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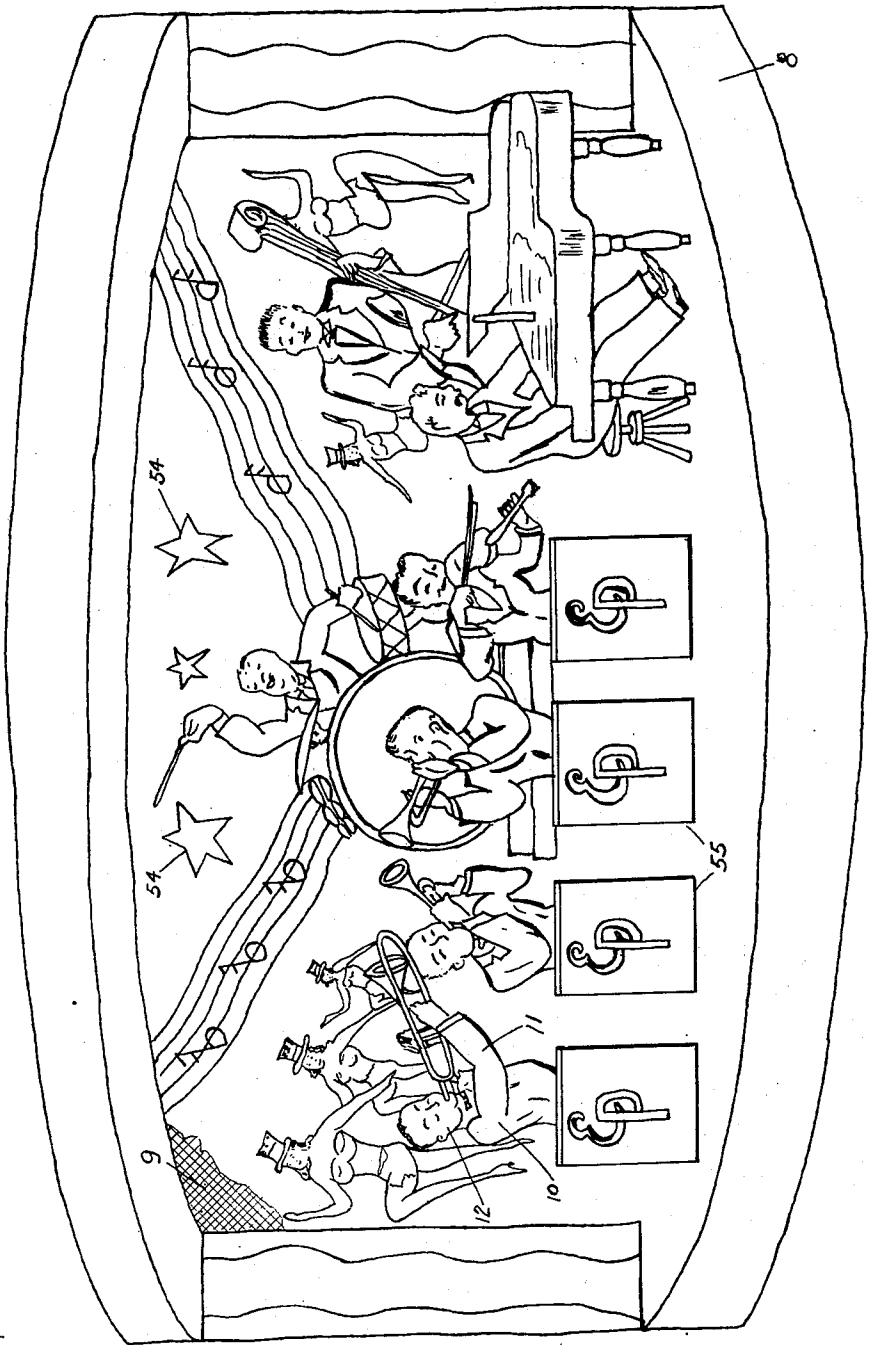
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ORCHESTRAL APPARATUS

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Fig. 1



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ORCHESTRAL APPARATUS

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6 Claims. (Cl. 46—118)

My invention relates to the use with electro-mechanical sound reproducing apparatus of automaton and lighting effects, whereby there will be similarity to an orchestra produced in connection with the sound reproducing apparatus.

