Nov. 17, 1959 F. HESS 2,912,894

MULTIPLE INSTRUMENT PLAYING DEVICE

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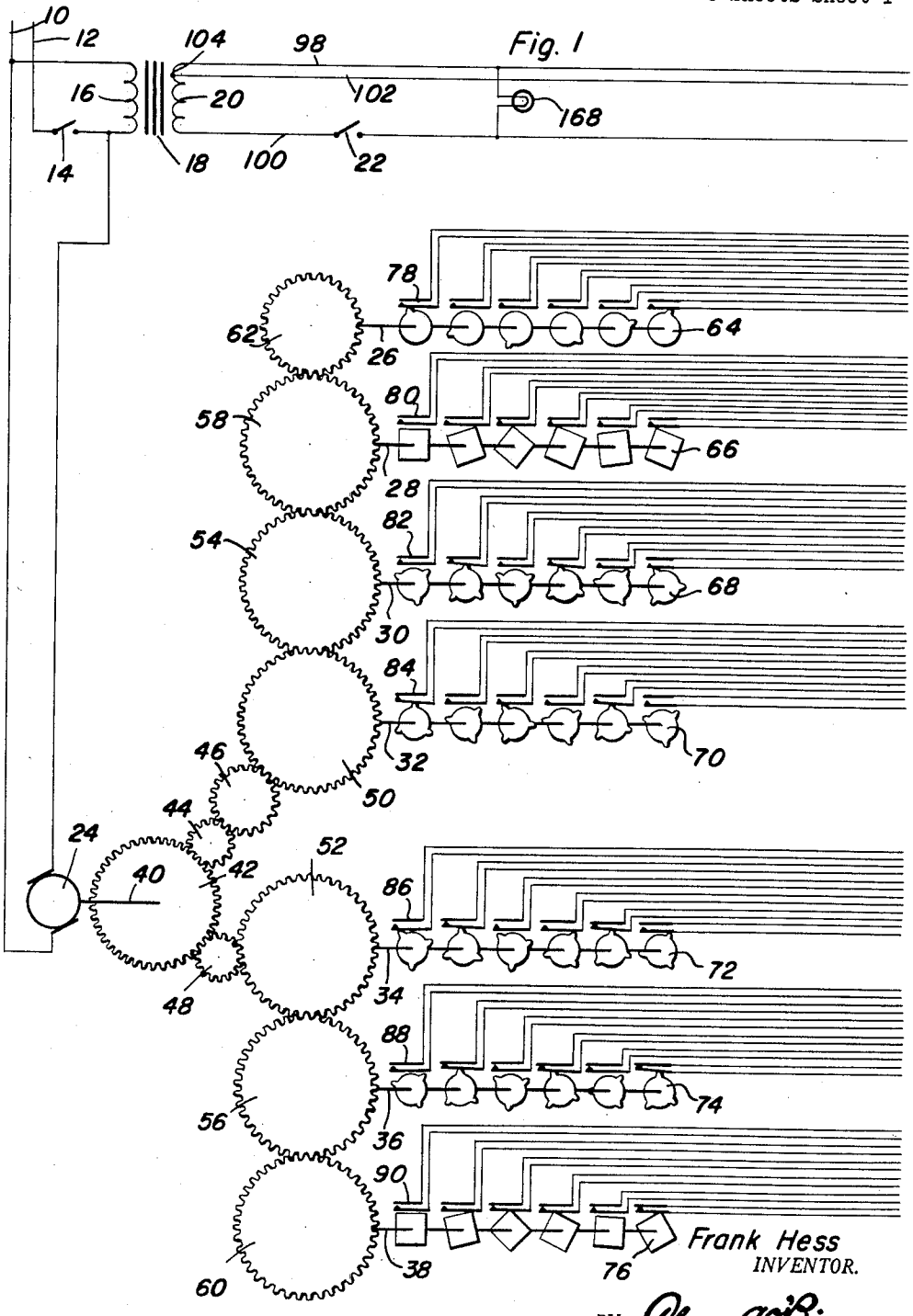
Fig. 1



