

July 24, 1951

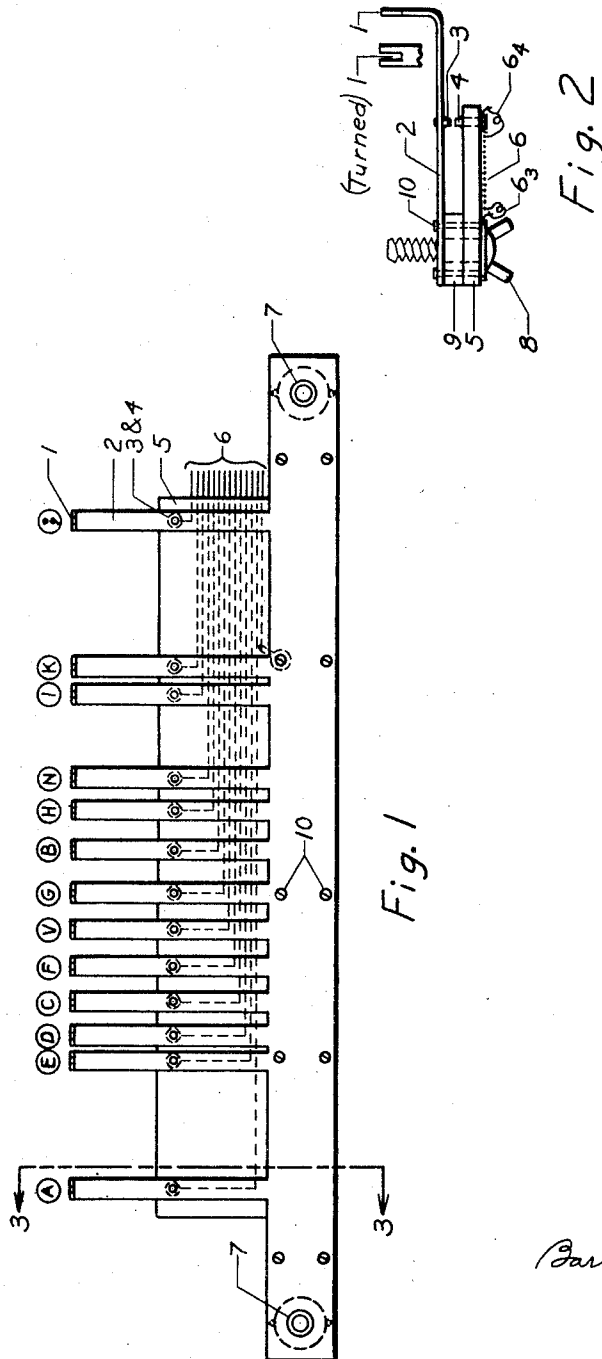
B. EDWARDS

2,561,615

TYPEWRITING MACHINE ATTACHMENT

Filed Feb. 7, 1947

2 Sheets-Sheet 1



Barrett Edwards,
INVENTOR.

