch arm 68 and a contact 69 is adapted to be engaged by a switch arm 68 in one position thereof for closing an electric circuit from the stationary contact 58 through the conductor 67, switch arm 68, contact 69 and conductor 70 to the conductor 29. A second stationary contact 71 is correlated with the switch structure including the arm 68 and the contact 69 and is connected by means of a conductor 72 to the conductor 47. A pilot light 73 is interposed in the conductor 72.

The relay 21 has correlated therewith a movable armature 74 which is pivotally mounted, as at 75, and is adapted to be drawn toward the core 76 of the relay 21 against the tension of a spring 77 when the relay 21 is energized. The armature 74 constitutes a relay switch and is held normally by means of the spring 77 in engagement with a fixed contact 78. The contact 78 is connected, by means of a conductor 79, to a rectifier 80 of conventional construction which is connected by means of a conductor 81 to the conductor 17. The armature 74 is connected by means of a conductor 82 to one side of an electrical discharge condenser 83 of conventional construction and the other side of the discharge condenser 83 is connected by a conductor 84, to another side of the rectifier 80. A further side of the rectifier 80 is connected by means of a conductor 85 to the ground which may be the conductor 16.

The conductor 84 is connected by means of a conductor 86 to one side of a relay 87 and the other side of the relay 87 is connected by means of a conductor 88 to a stationary contact 89 which is disposed in the path of the movement of the armature 74 when the armature 74 is drawn toward the core 76 of the relay 21. At the time the armature 74 is drawn toward the core 76 of the relay 21 the electric circuit from the rectifier 80 to the discharge condenser 83 will be broken and at this time the discharge condenser 83 will be placed in a closed circuit with the relay 87 by engagement of the armature 74 with the contact 89. The closing of the circuit which includes the condenser 83, conductor 82, armature 74, contact 89, conductor 88, relay 87, conductor 86 and conductor 84, will energize the relay 87 and draw toward the core 90 of this relay a spring pressed armature 91 which is pivoted as at 92. The armature 91 is constantly urged away from the core 90 by means of a spring 93. The armature 91 has connected to the free end thereof, one end of a second stylus 94 which is disposed in overlying position with respect to the tape or recording strip 27 and is adapted to mark an indication 95 on the tape 27 in laterally spaced parallel relation with respect to the indication 28.

In order to provide a means whereby the instructor may signal a student so that the student will know he is to make a recording of the performance of his typewriter, I have provided a signal light 96 which is adapted to be positioned closely adjacent a typewriter and has one side thereof connected as by a conductor 97 to the ground. The other side of the light 96 is connected by a conductor 98 to a stationary contact 99 which is contacted by a spring-pressed switch arm 100 pivoted as at 101 and constantly urged away from the contact 99 by means of a spring 102. The arm 100 is formed with a hook 103 on which a pair of earphones 104 are adapted to be hung and the weight of the earphones 104, will hold the switch arm 100 in engagement with the

contact 99 against the tension of the spring 102. One side of the earphones 104 is connected by means of a conductor 105 to the ground and the other side of the earphones 104 is connected by means of a conductor 106 to a stationary contact 107 disposed in opposite relation to the contact 99 and in a position for engagement with the switch arm 100 when the earphones 104 are lifted from the hook 103 and the arm 100 is moved upwardly by the spring 102. The switch arm 100 is connected by means of a conductor 108 to a manually operable switch 109 which includes a stationary contact 110 connected by means of a conductor 111 to a stationary contact 112. The contact 112 is disposed in the path of the movement of the combined armature and switch member 113, which is adapted to be drawn toward a relay core 114 forming part of the relay 115. One side of the relay 115 is connected by means of a conductor 116 to the conductor 47 and the other side of the relay 115 is connected by means of a conductor 117 to the armature 113. The armature 113 is constantly urged to a circuit breaking position with respect to the contact 112 by means of a spring 118. The conductor 111 has interposed therein a signal or pilot light 119 which is adapted to be energized when the circuit is closed, by engagement of the armature 113 with the contact 112, and closing of the switch, including the switch arm 109 and the contact 110.

A second signal light 120 is adapted to be correlated with one of the second series of typewriters and it will of course, be understood that each typewriter, which is fragmentarily shown by the universal typewriter bar, is adapted to have a signal light 96 or 120 disposed closely adjacent thereto so that the student operating the typewriter will be able to determine when his particular typewriter is in the testing or recording circuit. The signal light 120 is connected by means of a conductor 121 to the ground and by a conductor 122 to a stationary contact 123. The stationary contact 123 is engaged by means of a pivoted switch arm 124 having a hook 125 on which a pair of earphones 126 are adapted to be disposed. One side of the earphones 126 is connected to the ground by means of a conductor 127 and the other side of the earphones 126 is connected by means of the conductor 128 to a contact 129 opposing the contact 123 on the opposite side of the switch arm 124. A spring 130 is engaged with the arm 124 and is adapted, upon lifting of the 'phones 126 from the hook 125, to swing the arm 124 into engagement with the contact 129. An arm 124 is connected by means of a conductor 131 to a manually operated switch 132 having correlated therewith stationary contact 133 which is connected with the conductor 111.

In order to provide a means whereby the strokes of the typewriter may be accurately counted, in addition to being recorded on the tape 28, I have provided an electrically operated counter 134 of conventional construction which has one side thereof connected as by a conductor 135 to conductor 29. The other side of the counter 134 is connected by means of a conductor 136 to the conductor 38 thereby to ground 16 and a manually operable switch 137 is interposed in the conductor 136.