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MULTIPLE INSTRUMENT PLAYING DEVICE

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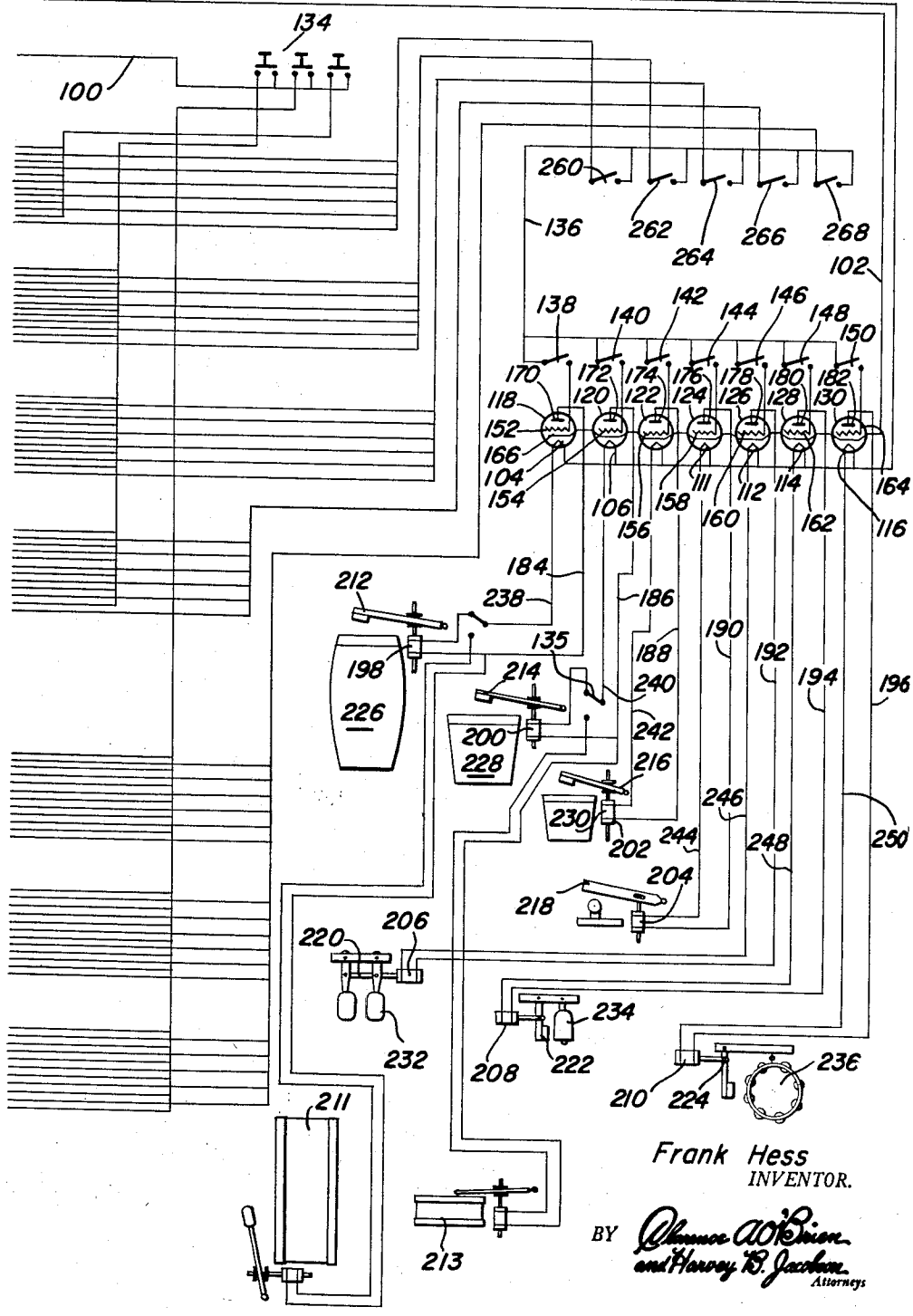
Fig. 1a



