March 10, 1931. S. TOFÉ Y BONILLA 1,795,468

AUXILIARY KEYBOARD

Filed March 14, 1929 2 Sheets-Sheet 1

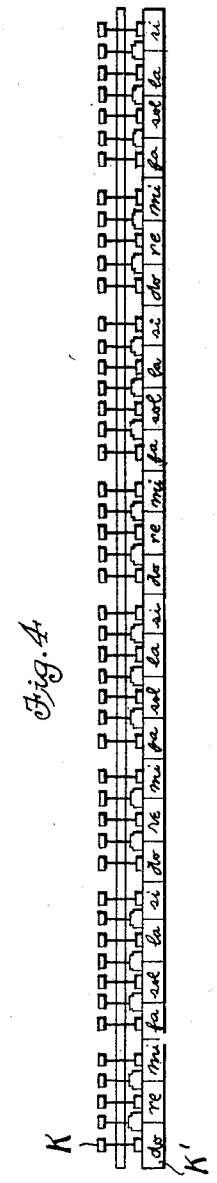


Fig. 4

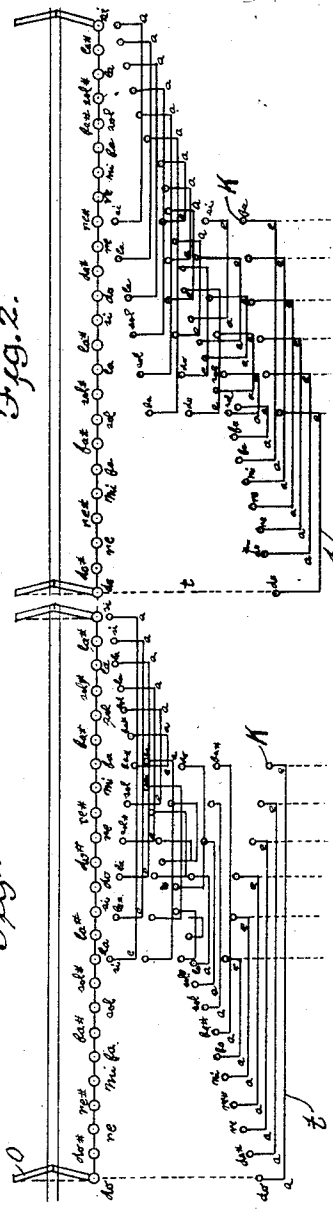


Fig. 2.

Fig. 1.

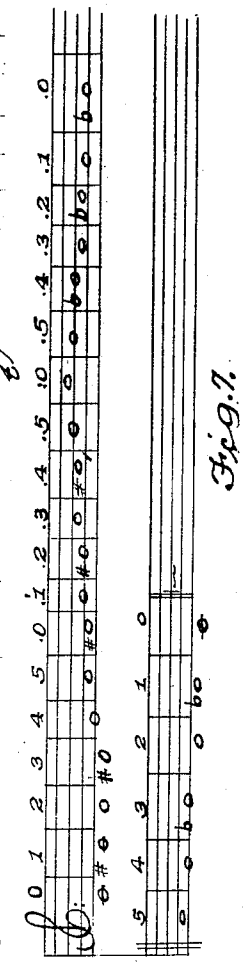


Fig. 3.

INVENTOR.
Saturnino Tofe' y Bonilla
BY Connolly Bros

ATTORNEYS

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AUXILIARY KEYBOARD

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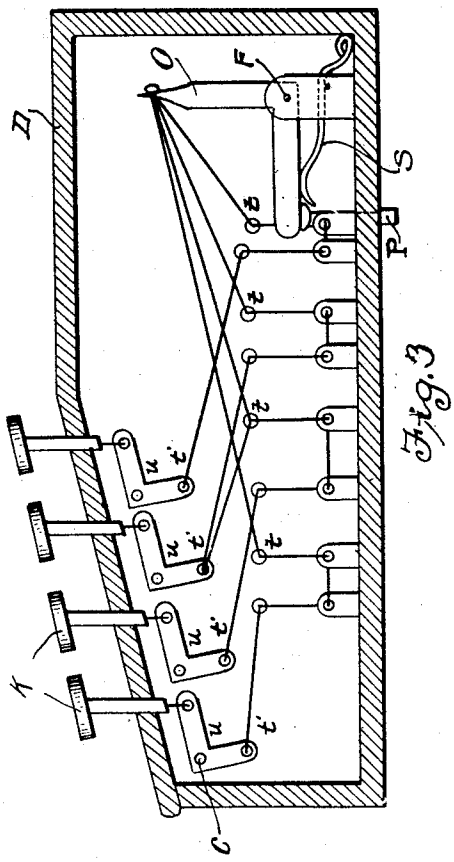