It will be understood that the apparatus hereinbefore described is adapted to be positioned in a class room having rows or series of typewriters any one of which may be placed in circuit with

the recording and signalling structure. The student operating the typewriter which is under test may be given a musical rhythm through the medium of an amplifier or public address unit, generally designated as 138. The unit 138 is of conventional construction and is connected, as by conductors 139 and 140, to a source of electric current supply and a switch 141 is interposed in the conductor 140. The amplifying or public address unit 138 includes phonograph connections 142 and 143, radio connections 144 and 145 and microphone connections 146 and 147. The unit 138 has output conductors 148 and 149 connected to the output side thereof, and the conductor 148 is connected to a pair of switches 150 and 151. The switch 150 is connected at one side thereof by a conductor 152 to the conductor 108 and by the conductor 153 to the conductor 148. The conductor 149 is connected to a pair of manually operable switches 154 and 155 and the switch 154 is connected to the conductor 108. The switch 155 is connected to a common connecting conductor 156 which connects the movable switch arms of the switches 132, 151 and 155 together. When the switch 154 is closed one side of the amplifier 138 is connected to the signal light 96 and to the earphones 104 when the earphones 104 have been lifted from the hook 103. When the switch 155 is closed the signal light 120 will be lighted initially and the earphones 126 will be in circuit with the amplifier 138 when the earphones 126 have been lifted from the hook 125. The amplifier unit 138 has a ground connection 157 and is also provided with a loud speaker conductor 158 which is connected to one side of a loud speaker 159. A manually operated switch 160 is interposed in the conductor 158, and the other side of the loud speaker 159 is connected by a conductor 161 to the ground.

In the use and operation of this system the switch 13 is initially closed to energize the transformer 10. The tape 27 is operated continuously by mechanism (not shown) and as an example the ground switch 39 is moved to a closed position for grounding one series of typewriters. The switch member 39 may be moved to a position engaging the contact 40 thereby closing an electric circuit from the ground side of the transformer 10 through the conductor 38, conductor 36, through the switch structure 32 and 34, conductor 30, switch member 39, conductor 29 to the relay 21 and from the conductor 29 to the relay 18 and then from the relay 18 through the conductor 19 to the conductor 17. When the universal bar 34 is rocked by operation of the typewriter keys, the bar 34 will contact with the stationary contact 32. This will close the circuit to the relays 21 and 18. When the relay 18 is energized the stylus 26 will be moved and will be held in its shifted position so long as the universal bar 34 contacts with the contact 32. This will form dashes between the transverse indications on the tape 27. At the same time where the stylus 26 is being shifted by the relay 18 the energization of the relay 21 will close the circuit to the relay 87. This is effected by engagement of the armature 74 with the contact 89 thus closing a complete circuit from the electrical discharge condenser 83 through conductor 82, condenser 83, conductor 84 and conductor 85 to one side of the relay 87. The other side of the relay 87 is connected with the condenser 83 by the conductor 88 through contact 89, armature 74 and conductor 32. The current built

up in the condenser 83 will be exhausted as soon as the relay 87 is energized and at this time the armature 91 will be moved toward the core 90, thus shifting the stylus 94. The indication or marking formed by the stylus 94 will be substantially triangular markings at one side and if there is any pause between the operation of the typewriter keys there will be straight lines on the tape 27 parallel with the longitudinal edges thereof which are caused by the continuous movement of the tape 27. The particular typewriter which is selected for testing may be selected unknown to the typist, or, if desired, the instructor may signal a particular typist by closing the switch formed by the arm 109 and the contact 110. The signal light 96 may then be lighted by manually moving the armature 113 into engagement with the contact 112. This will energize the relay 115 while at the same time the lamp 96 will be lighted. The selected typist will then remove the earphones 104 from the hook 103 and may receive the typing rhythm from the public address unit 138. The particular rhythm may be either produced from a phonograph or radio, and where the rhythm is produced from a phonograph, the switch 154 is moved to a closed position and the rhythm will flow the public address unit 138, through conductor 149, switch 154, conductor 108, to switch arm 100 which at this time is in engagement with the contact 107 and from the contact 107 through conductor 106, earphones 104 and conductor 105 to the ground. To send rhythm through earphones 104 by radio or by microphone, switch 150 will be closed to energize conductor 148 from the public address unit 138, through point 153, through switch arm 150, through conductor 152, through conductor 108 thereby to earphones 104.

With a system of this kind, any selected typist may be placed under a test for determining the evenness of his typing, or if desired, the entire series or several series of typists may be given a rhythm through the loud speaker 159 when the switch 160 is closed. If it is desired at any time to determine the speed of a selected typist, the switch 137 may be closed, thus closing the electric circuit from the conductor 136 which is connected to the ground 16 through conductor 38, and conductor 135 is connected to conductor 29 so that when any one machine is operating on meter, when the switch arm 137 is closed, the counter will operate. The counter 134 will register the individual typing strokes, so that after a predetermined period of time, the number registered on the counter can be calculated to determine the number of words written by the selected typist.

20 What I claim is:

In combination, an electric circuit, a typewriter, a switch interposed in said circuit and connected to said typewriter for operation by the latter, a pair of styli, a movable tape correlated with said styli, an electric operator for each stylus interposed in said circuit and operable upon closing of the switch by operation of said typewriter to effect actuation of said styli to thereby form on said tape visible recordings of the typewriter operation and means connected with one of said operators for automatically deenergizing said one operator after the latter has been momentarily energized whereby one stylus will produce a recording different from the other stylus and a relay connected to said one operator for controlling the latter and in series with the other operator.

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