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ADJUSTABLE FRICTION DRIVE

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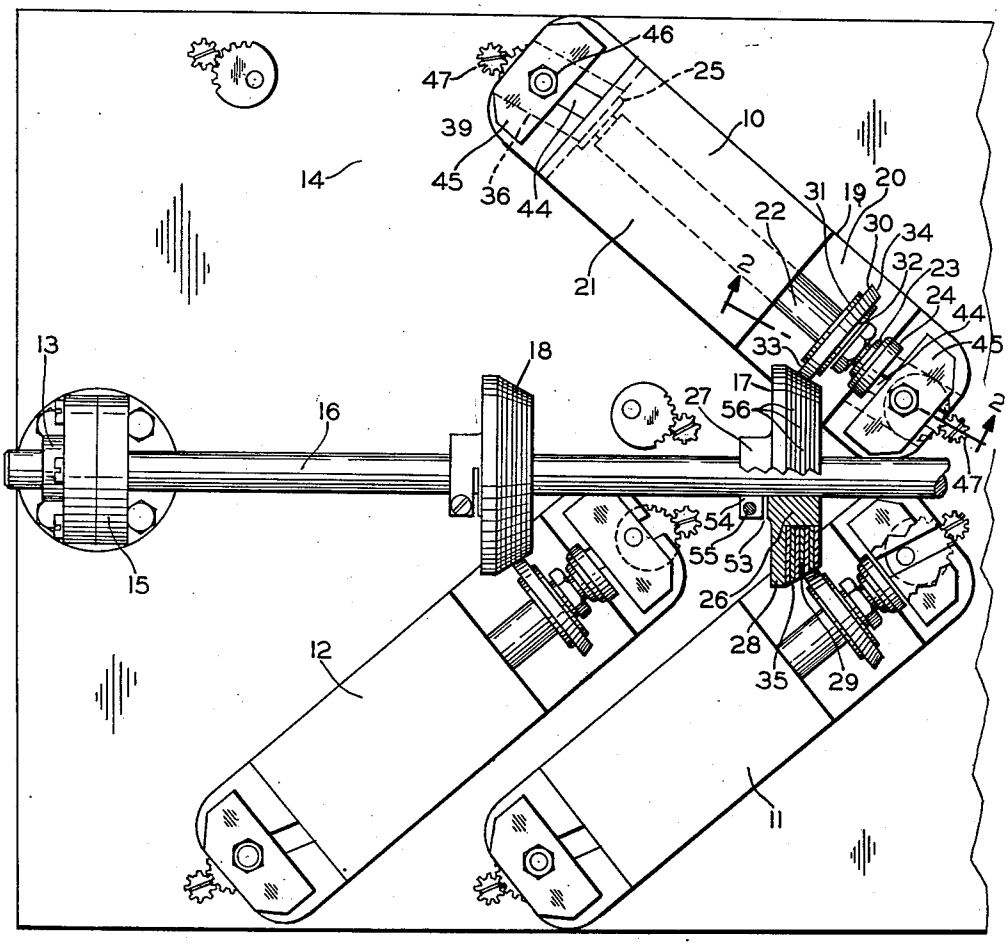


FIG 1

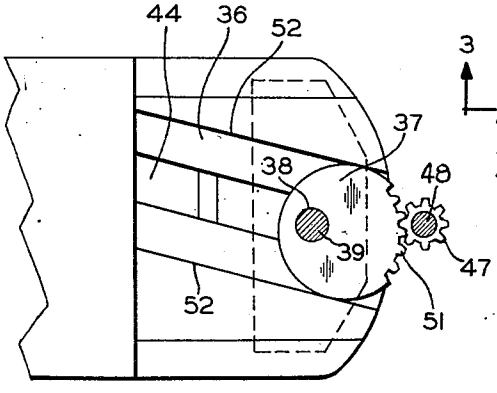


FIG 3

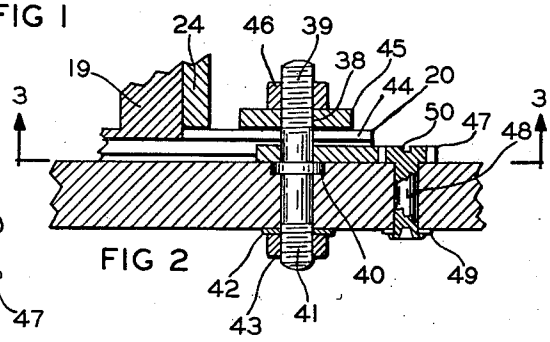


FIG 2

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ADJUSTABLE FRICTION DRIVE

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5 Claims. (Cl. 74—191)

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The herein disclosed invention relates to electric organs and particularly to the type of organ having a number of tone generators each provided with a driven shaft, operated from a common driving shaft.