Fig. 3

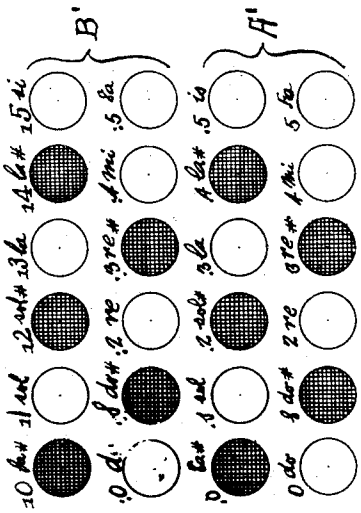


Fig. 6.

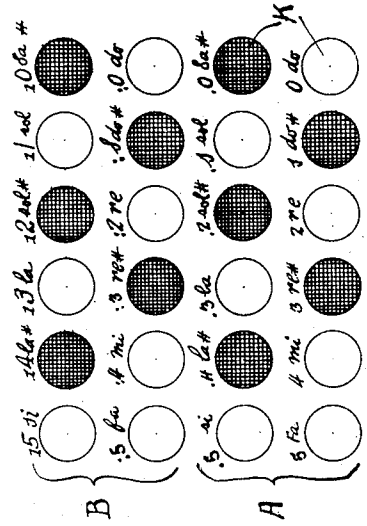


Fig. 5.

INVENTOR.
Saturnino Tofé Y Bonilla
BY Connally Bros

ATTORNEYS

Patented Mar. 10, 1931

1,795,468

UNITED STATES PATENT OFFICE

SATURNINO TOFÉ Y BONILLA, OF GIMILEO, SPAIN

AUXILIARY KEYBOARD

Application filed March 14, 1929, Serial No. 347,113, and in Spain March 17, 1928.

My invention relates to a new and improved system of musical notation, and to a keyboard which enables said system to be utilized.

One of the objects of my invention is to facilitate the playing of keyboard instruments such as organs, harmoniums, and pianos.

Another object of my invention is to provide a system of musical notation which is especially adapted for keyboard instruments for which music is written in the chromatic scale.

Another object of my invention is to provide a keyboard mechanism which can be movably applied to a piano or organ or harmonium, so that any of the said musical instruments can be played by manipulating the improved keyboard mechanism.

Another object of my invention is to provide a keyboard mechanism for a piano, harmonium, or organ, in which the keyboard comprises a plurality of rows or series of keys, each said row or series having six keys which are preferably indicated by the numerals 0, 1, 2, 3, 4 and 5. Each of these rows of keys corresponds to half of a chromatic scale. The keyboard may have any suitable number of said rows of keys, each of said rows being correspondingly numbered. The keyboard may have four, five or six rows of said keys. Each key in a row is depressed by one of the fingers of the player, save that the key indicated by "0" can be played either with the thumb or with the index finger.

Another object of my invention is to provide a keyboard of the type above described for each hand of the player so that the same single notes, as well as the chords, duos, and arpeggios, are always played with the same fingers.

Another object of my invention is to substitute an improved number system of musical notation for the one now used, in order to eliminate various symbols such as clefs, sharps, flats, etc.

Another object of my invention is to provide auxiliary identifying marks for the keys in each row of the keyboard, so as to identify the corresponding notes.

Another object of my invention is to arrange the rows one behind the other, as in the keyboard of a typewriter, so that it is merely necessary to move the hands towards or away from the body of the player, and it is not necessary to move the hands in a direction parallel to the body of the player.

Another object of my invention will be set forth in the following description and drawings which diagrammatically illustrate the same.

Fig. 1 diagrammatically illustrates the keyboard played by the left hand of the player.

Fig. 2 illustrates a similar keyboard, played by the right hand of the player.

Fig. 3 diagrammatically illustrates the connecting means between the auxiliary keys and the playing mechanism of the organ or the like.

Fig. 4 diagrammatically illustrates how the keys of the auxiliary keyboard correspond to the keys of the instrument.

Fig. 5 diagrammatically illustrates the left-hand keyboard section.

Fig. 6 diagrammatically illustrates the right-hand keyboard section.

Fig. 7 illustrates a sheet of music according to the improved system.

The embodiment shown herein illustrates how forty-eight keys may be divided into two sections, so that twenty-four of said keys can be played by the left hand, and the remaining twenty-four can be played by the right hand. This is clearly shown in Figs. 5 and 6, which also show how each section of the keyboard is divided into rows, each of said rows having six keys. The rows are arranged one behind the other, as in a typewriter, the rear rows representing the higher notes.