One object of my invention is to provide an improved form of orchestral apparatus wherein automaton representing musicians of an orchestra will have movements imparted thereto simulating movements of orchestra players, and wherein the stage lighting and movements of the automaton will be automatically effected and controlled in an improved manner, in conjunction with the electro-mechanical reproduction of music.

In the accompanying drawings, Figure 1 represents a front view of a stage containing an orchestra; Fig. 2 is a vertical sectional view showing the gearing and driving mechanism for moving the arms and heads of the automaton; Fig. 3 is a sectional plan view of a portion of the apparatus of Fig. 2; Fig. 4 is a view showing the manner in which the mechanism of Figs. 2 and 3 may be employed in operating the arms of the automaton; Fig. 5 is a view showing the manner in which the driving mechanism of Fig. 2 can be employed for operating the arms of a piano player; Fig. 6 is a vertical sectional view of a portion of the apparatus of Fig. 5; and Fig. 7 is a diagrammatic view showing the manner in which the various parts of the orchestral apparatus are arranged and electrically connected.

The orchestra stage is represented by the numeral 8 and is preferably provided with a screen or curtain 9 of gauze material which is disposed across the front of the stage and in front of the orchestra. The gauze screen is of a material through which the orchestra can be seen when the stage is illuminated at the rear side of the curtain, but which will present an unbroken appearance when illuminated only at the front. The automaton which represent the orchestra players and which may be of approximately life size or can be made in miniature, have certain of their parts movable. Thus, the trombone player 10 will have one of his arms 11 jointed for reciprocation, as hereinafter described, to reciprocate the slide of his trombone. His head 12 will be pivotally supported for oscillatory movements by mechanism to be hereinafter described. Similarly, the bow arm of the violin player and the arms of the drummer will be jointed for movements by the mechanism, as will also their heads.

As shown more particularly in Fig. 2, a gear

14 is mounted within the body of each player whose arms or head or both are to be moved. The gear case is concealed by the clothing of the automaton. An electric motor 15 is mounted in each gear case and has a worm 16 formed on its shaft that meshes with a worm wheel 17 which is secured to a shaft 18. The shaft 18 carries a crank disc 19 at its upper end and has pivotal connection at 20 with a link 21. The link 21 is in turn pivotally connected to a lever 22 that is pivotally mounted on a fixed axis 23, within the body of the automaton, one side of the gear case 14 being open to permit the lever 22 to project therethrough. The outer end of the lever 22 is pivotally connected to an arm portion 24 of an automaton, such portion 24 being rigidly connected to a forearm portion 25. The parts 24 and 25 are normally rigid with respect to one another, but may be relatively adjusted at 26 to provide for the proper angularity of the forearm 25, in accordance with the character of instrument which the automaton has. Such instrument can be a violin bow, the slide of a trombone, a drum stick etc. It will be seen that as the shaft 18 is driven by the motor, the arm of the automaton will be reciprocated.

The shaft 18 carries a pinion 27 that meshes with a gear wheel 28 which is mounted on a shaft 29. At its upper end, the shaft carries a crank disc 30 that is provided with a pin or stud 31 which extends through a slot formed in a lever 32. The lever 32 is rigidly connected to a vertical shaft or spindle 33 upon whose upper end is mounted the head of an automaton. The gear reduction at 27—28 is such that the head of the automaton will be oscillated slowly relative to the rate at which the arm lever is oscillated.

In Figs. 5 and 6 I show an arrangement for operating the arms of the piano player. In this structure a lever 35 is mounted within the shoulders of the player on a fixed pivot 36 and the lever can be rigidly connected at one end to one of the vertical shafts 33, so that the lever 35 will be oscillated about its pivot 36. The laterally-extending arms of the lever 35 are pivotally connected to arm members 38 that are mounted upon fixed pivots 39 in the shoulders of the piano player. The hands 40 of the piano player have guide rollers 41 yieldably or flexibly connected thereto by springs 42, through the medium of a spacer bar 41a on which the rollers are journaled. The rollers 41 are contained within a slotted guide rail 43 that is positioned above the keyboard of the piano. The hands of the piano

player are thereby supported and guided during oscillation of his arms along the keyboard.