An object of the invention resides in providing a drive for the tone generator by means of which the speed of the driven shaft may be easily and accurately adjusted.

Another object of the invention resides in using a driven wheel and a driving wheel having contacting surfaces for effecting the drive and in constructing one wheel with a tire of rubber or some other similar material having a flexible surface and the other wheel from wood having end grain exposed at its surface.

A still further object of the invention resides in arranging the driving and driven shafts at an angle and in forming the contacting surfaces of said wheels conical.

An object of the invention resides in providing separate frames for certain tone generators or groups of generators mounted on a support carrying the driving shaft and in guiding said frames for movement in the direction of extent of the line of contact of the conical surfaces of said wheels.

Another object of the invention resides in constructing said frames with bases having grooves therein forming guideways extending in the direction of the line of contact of the conical surfaces of said wheels.

A still further object of the invention resides in utilizing eccentrics rotatably mounted on the support and engaging the guideways, said eccentrics forming guide members for guiding the frame for movement along the guideways and when rotated moving the frame transversely of the guideways.

A feature of the invention resides in providing locking means for holding the frames in adjusted position.

Other objects of the invention reside in the normal combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawings:

Fig. 1 is a plan view of a portion of a musical instrument illustrating an embodiment of the invention applied thereto.

Fig. 2 is an elevational sectional view taken on line 2—2 of Fig. 1 and drawn to a greater scale.

Fig. 3 is an inverted sectional view taken in line 3—3 of Fig. 2.

The structure disclosed consists of a support

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in the form of a board and on which are mounted bearings rotatably supporting a driving shaft. Collars on the said shaft hold the same from endwise movement. Along the shaft are disposed a number of tone generators such as disclosed in the patent to John C. N. Richards No. 2,130,251, issued September 13, 1938. Certain of said generators are mounted on a frame which rotatably supports a driven shaft also held from endwise movement. These frames are all constructed alike and are all arranged so that the driven shafts thereof make an angle with the driving shaft. On each driven shaft is a driven wheel having a rubber tire formed with a conical driven surface. At appropriate positions on the driving shaft are a number of driving wheels each constructed partly of wood and having conical driving surfaces with exposed end grain and adapted to engage the conical surfaces of the driven wheels to drive said tone generators. Each frame is formed with a base having two slots therein and forming guideways running substantially parallel to the line of contact of said conical surfaces. Mounted for rotation on studs secured to the support are eccentrics received in said grooves and which form guide members for guiding the frames for movement in the direction of the lines of contact of said conical surfaces. These eccentrics, however, on rotation move the frames laterally of the guideways to adjust the pressure between the driving and driven wheels. Clamp bars mounted on said studs engage the upper portions of said bases and nuts on said studs engage said clamp bars and clamp the frames in adjusted position.

For the purpose of illustrating the invention a portion of an electric organ has been shown which consists of a number of tone generators such as disclosed in the above noted patent and which may be mounted and driven singly or in groups. Since these tone generators form no particular feature of the invention the same have not been shown in detail and will be referred to in the singular though many such tone generators may be mounted on a single frame and driven by a single driven shaft.

In the drawings, a number of tone generators 10, 11 and 12 have been shown which are supported and driven in the same manner. For this reason only the drive for the tone generator 10 which will be described in detail.

The various tone generators of the organ are mounted on a support 14 which is in the form of a board or plate constructed of some suitable rigid material such as a phenolic board or of

metal. Mounted on the support 14 are two bearings, one of which is illustrated in Fig. 1 and indicated at 15. These bearings rotatably support a shaft 16. The shaft 16 is driven by an electric motor not shown and will be referred to as the driving shaft. On this shaft is mounted a number of driving wheels, two of which are shown and numbered 17 and 18. These driving wheels drive the various tone generators 10, 11 and 12, as will be presently described. Collars are mounted on the shaft 16 and engage the bearings thereof to prevent endwise movement of said shaft. One of these collars is designated by the reference numeral 13 in Fig. 1.