A chromatic scale comprises twelve notes and according to my improved system these twelve notes are divided into two series, each said series comprising six notes. The notes of each said series are designated by the numerals 0, 1, 2, 3, 4 and 5, and these designative numerals may be indicated upon the keys K.

For example, the reference leters A, A′, B and B′ each designate a single octave. For convenience, the keys corresponding to the

half tones may be colored black, and the keys corresponding to the whole tones or intervals may be colored white. By means of this improved system of musical notation, every note may be identified by using one of the above mentioned numerals.

In order to further identify the pitch of a note, the said numerals are provided with auxiliary identifying marks. For example, the first or lowest row in the group identified by the reference letter A, or by the reference letter A′, could be without auxiliary marks. In the next row each numeral has an auxiliary mark consisting of a dot. In the next or consecutive row each numeral has an auxiliary mark consisting of two superposed dots. In the next row, each numeral could have an auxiliary mark consisting of a short upright line. Each of the forty-eight keys K shown in Figs. 5 and 6 is connected to a bell-crank lever *u*, pivotally mounted at C within the casing D. Each of the bell-crank levers *u* has one end thereof connected to a vertically slidable key K and the other end of each said bell-crank lever *u* is connected by means of a wire *t* to a bell-crank lever O pivotally mounted at F. The horizontal arm of each bell-crank lever O is above a hammer P, if the instrument is a piano. The weight of these parts is taken up by springs S so that when a key K is released, the respective lever O is raised by the associated spring S to stop the sounding of the respective tone. The use of the springs S also makes it possible to better regulate the action of the device. Hence, by depressing one of the keys K, the note or tone associated therewith is sounded.

Fig. 4 is intended to diagrammatically illustrate how each of the keys K is associated with one of the keys K′ of the piano, harmonium, or the like. The actual arrangement is shown in Figs. 5 and 6 from which it can be seen that it is not necessary to superpose the keys K, above the keys K′. However, Fig. 4 shows how the auxiliary keys can be caused to actuate members which are located directly above the main keys of the piano or harmonium, so that the invention can be applied directly to any existing piano or harmonium by simply superposing the improved action above the main keyboard of the piano or the like.

In order to indicate the time value of a note, auxiliary marks can be used in connection with the numbers indicating said notes. For example, a whole note can be designated as follows: 2, 4; a half note can be designated as follows: 2, 4; a quarter note can be designated as follows: 2, 4; an eighth note can be designated as follows: 2, 4; a sixteenth note can be designated as follows: 2, 4; a thirty-second note can be designated as follows: 2, 4; a sixty-fourth note can be designated as follows: 2, 4.

The improved keyboard can be slidably located on the piano, harmonium, or the like, and the hammers of the auxiliary keyboard could be caused to operate the keys K. In order to be able to slide the auxiliary keyboard over the main keyboard, the black keys of the main keyboard may be cut so that their tops are in the same plane as the tops of the white keys.

I prefer to enclose all the auxiliary keys within a casing D. Of course, additional rows of keys K could be utilized. Since the improved keyboard can be utilized for operating the ordinary keys of a piano, harmonium, or organ, it is not necessary to make these musical instruments of special construction in order to enable them to be played by a musical notation system which is based on numbers.

The improved keyboard makes it possible to play chords which cannot be played on any other keyboard, because the hand of the player can reach notes in two different octaves. It is therefore possible to simultaneously play with one hand in two octaves. In order to do this with the use of the ordinary keyboard, it is necessary to have two players. That is, it is possible for the player to simultaneously actuate keys K in the first row and in the third row of the left-hand keyboard or the right-hand keyboard.

The improved keyboard also facilitates the work of the composer because it enables the playing of compositions which can be played on the ordinary longitudinally disposed keyboard.

The improved keyboard makes it much more easy to learn to play an instrument of this type because the fingering is always the same, and the same finger plays only two different notes as it goes from one row to the succeeding rows.

Any musical composition can be transposed a major quarter by merely playing in the next row of the keyboard.

As soon as a player learns all the chords which can be played by operating the keys K in the first and second rows of the improved keyboard, he can immediately play the same chords in different keys, by merely playing with the same fingers on the second and third rows of the improved keyboard, etc.

It is possible to play chords of three notes by only using two fingers, because the rows are sufficiently close to each other. For example, do# and sol can be played with one finger, and mi can be played with another finger.

As soon as the player knows how to play in the first and second rows, he knows how to play in all the other rows, because series A is identical with series D.

