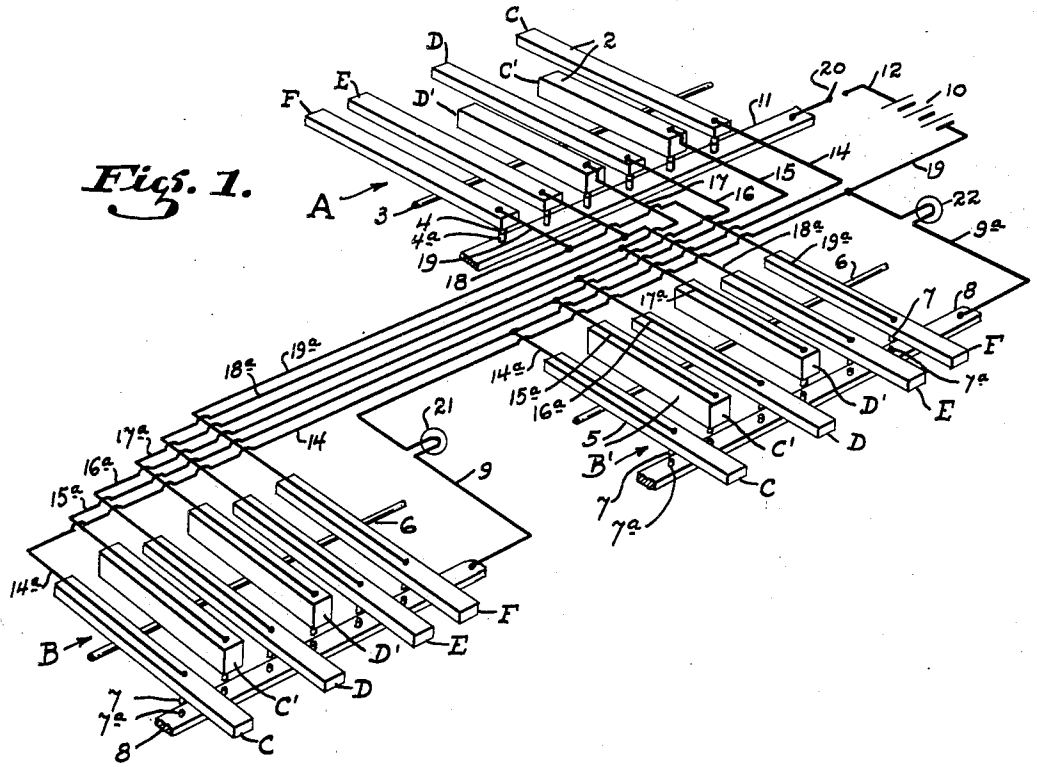
March 12, 1940. C. J. LAMP 2,193,335

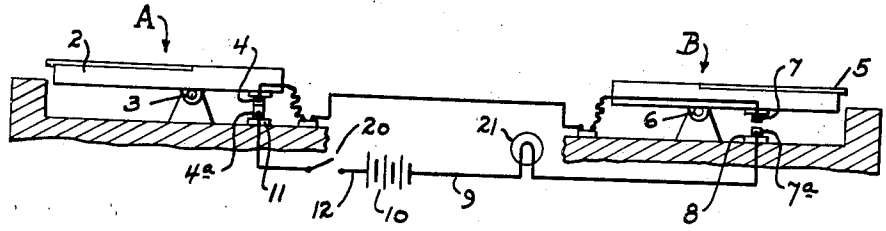
APPARATUS FOR AID IN TEACHING PIANO

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Figs. 1.



Figs. 2.



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APPARATUS FOR AID IN TEACHING PIANO

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4 Claims. (Cl. 84—470)

This invention relates to apparatus for teaching the playing of piano or other key-operated musical instruments, and particularly to means for visually indicating errors of different character.