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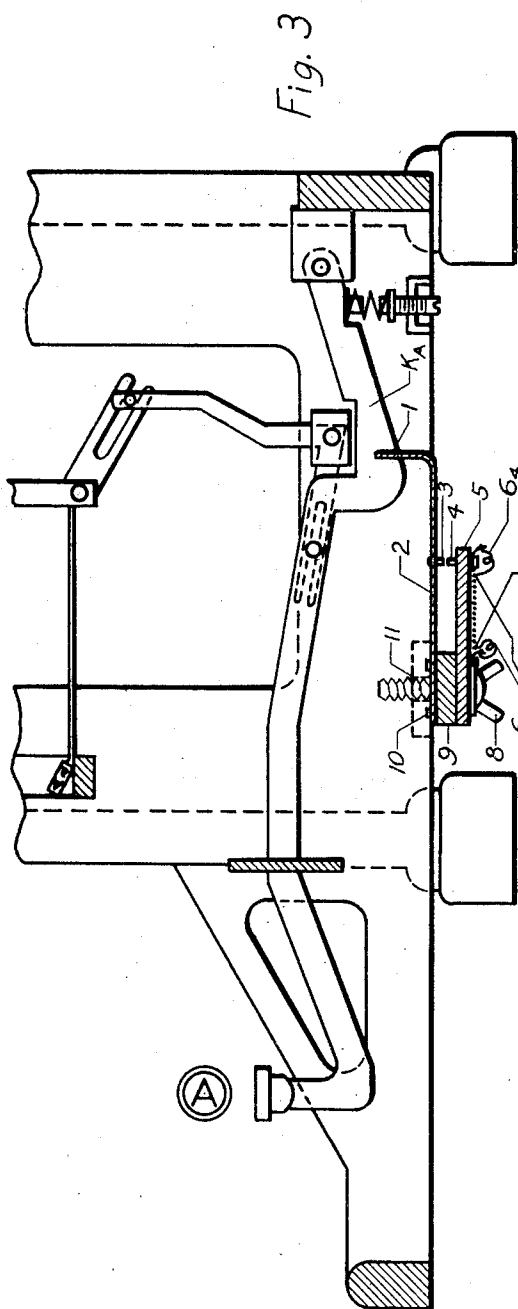
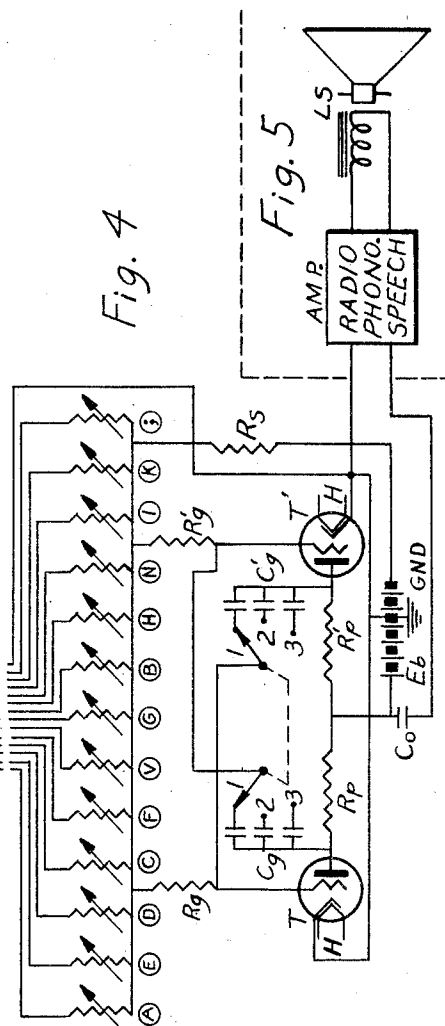
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TYPEWRITING MACHINE ATTACHMENT

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2 Sheets-Sheet 2



Burtlett Edwards,
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UNITED STATES PATENT OFFICE

2,561,615

TYPEWRITING MACHINE ATTACHMENT

Bartlett Edwards, San Antonio, Tex.

Application February 7, 1947, Serial No. 726,978

2 Claims. (Cl. 84-423)

1

This invention relates to typewriting machine attachments and to musical instruments, and it has for its principal object the provision of a mechanical-electrical attachment for typewriting machines whereby the keyboards of typewriting machines are utilized for the playing of music.

This invention is of the nature of an attachment exactly dimensioned to fit typewriting machines in a congruent manner, and in such a relation thereto, separate moveable devices of the attachment, carrying affixed electrical contacts, engage corresponding typewriter key-levers whose keys on the typewriter keyboard, when depressed in the usual typing operation, will move the engaged moveable devices and their affixed electrical contacts to close with other corresponding electrical contacts thereby completing separate electrical sub-circuits of a specially designed vacuum tube multivibrator which is connected to any conventional vacuum tube audio amplifier with loudspeaker.