A musician who knows how to play on the piano or the like, can easily learn how to play on the improved keyboard without being required to determine the key of F because the

music played by the left hand is not the same key as that played by the right hand.

After learning how to play by the use of the keys contained in the first and second rows, it is not necessary to learn additional fingering, because the same note corresponding to the same key is always played with the same finger.

The high octaves are played on the upper rows of keys, and the low octaves are played on the lower rows of keys. Once the chords, duos and arpeggios are played, they are always played with the same hand.

This keyboard makes it possible to obtain more complete and varied chords than an ordinary keyboard. If the improved keyboard is utilized to play a harmonium, it may have a coupling device for four octaves so that the keyboard will make it possible to simultaneously play chords in four octaves with each hand. Since it is not necessary to move the hands to the right or to the left, the playing is facilitated and it is much more easy for blind people to learn how to play. It is likewise much more easy to print the music for blind people according to the improved system, because the entire system only comprises six numerals and certain auxiliary marks.

An important feature of the invention is that the improved keyboard can be applied to a piano or to a harmonium, in which the main keys, or the mechanical action corresponding thereto, are arranged along a straight line. The auxiliary keys are compactly arranged according to my invention, and these auxiliary keys are provided with suitable connecting mechanism, as diagrammatically shown in Figs. 1 and 2, so that the actuation of an auxiliary key which is directly in front of the player, can actuate one of the members of the musical instrument which is far away from the central portion of the instrument.

I am aware of patents such as British Patent No. 220,824 which related to concertinas. However, in playing a concertina, it is necessary for the player to support the instrument. My invention is limited to instruments of the type of a piano, harmonium and organ, which are ordinarily horizontally supported, independently of the player. Likewise, according to the improvements specified herein, the auxiliary keys do not directly control the parts of the musical action.

I claim:

1. A keyboard for a musical instrument which is supported in horizontal position independently of the player, comprising two groups of keys, one of said groups being adapted to be played with the left hand, the other of said groups being adapted to be played with the right hand, each of said groups having a plurality of horizontally disposed rows located one behind the other, each of said rows having six keys corresponding to one-half of the tones of a chromatic scale, each row being higher than the preceding row and having its keys arranged along a substantially straight line, and connecting means intermediate said keys and the parts of the musical action of the instrument so that the actuation of one of said keys can produce the actuation of a part of said musical action which is relatively remote from the player.

2. A keyboard for a musical instrument which is supported in horizontal position independently of the player having a musical action which comprises a plurality of movable members, said keyboard comprising two groups of keys, one of said groups being adapted to be played with the left hand, the other of said groups being adapted to be played with the right hand, each of said groups having a plurality of rows located one behind the other, each of said rows having six keys corresponding to one-half of the consecutive notes of a chromatic scale so that two consecutive rows in each group correspond to all the consecutive notes of a chromatic scale, and connecting means intermediate said keys and said movable members, so that the actuation of one of said keys can produce the actuation of a movable member of the action which is relatively remote from the player.

3. A keyboard for a musical instrument having a musical action which comprises a plurality of movable members arranged in a line, said keyboard having a plurality of main keys which are respectively connected to the movable members of said action, a supplemental keyboard connected to said movable members of the action intermediate said movable members and said main keys, so that said movable members can be actuated either by the main keys or by the keys of said supplemental keyboard, said supplemental keyboard comprising two groups of keys, one of said groups being adapted to be played with the left hand, the other of said groups being adapted to be played with the right hand, each of said groups having a plurality of rows located one behind the other, each of said rows having six keys corresponding to one-half of the consecutive notes of a chromatic scale so that two consecutive rows in each group correspond to all the consecutive notes of a chromatic scale.

4. A keyboard for a musical instrument which is supported in horizontal position independently of the player having a musical action which comprises a plurality of movable members arranged in a line, said keyboard comprising two groups of keys, one of said groups being adapted to be played with the left hand, the other of said groups being adapted to be played with the right hand, each of said groups having a plurality of

rows located one behind the other, each of said rows having six keys corresponding to one-half of the consecutive notes of a chromatic scale so that two consecutive rows in each group correspond to all the consecutive notes of a chromatic scale, said rows being spaced so close to each other as to make it possible to simultaneously play notes of consecutive rows, in order to strike chords.

5. In combination with a musical instrument having a primary keyboard adapted to control the action thereof of said instrument by means of members which are actuated by the keys of said primary keyboard, an auxiliary keyboard adapted to individually operate said members without interfering with the individual actuation thereof by keys of said primary keyboard.

In testimony whereof I affix my signature.

SATURNINO TOFÉ Y BONILLA.