The object of the present invention is generally to improve and simplify the construction and operation of apparatus of the character described; to provide an apparatus which permits development of kinaesthetic adjustments for sight, muscle usage, pitch correlations, etc.; to provide an apparatus which will visually indicate both to the teacher and to each individual pupil mistakes such as the depression of a wrong key or depression of a key ahead of turn, or such as a key held down too long; to provide an apparatus in which the visual indicating mechanism is electrically operated; and further, to provide an apparatus embodying a master or teacher-operated keyboard or piano and a sufficient number of pupil-operated keyboards or pianos, to insure group activity and the active participation of all pupils.

The apparatus is shown by way of illustration in the accompanying drawing, in which

Fig. 1 is a perspective diagrammatic view showing the manner in which a master piano is connected with a plurality of pupils' pianos; and

Fig. 2 is a vertical cross section of a portion of a master piano and a pupils' piano, showing the manner in which electrical circuits are made or broken by the depression of piano keys.

Referring to the drawing in detail, A indicates a portion of the keyboard of a master piano, and B—B' portions of keyboards of pupils' pianos. The keys 2 on the master piano are pivoted in the usual manner as indicated at 3, and the inner end of each key is provided with a contact 4 which engages a cooperating contact 4a when the keys assume normal position. The keys 5 on the pupils' pianos are similarly pivoted as at 6, and near the outer end of each key is a contact 7 which is adapted to engage a cooperating contact 7a. The contacts 4 and 4a on the master piano normally engage each other and are separated only upon depression of the keys. The contacts 7 and 7a, on the other hand, are normally separated, and engage only when the keys are depressed. All of the contacts 7a on the pupil's piano B are mounted on a common bar or conductor 8 which is connected through a wire 9 with one side of a battery or other suitable source of current supply 10. Similarly, all of the contacts 7a on the pupil's piano B' are connected with the battery through a wire 9a. The contacts 4a on the master piano are also mounted on a common bar or conductor 11, and this is connected through a wire 12 with the other side of the battery.

Only four white keys and two black keys are shown on each piano, and these are indicated on the respective pianos by the reference characters C—C'—D—D'—E and F. The contact 4 on the key C of the master piano is connected through wires 14 and 14a with the contacts 7 on the keys C of the pupils' pianos. The remaining keys are similarly connected by wires and these are indicated by the reference numerals 15, 15a, 16, 16a, 17, 17a, 18, 18a, and 19 and 19a. In the circuit formed by the wire 12 is mounted a switch 20, and in the circuits formed by the wires 9 and 9a are mounted incandescent lamps or globes 21 and 22, the purpose of which will hereinafter be described.

In describing the method of detecting errors, the circuits involved will be traced through the master piano A and only one of the pupils' pianos, as the circuits will be identical and will operate the same whether one pupil's piano or a dozen or more pupils' pianos are being played upon. In the classroom or music room, the teacher will play the master piano and the pupils will be seated at and will play the pupils' pianos. The pupils will depress the same keys as the teacher, and if they do so no lights indicating error will appear; on the other hand, if a wrong key is depressed by a pupil, a light will appear indicating that an error has been made. Also the light or error-indicator will appear if a key is depressed ahead of turn, or when a key is held too long. For instance, if the teacher depressed the key C, and the pupil seated at the piano depresses the key of C, the light 21 will not appear, as the circuit established by engagement of the contacts 7 and 7a on the pupil's piano when the key is depressed is simultaneously broken by separation of the contacts 4 and 4a on the master piano. On the other hand, if the pupil at the piano B should depress the key D instead of the key C, the light 21 would appear and the error would be detected, as the light will be suitably positioned on the pupil's piano so that it can be seen by both the pupil and the teacher.

In tracing this circuit, it must be remembered that when the key D is depressed in error by the pupil, the key D on the master piano has not been depressed; hence the contacts 4 and 4a which cooperate therewith are closed, and when the pupil depresses the key D the cooperating contacts 7 and 7a are closed. The circuit can be