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MULTIPLE INSTRUMENT PLAYING DEVICE

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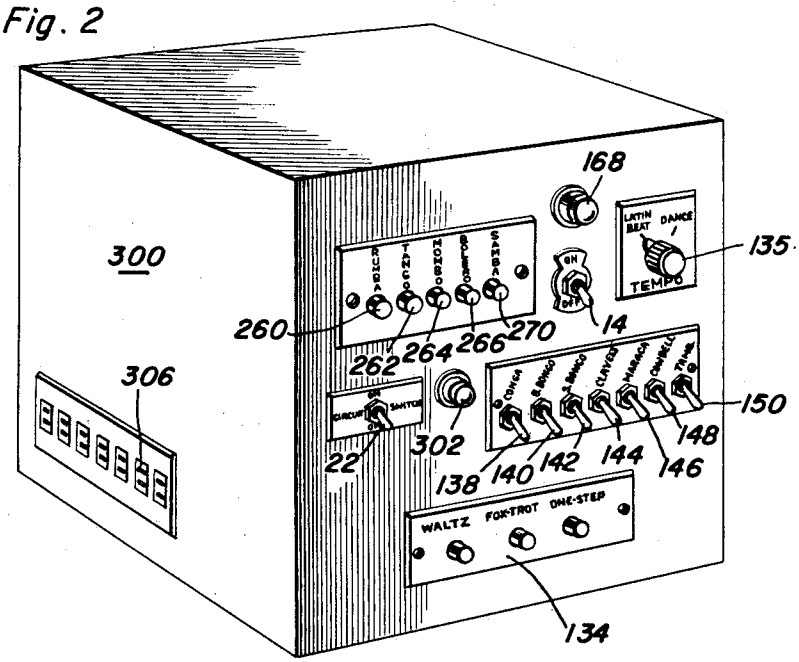
Fig. 2



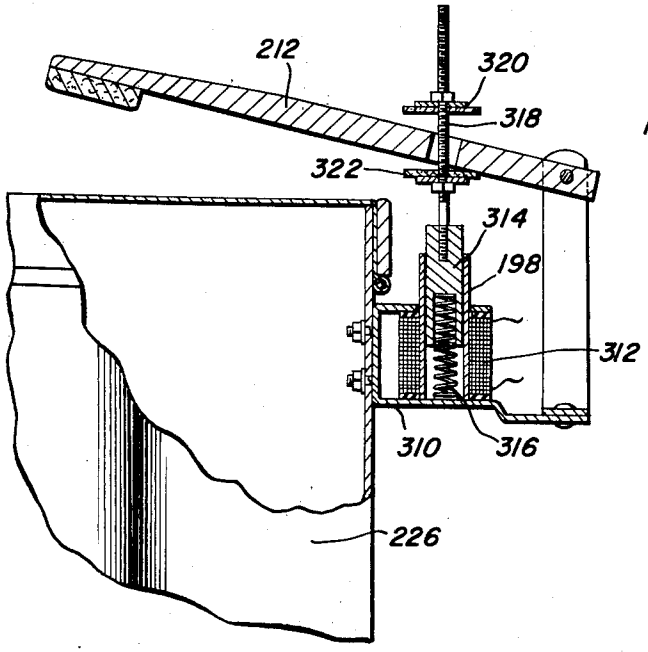


Fig. 7

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MULTIPLE INSTRUMENT PLAYING DEVICE