More clearly, the aforementioned separate electrical sub-circuits of the multivibrator together with the main multivibrator circuit are designed to create electrically, in the multivibrator, either a reasonable facsimile, or by carefully engineered electrical components in the multivibrator, an exact facsimile of the true timbre of the tones produced by any of the conventional musical instruments such as the organ, violin, saxophone, flute, etc., the whistle from human lips; particularly, the tones of one or more of the conventional musical instruments requiring accompaniment.

Further, the aforementioned separate electrical sub-circuits of the multivibrator are designed with a separate control which may be manually varied to tune each sub-circuit to the exact frequency of one of the successive tones of the conventional musical instruments.

My invention resides precisely in the combination of relative parts included in the new and useful mechanical-electrical typewriting machine attachment described in detail in this specification; my invention excludes the associated typewriter, multivibrator and audio amplifier with loudspeaker.

The principle of the typewriting machine attachment is clearly evident, to anyone skilled in the science, from this specification wherein is contained one of the best modes of applying the principle to provide the typist with an instrument for reproduction of the tones of, and tuning with, one or more of the conventional musical instruments.

2

In making use of the invention attached mechanically to a typewriting machine and properly connected electrically to a specially designed multivibrator for creating musical tones of a definite timbre, or timbres, and electrically connected to an amplifier and loudspeaker, the typist tunes the instrument, with reference to the tones of the conventional musical instrument, whose timbre is reproduced by the multivibrator, by bringing respective tones of the multivibrator sub-circuits into sympathetic vibration with the successive tones of the conventional musical instrument merely by variation of the appropriate manual control of the separate sub-circuits of the multivibrator. After thus tuning the typewriter keyboard, the typist procures a copy of sheet music, for example, sheet music written for the violin, and he writes upon the sheet music, and adjacent to the violin notes thereon, the letters or punctuation marks of the typewriter keys producing the respective violin notes, and he plays the consecutive notes of the sheet music from the typewriter keyboard, utilizing his dexterity as a typist.

As a specific example of the use of my invention, namely, the typewriting machine attachment, electrically connected to a specially designed multivibrator wherein is produced the timbre of the whistle from human lips, and the separate sub-circuits tuned, by reference to the piano keyboard, to any octave represented on the piano, the typist may literally whistle upon the typewriter keyboard from sheet music, any tune with which he is familiar. He is limited only by his typing skill which he may be induced, by the invention, to improve.

There is incorporated in the object and nature of the invention, a particular utility of the typewriter keyboard in an arrangement for the greatest facility in thus operating the same. In this connection, the particular arrangement shown herein procures a utility wherein the principal alphabetical notes of the musical octave are made by the keys of the typewriter with the same alphabetical notation, except for the upper eighth note of the octave; for example, for the principal notes on the musical stave A, B, C, D, E, F, G, utility is made of the keys on the typewriter of these same letters, and for the principal eighth note C', utility is made of the V typewriting key whose position is immediately to the right, or, in regard to a piano keyboard, above C on the typewriter keyboard; all of the above mentioned typewriter keys are struck by fingers of the left hand. Further, the particular arrangement shown here-

3

in, provides utility of corresponding typewriter keys struck by corresponding fingers of the right hand for the musical flat notes, or sharps. This particular arrangement, as well as others of this nature, provide the factor of greatest utility through both the sameness of the principal alphabetical musical notes and the alphabetical keys of the typewriter, and the arrangement, with respect to the keys for the principal notes, of relative position on the typewriter keyboard of the keys for the sharps and flats associated with the principal notes, thereby simplifying the process of note finding on the typewriter. This particular arrangement obtains an inherent correlation between typewriting machine keyboards and existing standards in music with the resulting ease of learning to play music from the typewriter keyboards and of learning to read sheet music notation, thereby facilitating the acquirement of a rudimentary knowledge of music.

