

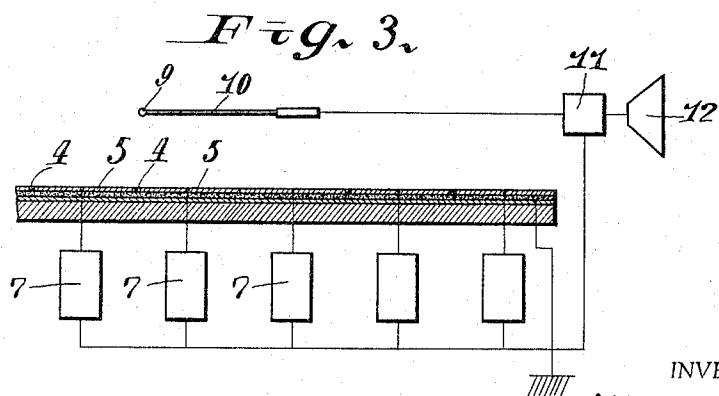
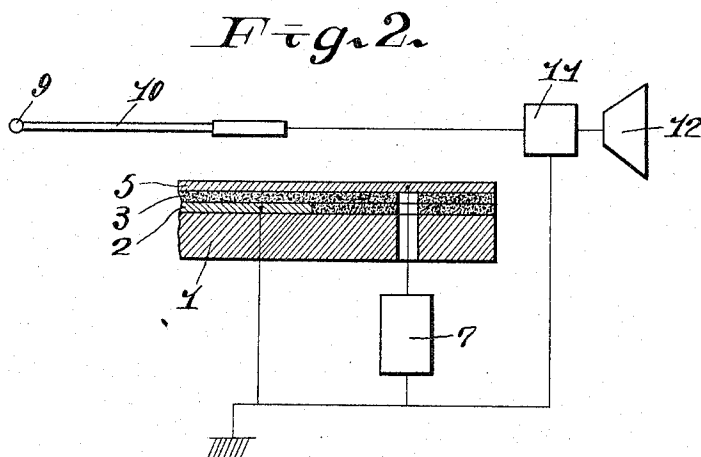
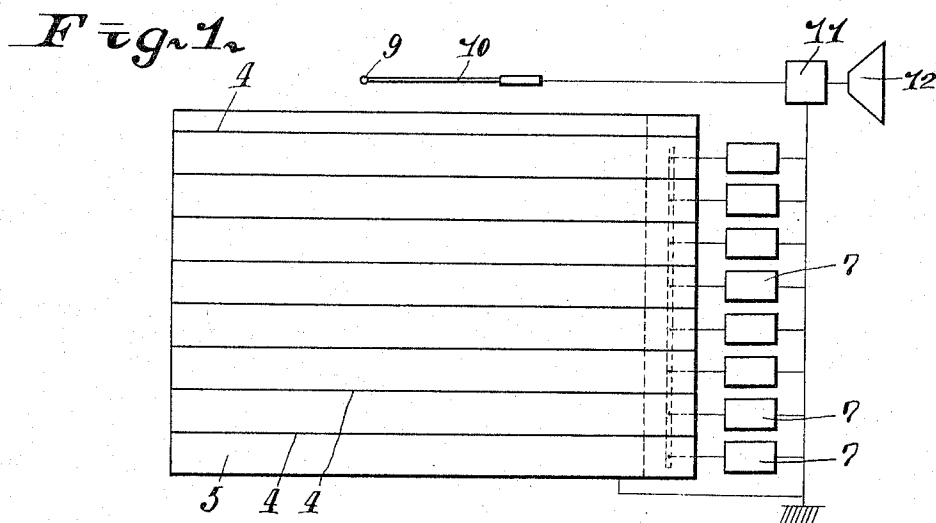
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ELECTRONICALLY SOUNDING BLACKBOARD

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ELECTRONICALLY SOUNDING BLACKBOARD
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This invention relates to an instrument which sounds electronically by tracing music notes written on a blackboard.

One object of this invention is to produce an effect for guidance of reading of music notes and familiarization in musical education, especially at lower classes of elementary schools.

Another object of this invention is to facilitate teaching of music in school education.

Still another object of this invention is to raise music culture of the common peoples by means of reading music notes and hearing the corresponding music tones.

Briefly stated in accordance with the purport of this invention, it is to provide a sounding instrument connecting with a blackboard. The blackboard comprises a base plate which is entirely covered on its surface with aluminium leaf, an insulating film which entirely adheres on and covers the surface of the aluminium leaf, insulating horizontal lines which are drawn at regular intervals with insulating paint and have a narrow and thin elevated layer, and electro-conductive film stripes which are formed by painting electro-conductive paint between each of the two insulating horizontal lines and have a layer equal to a thickness of insulating horizontal lines namely a coplanar surface with said lines. Thus, said blackboard may have many electro-conductive film stripes which are divided by said insulating horizontal lines. The five staff lines of the music score are horizontally drawn with white electro-conductive paint on the requisite places of said film stripes. Said stripes are respectively connected with various proper oscillators which are provided in a separate place. A baton has a connector in the extremity of it and connects with an amplifier. All said oscillators connect with said amplifier which connects with a speaker. If said baton comes in contact with a note written on said blackboard by its connector, a circuit is formed and the speaker may emit the sound of music. Therefore, the oscillators need to be adjusted to oscillate music tones corresponding to the notes respectively.