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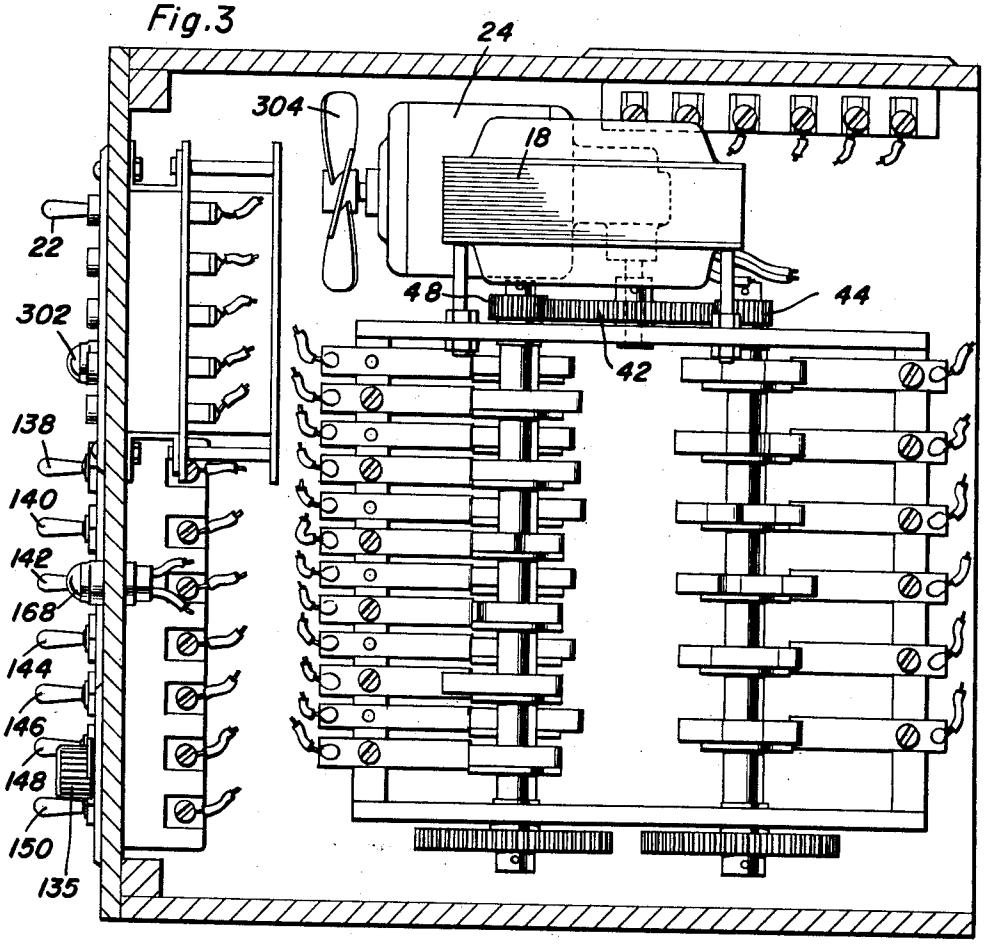
Fig. 3



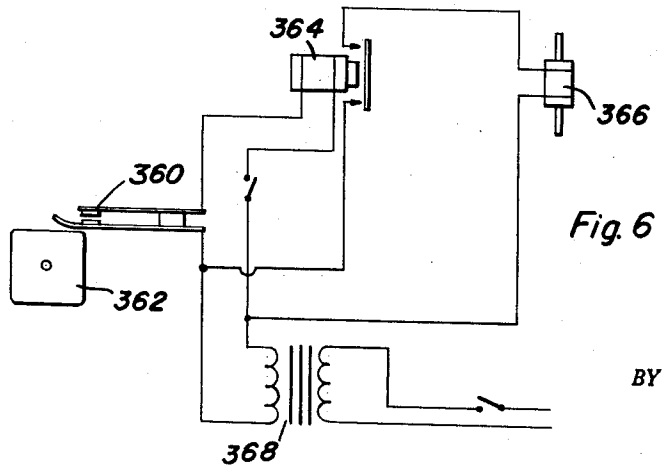


Fig. 6

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MULTIPLE INSTRUMENT PLAYING DEVICE