The object and nature of my invention is shown further in a brief description of the several views of the drawings: Figure 1 is a top view of one design of the typewriting machine attachment whose moveable devices are spaced and shaped to be actuated by certain keys of the typewriting machine shown as A, E, D, C, F, V, G, B, H, N, I, K, and ;. Figure 2 shows the right side view of Figure 1; showing the side view of the construction and arrangement of the parts composing the attachment in this particular design. Figure 3 is a sectional view taken at 3—3 in Figure 1 showing the typewriting machine attachment in adjunct with the typewriter; attached by using the holes in the frame for fastening the typewriter to a desk; showing the congruent relationship of the attachment with typewriting machines and the function of the typewriting machine key-levers associated with, and cooperating the moveable devices and their electrical contacts when attachment is complete. Figure 4 shows the electrical connection of the attachment to the specially designed vacuum tube multivibrator which provides in its design for both the electrical waveform, or particular timbre, and variation of the frequency, or tuning, of the tones of any arbitrarily chosen conventional musical instrument. As shown in Figure 5, by connecting the multivibrator output to the input of any conventional audio amplifier and loudspeaker, the output from the multivibrator is audibly reproduced.

The following is a full, clear, concise, and exact description of this invention which will enable any person skilled in the art or science to which the discovery appertains, to construct and use the same:

With reference to the attached drawings, Figures 1 and 2 show the detailed construction of the typewriting machine attachment. The moveable devices 2 are spaced, formed and notched for congruity and engagement with the typewriter key-levers of the keys A, B, C, D, E, F, G, for selection of the musical notes of these same letters, and key-lever of key V for the upper eighth note in the musical octave; the typewriter key-levers of the keys N, H, I, K and ; are for selection of the flats associated with the above musical tones, thus obtaining a complete octave as it is on the piano keyboard.

In Figure 1, the number 2 shows that the moveable devices are cut or stamped from a sheet of thin phosphor bronze metal, stainless steel, or other suitable metal, such that all of the moveable devices are part of a common metal sheet

4

located between the spacing plate 9 and the typewriting machine frame, as in Figure 3. Shown in Figure 2 fixed to the moveable devices are electrical contacts 3; immediately beneath these contacts are the corresponding electrical contacts 4 which are insulated from one another by being mounted on the insulated-contact-plate 5, Figure 1. Individually insulated wires connected to each of the corresponding electrical contacts 4, shown as 6, in Figure 3, and with the single insulated lead connected to the moveable device plate 2, labelled 6₃ in Figure 3, form a cable of electrical pairs which lead from each set of corresponding electrical contacts to the respective variable tuning resistors AEDC etc., of the multivibrator shown in Figure 4.

The insulated-contact-plate 5, the spacing-plate 9 and the moveable-device-plate 2, are fastened rigidly together by the machine screws 10, Figures 1 and 2. Part of each of the three aforementioned plates extend right and left in Figure 1 with holes 7 through them permitting the thumb-screws 8 to fasten the attachment to the typewriter frame in the holes 11 in the typewriter frame as shown in Figure 3.

In Figure 3, depressing the typewriter key A lowers its key-lever KA, which constantly engages in the notch 1, the moveable device 2, causing the electrical contact 3, by the action of flexation, to close with the corresponding electrical contact 4. Closure of the electrical contacts completes the electrical circuit shown in Figure 4 composed with the variable tuning resistor A which determines the frequency of the sub-circuit of the multivibrator within the range necessary for successful tuning of this tone to the A tone of a given octave; for example, the A tone of a given octave on the piano keyboard. In order to get the tone to resemble that of the violin, saxophone, organ, etc., or the whistle from the human lips, the values of the electrical components in the multivibrator main circuit and sub-circuits must be designed to contain certain electrical components; for example, to produce the human whistle the values of C_g and C_g' , and the values of R_g and R_g' are composed of relatively high values of C_g and C_g' and relatively low values of R_g and R_g' in order that the multivibrator produce the tones of the timbre of the whistle from the human lips; after this has been accomplished, the resistor A is varied to bring the tone into tune, for example with the A note of the middle C octave of the piano keyboard. The C_g — R_g' and the C_g' — R_g components may be designed to contain a series-parallel combination of sub-components, depending upon the necessity in electrical design, in order to obtain an exact facsimile of true timbre.