traced as follows: Commencing with battery 10, the current passes through wire 9, lamp 21, bar 8, contacts 7a and 7, wire 16a and wire 16, contacts 4 and 4a, bar 11, switch 20, and wire 12, back to the battery, thus closing the circuit through light 21 to indicate the error. On the other hand, if the pupil had correctly depressed the key of C, the circuit through the light 21 could not be closed, as the circuit would be broken by the separation of the cooperating contacts 4 and 4a actuated by the depressed key of C on the master piano. If the key of C is correctly depressed by the pupil, but ahead of turn, the light 21 will appear as the contacts 4 and 4a actuated by the key of C on the master piano have not been separated; similarly, if the key of C is correctly depressed by the pupil but is held too long, the light 21 will again appear, as the teacher will have released the key of C, thereby permitting the contacts 4 and 4a to close. If two or more keys are depressed by the teacher on the master piano, and the same keys are depressed by the pupil, no light will appear, but if one or more of the keys depressed by the pupil are wrong, the light will appear, as keys corresponding to the wrong keys have not been depressed on the master piano, and the circuit through the error-indicating light will accordingly appear. By this method only one error-indicating light is required on each pupil's piano, as by properly positioning the same, the teacher can instantly detect which one of the pupils, if any, is making mistakes; and so can the particular pupil who is making the mistakes.

The wiring system employed is exceedingly simple, and as such may be on dummy keyboards and standard pianos, the latter being preferred, as sounding of the note played is desirable to permit the teaching of pitch correlation. Also, by using standard pianos, kinaesthetic adjustments for sight and muscle usage can at the same time be developed; and as any number of pupils' pianos, as required, may be employed, group activity is insured, and all pupils are actively engaged. While the error detecting system is rather specifically illustrated and described, I nevertheless wish it understood that changes may be resorted to within the scope of the appended claims; similarly, that the materials and finish of the various parts employed may be such as the maker desires.

I claim—

1. In an apparatus of the character described, a master piano and a pupil's piano, each piano having keys which are adapted to be depressed and both pianos adapted to be played in unison, a contact member on each key of the master piano, a stationary cooperating contact for each key of the master piano, said contacts being closed when the keys assume normal position, a contact on each key of the pupil's piano, a stationary cooperating contact for each key of the pupil's piano, said contacts being open when the keys assume normal position, a source of current supply, one side of said supply being connected with all of the stationary contacts on the master piano, and the other side of said supply being connected with all the stationary contacts on the pupil's piano, a wire for each key of the master piano and connected with the contacts carried thereby, the opposite ends of said wires being connected with the contacts of identical keys on the pupil's piano, and an electric light in the side of the circuit which is connected with the stationary contacts on the pupil's piano, the circuit through said light being normally open and remaining open if identical keys are depressed on both pianos, but said circuit being closed if unlike keys are depressed.

2. In an apparatus of the character described, a master piano, a plurality of pupils' pianos, all of said pianos having depressible keys and mechanism connected with the keys of all of said pianos and including an error indicator on each pupil's piano, devices operated by the keys of the pupils' pianos for causing said mechanism to operate the error indicators, and devices operated by the keys of the master piano to cause the said mechanism to render inoperative the error indicators when the depressed keys of the pupils' pianos correspond with the keys simultaneously depressed on the master piano.

3. In an apparatus of the character described, a master piano, a plurality of pupils' pianos, all of said pianos having depressible keys, an electric circuit including an electrically operated error indicator on each pupil's piano, normally open contacts in said circuit arranged to be closed by depressing the keys of the pupils' pianos, and normally closed contacts in said circuit arranged to be opened by depressing the keys of the master piano, whereby when identical keys of the master piano and the pupils' pianos are simultaneously depressed there will be no operation of the error indicator but there will be an operation of the error indicator by the depression of a key of the pupils' pianos not identical with a simultaneously depressed key of the master piano.

4. In an apparatus of the character described, a master piano, a plurality of pupils' pianos, all of said pianos having depressible keys, an electric circuit including an electric light on each pupil's piano, normally open contacts in said circuit arranged to be closed by depressing the keys of the pupils' pianos, and normally closed contacts in said circuit arranged to be opened by depressing the keys of the master piano, whereby the electric light will be lighted by the depression of a key of a pupil's piano when the corresponding key of the master piano is not simultaneously depressed and will not be lighted when a key of a pupil's piano is depressed simultaneously with the identical key of the master piano.

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