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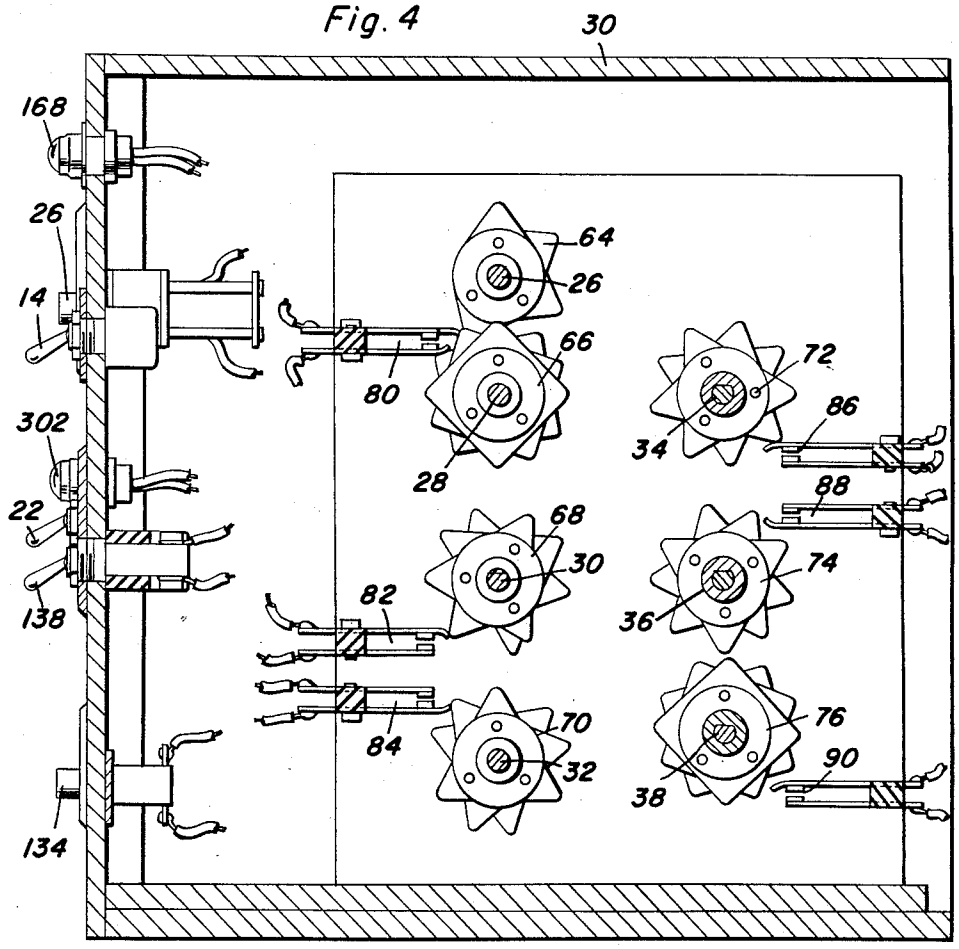
Fig. 4



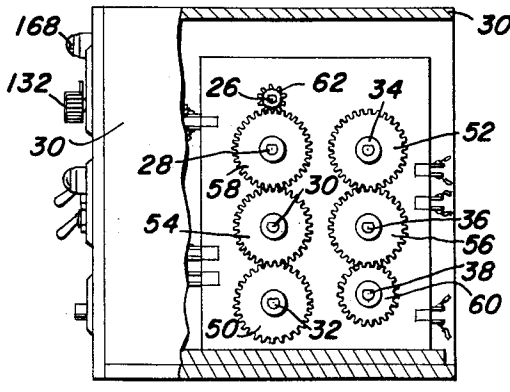


Fig. 5

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2,912,894

MULTIPLE INSTRUMENT PLAYING DEVICE

Frank Hess, Indianapolis, Ind.