A teacher holds the baton and traces music notes in order one by one with the connector of it, whereby pupils learn the notes of the scores and the tones of these notes simultaneously. Therefore this invention is very effective for music education.

The invention will be better understood and other objects and additional advantages of the invention become apparent upon perusal of the following description taken in connection with the drawings in which the drawings are illustrative summary figures:

FIG. 1 is a total view of mechanism of parts embodying this invention;

FIG. 2 is a partly broken away traverse side elevation of a blackboard showing a connecting diagram; and

FIG. 3 is a partly broken away longitudinal side elevation of the blackboard showing the connecting diagram.

The blackboard comprises a base plate 1 which is entirely covered on the surface of it with aluminium leaf 2, an insulating film 3 such as polyvinylchloride which adheres on, by polymerisation of monomer, and entirely covers the surface of said aluminium leaf 2, many insulating horizontal lines 4 which are drawn on the insulating film 3 at regular intervals by insulating paint

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and has a narrow and thin elevated layer on said film 3, and many electro-conductive film stripes 5 which are formed by painting electro-conductive paint between each of the two insulating horizontal lines 4 and having a layer equal to a thickness of these lines 4, i.e., a coplanar surface with these lines 4. Thus said electro-conductive film stripes 5 are insulated from each other and connect respectively with oscillators 7 which are provided in a separate place and the five staff lines are horizontally drawn with white conductive paint on requisite places of said conductive film stripes 5. A baton 10 has a connector 9 in the extremity of said baton 10 and is adapted to connect with an amplifier 11. Each said oscillator 7 is adjusted to oscillate individually proper and different tones corresponding to the music notes and provided to operate whenever the circuit of this mechanism is closed.

When music notes which are written with ordinary white chalk on the blackboard of this invention are pointed out so as to press with the connector 9 of the baton 10, said connector 9 comes in contact with the conductive film stripes 5 and the circuit is closed. Therefore the oscillators 7 emit proper signals respectively and the amplifier 11 amplifies them and the speaker 12 emits the corresponding sounds.

Ordinary white chalk is made of comparatively large particles and its adhesive power is small, therefore the notes written on the blackboard do not prevent connecting the connector 9 and the conductive film stripes 5 and if the connector 9 is keen, the connection becomes better and the tones of the notes do not become out of order. Accordingly inductivity of chalk may be ignored in practice.

Aluminium leaf 2 which adheres on the surface of the base plate 1 shields the conductive film stripes 5 through the insulating film 3, whereby interference of oscillation does not emerge in the circuit and confusion of oscillation does not occur. If the circuit is closed through the oscillator 9 and the amplifier 11, the sound emitted from the speaker 12 is a very correct music tone in scales.

Till now, the guidance of reading of music notes and the guidance of familiarization for music are that the teachers sing while they show the music notes by a baton, or musical instruments are provided with connectors and miniature lamps set on a blackboard are lighted and extinguished. In this invention, if the teacher points out the musical notes on the blackboard by the baton, the corresponding sounds of music are emitted, therefore pupils feel very interested in this guidance and the teacher may also accompany or harmonize the electronically sounding blackboard with another musical instrument. As described above, this invention has an excellent effect to be able to use eye and ear simultaneously and is a powerful means for musical education. Additionally, employing a suitably designed amplifier, the tone of music may be modified and the sound similar to the sound of various music instruments may be easily emitted. Regarding the other scales than C major, as the connection of conductive film stripes and oscillators may be changed by switches which are provided in a place separated from the blackboard, desirable tones of music may be emitted.

While a particular embodiment of this invention has been illustrated and described, modification thereof will readily occur to those skilled in the art. For example, conductive parts on the base plate in this invention are easily and massively manufactured by the art of print-wiring or process-print. It should be understood therefore that the invention is not limited to the particular

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arrangement disclosed but is intended to cover all modifications which do not depart from the scope of the invention.

What is claimed as new and desired to be secured by Letters Patent of the United States is:

1. An electronically sounding blackboard comprising a base plate which is entirely covered and attached with aluminium leaf, an insulating film which adheres on and entirely covers insulating horizontal lines which are drawn at regular intervals with insulating paint and which form a narrow and thin elevated layer on said insulating film, electro-conductive film stripes which are formed on said insulating film between each pair of the insulating horizontal lines and which are coplanar with said horizontal lines and connect with oscillators and an amplifier for producing proper signals respectively, a baton which is attached to the amplifier by a connector in the extremity of said baton, and a speaker which connects with said amplifier.

2. An electronically sounding blackboard as claimed in claim 1, in which switches are provided in a separate

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place from the base plate and adapted to change the connections between the electro-conductive film stripes and the oscillators so as to play other musical scales than C major.

3. An electronically sounding blackboard as claimed in claim 1, in which a specially designed amplifier is employed so as to modify the tone of music and thereby the speaker may play the tones of various music instruments.

4. An electronically sounding blackboard as claimed in claim 1, in which the electro-conductive film stripes are formed of electro-conductive paint.

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