In Fig. 7 I indicate a switch box 45 that may suitably be of the coin-operated type and a reproducer 46 for playing recordings. Also I show an amplifier 47 and a loud speaker 48. These members 45, 46, 47 and 48 may be of various well-known conventional forms. Thus when the switch 45 is operated to close the circuit, the reproducer is automatically set into motion to play a record, and the sound impulses are amplified at 47 and sound emitted from the loud speaker 48. As is common in devices of this character, the circuit can automatically be broken when a record has been played, and the apparatus can be again set in motion by inserting a coin in the box 45 or by otherwise reclosing the circuit. The loud speaker 48 can suitably be positioned in the bass drum, which may have a foraminous front wall or head to permit passage of the sound. Other loud speakers can be placed behind the screens or tables 55 that are located in front of some of the players. The reproducer and amplifier may be placed back-stage or in any other suitable location, and switches or coin boxes 45 can be located at suitable points in the auditorium.

An electromagnet 49 is provided for closing a switch 50 that is normally held open by a tension spring 51. The switch 50 controls an electrical circuit 52 which may suitably be an ordinary house lighting circuit. The various motors 15 which operate the automatons are connected in the circuit 52 and are hence controlled by movements of the switch 50. Similarly, lamps 53 are connected in the circuit 52 and controlled by the switch 50. These lamps are disposed in the rear of the curtain 9 and may be positioned as foot lamps and behind representations of stars 54.

It will be seen that on first view the stage behind the curtain or screen 9 will not be visible. However, when the electro-mechanical reproducing apparatus is set into operation, the electromagnet 49 will automatically be energized to close the switch 50 and thus initiate movement of the motors 15 and illumination of the lamps 53 simultaneously with the energizing of the sound reproducing apparatus. When a recording has been played and the circuit in the reproducer broken, the solenoid 49 will simultaneously be de-energized to permit the switch 50 to be opened by its spring 51, thus also de-energizing the motors 15 and the lamps 53.

By reason of these interrelated operations, and also because the orchestra is not visible through the screen 9 when no music is being played, the illusion of a real orchestra is more pronounced than if the orchestra were constantly visible to the audience, or if the sound reproducer and movements of the figures were set into operation in sequence instead of simultaneously. Also, the gauze curtain serves to largely eliminate the artificial appearance of the automatons. It has been found that with only three or four actual

orchestra-men on the stage, in front of the gauze curtain, and a number of automatons back of the curtain and under illumination, the resemblance to a live full orchestra is remarkable. The live members of the orchestra will play as accompanists or supplemental to the mechanically reproduced music.

I claim as my invention:

1. Orchestral apparatus comprising an electro-mechanical sound reproducer, automaton musicians, electric motors of the rotor type, driving connections between each motor and a movable part of each automaton, for actuating said part, a power circuit for the motors, independent of the circuit for the reproducer, and means operable upon making and breaking of the reproducer circuit, to make and break the said power circuit.

2. Orchestral apparatus comprising an electro-mechanical sound reproducer, an automaton musician, an electric motor of the rotor type, operating connections between the motor and the head and an arm of the automaton, a power circuit for the motor, independent of the circuit for the reproducer and means operable upon making and breaking of the reproducer circuit, to make and break the said power circuit.

3. Orchestral apparatus comprising an electro-mechanical sound reproducer, automaton musicians, an electric motor of the rotor type in each automaton, driving connections between each motor and a movable part of each automaton, for actuating said part, a power circuit for the motors, independent of the circuit for the reproducer, and a single control device for making and breaking the said circuits.

4. Orchestral apparatus comprising an electro-mechanical sound reproducer, a stage having a gauze screen at the front thereof, lamps behind said screen, automaton musicians behind the screen, electric motors of the rotor type, driving connections between each motor and a movable part of each automaton, for actuating said part, a power circuit for the motors and the lamps, independent of the circuit for the reproducer, and means operable upon making and breaking of the reproducer circuit, to make and break the said power circuit.

5. Orchestral apparatus comprising a sound reproducer, an automaton musician, an electric motor of the rotor type, operating connections between the motor and the head and an arm of the automaton, a power circuit for the motor independent of the reproducer, and means operable upon starting and stopping the reproducer to make and break the said power circuit.

6. Orchestral apparatus comprising a sound reproducer, an automaton musician, an electric motor, operating connections between the motor and a movable part of the automaton, an electrical circuit for the motor independent of the reproducer, and means operable upon starting and stopping the reproducer to make and break the said circuit.

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