Application May 20, 1957, Serial No. 660,345

7 Claims. (Cl. 84—171)

This invention relates to an electrical musical combination instrument and more particularly to a multiple instrument playing arrangement whereby a number of drums and other instruments can be played.

The concept of this invention features an arrangement of parts whereby a number of musical instruments can be played at various tempos and rhythms. Thus, various types of musical compositions can be played at various tempos.

A further object of the present invention resides in the provision of an electrical musical instrument flexible enough to play various types of Latin American rhythms while being equally adaptable for use in playing other types of musical works.

Still further objects and features of this invention reside in the provision of an electrical musical instrument that is easy to operate, efficient in use, and which employs simple circuit arrangements thereby being substantially foolproof.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this electrical musical instrument, preferred arrangements of parts being shown in the accompanying drawings, by way of example only, wherein:

Figures 1 and 1A are schematic wiring diagrams of a preferred embodiment of the invention;

Figure 2 is a perspective view illustrating the housing in which the major control portions of the invention are mounted illustrating the simplicity of the controls for the invention;

Figure 3 is a horizontal sectional view in an enlarged scale of the housing and illustrating the interior thereof and the various cams utilized in the invention for holding the rhythm contacts;

Figure 4 is a vertical sectional view in an enlarged scale illustrating the construction of the cam components in the interior of the housing in detail;

Figure 5 is an elevational view in a reduced scale with a portion of the housing broken away illustrating gear arrangements in the invention;

Figure 6 is a schematic wiring diagram of an alternate arrangement employing a magnetic relay in view of a thyratron tube for controlling the energization of the electro-magnetic means for actuating the striker of each instrument; and

Figure 7 is a detailed diagram of the electro-magnetic means utilized for actuating the striker of one of the instruments.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, and with initial attention directed to Figures 1 and 1A, reference numerals **10** and **12** generally designate the supply lines connected to a source of electrical power. A master control switch **14** controls the supply of electrical current to the primary **16** of a transformer **18** having a secondary **20**. A secondary control switch **22** is provided for controlling the supply of electrical power to the musical instrument utilized in the invention.

By means of an electric drive motor **24**, a plurality of drive shafts **26, 28, 30, 32, 34, 36**, and **38** are driven. The drive motor drives a motor shaft **40** which in turn drives a gear **42** and through any suitable gearing arrangement such as that shown best in Figure 1, through gears such as indicated at **44, 46, 48**, the gears **50** and **52** are respectively driven. These gears are interengaged with other gears **54, 56** which are in turn engaged by gears **58** and **60**, the gear **58** being meshed with gear **62**. The shafts are connected to the gears and are therefore driven at different relative rates.

Mounted on the shafts **26** through **38**, are sets of cams **64, 66, 68, 70, 72, 74**, and **76**, there being any suitable number of cams and each of the cams is provided with a pair of contacts, the contacts being arranged in pairs as indicated at **78, 80, 82, 84, 86, 88**, and **90**.

Connected to the secondary **20** of the transformer **18** are conductors **98** and **100** as well as conductor **102** connected to a tap **104** on the secondary **20**. Connected to the conductor **98** are the cathodes **105, 106, 108, 110, 112, 114, 116** of thyratron tubes **118, 120, 122, 124, 126, 128**, and **130**. Conductor **100** has connected thereto the movable contact **132** of a three position push button type switch **134** so arranged as to control the cam connections operative through the common conductor **136** through switches **138, 140, 142, 144, 146, 148** and **150**. Connected to the switches **138**, etc., are the grids **152, 154, 156, 158, 160, 162** and **164** of the tubes **118**, etc. Each of the tubes **118**, etc., have grids as at **166** for tube **118**, connected to a common conductor **102** for receiving a low voltage potential continuously even though the switches **138, 140**, etc., are open. An indicator lamp **168** is connected across conductors **98** and **100** to show that switch **22** is either in an opened or closed position.