The multivibrator is normally stopped, when no key is depressed, by the high negative bias, upon the grids of the vacuum tubes T and T', obtained from the high voltage supply Eb, Figure 4, through the high resistance of R_s . When a typewriter key is depressed, normal grid bias is placed on the tubes T and T' and the multivibrator is instantly operative at the pre-determined tone, and at the frequency, associated with the particular typewriter key which is depressed. Audible reproduction from the multivibrator is obtained through amplification by electrical connection to any suitable conventional amplifier and loudspeaker as shown in Figure 5.

The multivibrator operates in the conventional oscillatory manner and the electrical circuit is conventional except for (1) the introduction of

the variable tuning resistors shown in Figure 4 as AEDC etc., which notation corresponds to the key of the typewriter keyboard with the same notation, and (2) the arrangement of the multivibrator circuit into separate independent sub-circuits so that each is a function of the separate moveable devices of the typewriting machine attachment co-operated by the separate keys on the typewriter keyboard in the usual typing operation and (3) the arrangement of the multivibrator circuits into more than one separate main circuit with sub-circuits, so that the tones of more than one conventional musical instrument may be produced in the same multivibrator and each may be selected as desired by switching as shown in Figure 4 by the electrical switches with positions 1, 2, 3, in connection with C₂ and C₂'.

The above specifications set forth the exact invention for which a patent is solicited and explains the principle thereof; however, the particular design and configuration shown is considered merely the best mode in which I contemplate applying the principle of this invention. It is apparent to anyone skilled in the art or science that there is more breadth, and probably superiority, of design and arrangement not shown but entailing no departure from the spirit of the invention, and it is my desire to be limited only in this respect.

What I seek to secure by United States Letters Patent is:

1. In a typewriting machine attachment of the type described for selectively controlling musical tones created by a specially designed multivibrator with amplifier and loudspeaker, the combination including a moveable-device-plate disposing a number of separate moveable devices carrying separate electrical contacts, each of the said separate moveable devices engaging and co-acting separately with a corresponding typewriting machine key-lever which moves individually the separate moveable device and its affixed electrical contact when the typewriter key associated with said key-lever is depressed in the usual typing operation upon the keyboard; an insulated electrical-contact-plate disposing a number of corresponding electrical contacts with which each of the moveable-device-electrical contacts is moved into closure by the typewriting machine key-lever engaging and co-operating said moveable device when the associated typewriter key is depressed in the usual typing operation upon the keyboard; a spacing-plate between the moveable-device-plate and the insulated-contact-plate for obtaining a normal gap between the corresponding electrical contacts; an electrical cable of insulated electrical wires composed of a com-

mon wire connected to the moveable-device-plate and one wire connected to each of the insulated corresponding electrical contacts, thereby forming electrical pairs from each set of corresponding electrical contacts for connection to corresponding tunable electrical sub-circuits of the specially designed multivibrator; and mechanical fasteners for attachment of said combination to a typewriter.

2. In a typewriting machine attachment of the type described for selectively controlling musical tones created by a specially designed multivibrator with amplifier and loudspeaker, an electro-mechanical combination including one electrical mechanism disposing a number of separate moveable mechanical devices having affixed electrical contacts, each of said separate moveable mechanical devices engaging and co-acting separately with a corresponding arbitrarily chosen typewriting machine key-lever which moves said moveable device together with its affixed electrical contact when the typewriting machine key associated with said key-lever is depressed in the usual typing operation upon the keyboard; another electrical mechanism disposing a number of electrical contacts to correspond with each of the moveable device electrical contacts, each of said moveable device electrical contacts moveable into closure with its corresponding electrical contact by the engaged typewriter key-lever co-operating said moveable device carrying said electrical contact when the typewriter key associated with said key-lever is depressed in the usual typing operation upon the keyboard; an electrical cable composing a number of separately insulated wires connected to each of the moveable electrical contacts and to each of the corresponding electrical contacts, and the two wires connected to each pair of corresponding electrical contacts for connection to a corresponding tunable electrical sub-circuit of a specially designed multivibrator; and mechanical fasteners for attachment of this electro-mechanical combination to any typewriter.

BARTLETT EDWARDS.

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