Connected to the plates **170, 172, 174, 176, 178, 180** and **182** of the tubes **118**, etc., are conductors **184, 186, 188, 190, 192, 194**, and **196**, leading to the electro-magnetic means **198, 200, 202, 204, 206, 208**, and **210** for actuating the strikers **212, 214, 216, 218, 220, 222** and **224** of the conga drum **226**, the big bongo drum **228**, the small bongo drum **230**, the marracas **232**, the cowbell **234**, and the tambourine **236**. The electro-magnetic means **198, 200**, etc., are connected through conductors **238, 240, 242, 244, 246, 248** and **250** to the cathodes **105, 106**, etc., of the thyratron tubes. These thyratron tubes are preferably of a type No. 885 and are arranged to fire when there is a potential on the grids **152, 154**, etc.

Controlling the supply of electrical current to the common conductor **136** are a plurality of rhythm switches **260, 262, 264, 266**, and **268**, for controlling rumba, tango, mombo, balero and samba type rhythm cams, it being noted that when switch **260**, for example, is closed, only the rhythm caused by the opening and closing of the sets of contacts **78** will control the supply of electrical current to the common conductor **136** and hence to the switches **138**, etc., and then to the grids **152**, etc., controlling the supply of electrical current to the electro-magnetic striker operating mechanism **198**, etc.

It is noted that the cams and other control mechanisms including the switches may be mounted in or on a suitable housing **300** of any desired shape. In addition to the indicator light **168** a power light **302** may be connected across a source of electrical power for indicating whether the device is receiving power. The motor **24** may drive a cooling fan **304**. It is noted that suitable

plug-in sockets as indicated at **306** may be provided for simplifying the electrical connections.

As can be seen best in Figure 7, the electro-magnetic means such as the electro-magnetic means **198** for actuating the conga drum or other electrical musical instrument may be mounted by means of a suitable bracket **310** adjacent the drum and includes a coil **312** for actuating an armature **314** spring pressed by means of a spring **316** into an initial position. Upon excitation of the coil **312**, the armature **314** is drawn toward the drum, pulling down on the adjusted threaded rod **318**, which in turn causes the striker **212** to strike the drum. Suitable stops **320** and **322** can be provided for adjusting the position of the striker **212** to gain the best effect. Of course, other types of striker arrangements may be contemplated for use in conjunction with the invention. In Figure 5, there is shown the gearing arrangement which can be used in conjunction with the invention, the gear assemblies being clearly visible.

Referring now to the arrangement of parts as shown in Figure 6, it will be noted that the contacts such as are indicated generally at **360** can be opened or closed by means of the operation of cam **362**. The cam controls the flow of electrical power to a relay **364** utilized in lieu of the thyratrons **118**, etc. Thus, the contacts **360** control the flow of electrical power to the relay **360** which in turn controls flow of current to the electro-magnetic means for actuating the striker as indicated at **366**. Of course, the relay **364** needs far less current for actuation thereof than the electro-magnetic means **366** and therefore the thyratron tubes **118**, etc., are far more efficient and more accurate in use than the mechanical relays. The transformer generally indicated at **368** serves the purpose of the transformer **18**.

This invention enables a musician to get a uniform Latin rhythm beat of varying tempo for the rhumba, samba, conga, mambo, and other Latin rhythms simply by adjusting the feed selector switch **134** and the switches **260**, **262**, etc. to the tempo desired. The beat can be further modified by adjusting the positioning of the dance tempo switch **134** controlling the various cams. Then, by closing the switches **138**, **140**, etc., as desired, the instruments to be utilized in obtaining the desired rhythm can be employed.

Dance tempo switch **135** provides means for alternately connecting a big bass drum **211** and a snare trap drum **213** in lieu of the conga drum and the big bongo drum when the invention is not being used for Latin rhythms.

It is to be understood that this invention is equally adaptable for use in other types of rhythms and for actuating other instruments. Further, since numerous modifications will readily occur to those skilled in the art, it is not intended to limit the invention to the precise embodiments shown and described, but all suitable modifications and equivalents may be readily resorted to, which fall within the scope of the appended claims.

What is claimed as new is as follows:

1. An electrical musical combination comprising a plurality of musical instruments, strikers for said musical instruments associated therewith, electro-magnetic means for actuating said strikers connected to said strikers, cam switch means for exciting said electro-magnetic means connected thereto for actuating selected of said strikers at a selected rhythm, a source of electrical power, a plurality of instrument switches connected between said source of electrical power and said electro-magnetic means for selecting a striker, and rhythm switches connected between said cam switch means and said instrument switches for selecting the rhythm to be applied to said strikers.

2. An electrical musical combination comprising a plurality of musical instruments, strikers for said musical instruments associated therewith, electro-magnetic means for actuating said strikers connected to said strikers, cam switch means for selectively exciting said electro-magnetic means connected thereto for actuating selected of said strikers at a selected rhythm, a source of electrical power, and a plurality of instrument switches connected between said source of electrical power and said electro-magnetic means for selecting a striker, said cam means including a drive motor electrically connected to said source of electrical power, drive shafts connected to and driven by said motor, a plurality of sets of cams mounted on said shafts, a plurality of pairs of contacts opened and closed by said cams, and a set of switches, each switch of said set of switches having the contacts operated by one set of cams of said plurality of sets of cams electrically connected in series connection therewith.

3. An electrical musical combination comprising a plurality of musical instruments, strikers for said musical instruments associated therewith, electro-magnetic means for actuating said strikers connected to said strikers, cam switch means for selectively exciting said electro-magnetic means connected thereto for actuating selected of said strikers at a selected rhythm, a source of electrical power, and a plurality of instrument switches connected between said source of electrical power and said electro-magnetic means for selecting a striker, said cam means including power, drive shafts connected to and driven by said motor, a plurality of sets of cams mounted on said shafts, a plurality of pairs of contacts opened and closed by said cams, and a set of switches, each switch of said set of switches having the contacts operated by one set of cams of said plurality of sets of cams electrically connected in series connection therewith, and means connecting said shafts to said motor for driving said shafts at varying rates.

4. An electrical musical system for playing a number of musical instruments at various rhythmic rates comprising a source of potential, electromagnetic means operatively associated with each musical instrument for playing it, switch means including individual switches operable to open and close at different fixed rhythmic rates, selector switches coupled between said source and said individual switches and selectively operable to connect said individual switches to said source, instrument switches coupled to each instrument operating electromagnetic means for selecting instruments to be played, and rhythm switches coupled between said individual switches and said instrument switches for connecting different ones of said individual switches to said instrument switches for selecting different rhythms for playing said instruments.

5. An electrical musical system for playing a number of musical instruments at various rhythmic rates comprising a source of potential, electromagnetic means operatively associated with each musical instrument for playing it, switch means coupled to said source and including individual switches operable to open and close at different fixed rhythmic rates, instrument switches coupled to each instrument operating electromagnetic means for selecting instruments to be played, and rhythm switches coupled between said individual switches and said instrument switches for connecting different ones of said individual switches to said instrument switches for selecting different rhythms for playing said instruments.

6. An electrical musical system for playing a number of musical instruments at various rhythmic rates comprising a source of potential, electrical means operatively associated with each musical instrument for playing it, means coupled to said source for generating pulses at different fixed rhythmic rates, instrument switches coupled to each instrument operating electrical means for selecting instruments to be played, and rhythm switches coupled between said generating means and said instrument switches for selecting different rhythms for playing said instruments.

7. An electrical musical system for playing a musical instrument at various rhythmic rates comprising a source of potential, electrical means operatively associated with said instrument for playing it, means coupled to said source for generating pulses at different fixed rhythmic rates, and rhythm switches coupled between said generating means and said instrument playing means for selecting different rhythms for playing said instrument.

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