The tone generator 10 consists of a frame 19 constructed of metal and having a base 20 projecting outwardly beyond the generator proper. The generator further includes various individual tone generators which are diagrammatically indicated in block form at 21. All of these generators are driven by a driven shaft 22, which is journalled in a bearing 23 carried by a standard 24, extending upwardly from the base 20. The said shaft is further journalled in another bearing 25 carried by the frame 19 and disposed at the opposite end thereof. The shaft 22 is held from endwise movement by means of the bearings 23 and 25. As will be noted in Fig. 1 the shaft 22 is angularly disposed with reference to the shaft 16. The drive wheel 17 comprises a wheel center 26 which consists of a hub 27 having a flange 28 extending outwardly therefrom. This hub is partly separated from the flange 28 by means of a slit 53 and is formed with an axially extending slot 50. A bolt 55 extending through the parts on each side of the slot 54 clamps the wheel center 28 in place on the shaft 16. On the flange 28 is mounted a tire 29 which is constructed of plywood and which is arranged with the plies 56 thereof parallel to the flange 28. The alternate plies are disposed with the grain at right angles to the adjoining plies. Driving wheel 17 drives a driven wheel 30 on the shaft 22. This wheel consists of a wheel center 31 mounted on said shaft and having a groove 32 in the periphery thereof. In this groove is disposed a rubber tire 33 which has a conical surface 34 adapted to engage a conical surface 35 on the tire 29 of wheel 17. It will be noted that the surface 35 of tire 29 is of considerably greater axial extent than the surface 34 of tire 33. The plies 56 of the tire 29 are of a width less than the width of the surface 34 of tire 33. With the construction shown the plies are so disposed that end grain of the wood from which the plies are constructed is at all times in contact with the surface 34 of the tire 29.

For supporting the frame 19 the base 20 is constructed on the under side thereof and at each end with grooves 36. These grooves are parallel with one another and extend substantially in directions parallel with the direction of extent of the line of contact of the two conical surfaces 34 and 35. In these grooves are mounted eccentric discs 37, best shown in Fig. 3 and which have holes 38 in the same. These discs are mounted on studs 39 secured to the support 14. These studs have collars 40 embedded in the said support and shanks 41 projecting through said supports. A washer 42 and a nut 43 on each shank hold the studs in position. The studs 39 extend through slots 44 formed in the base 20 and parallel with the grooves 36. Disposed above the ends of the base 20 are clamp plates 45 through which the said studs extend. A nut 46 screwed on the threaded end of each of these studs clamps the base 20 in position upon the support 14.

The eccentric discs 37 are adapted to be rotated by means of the following construction. Rotatably mounted in the support 14 are pinions 47 which have attached to them shanks 48, best shown in Fig. 2. These shanks extend through the support 14 and the ends of the same are riveted over washers 49 underlying said support. The said gears frictionally engage the support and movement of the same is somewhat resisted. Each pinion is formed with a screw driver slot 50 by means of which the same may be rotated. The pinions 47 mesh with gear segments 51 formed on the eccentric discs 37. It will be readily comprehended that the eccentric discs 37 form guide members and that the guideways 52 formed by the edges of the slots 36 slide along said guides. By means of this construction the entire frame 19 may be moved bodily along the said discs in a direction parallel to the direction of extent of the slots 36 so that the contact surface 34 of the wheel 30 may be shifted with respect to the contact surface 35 of the wheel 17 and the speed of the shaft 22 varied within certain limits. It will also be comprehended that the frame 19 may be moved laterally with respect to the guideways 52 by rotating the pinions 47. Thus the pressure between the two wheels may be adjusted at will.

The use of the invention is obvious. Each tone generator produces certain tones and is driven by its driven shaft 22. This shaft is rotated by the driven wheel 30 which is driven by the driving wheel associated therewith. The pressure between the driven and driving wheels can be readily adjusted by loosening the clamp nuts 46 and adjusting the pinions 47. Speed of the shaft 22 can likewise be adjusted by shifting the frame 19 bodily along the guideways 52. When the parts are properly adjusted the frame 19 is clamped in position by tightening down the nuts 46.

The advantages of the invention are manifest. By using a rubber to wood drive and particularly end grain wood a drive is effected which is positive in action and which will operate for extended periods without appreciable wear or the requirement of pressure adjustment. With the particular invention the speed of the driven shaft and the pressure between the driving and driven wheels can be easily and accurately adjusted.

Having described my invention what I claim as new and desire to protect by Letters Patent is:

1. In combination a support, a frame mounted thereon, a driven shaft rotatably mounted in said frame and held from endwise movement relative thereto, a driving shaft rotatably mounted on said support and held from endwise movement relative thereto, and arranged in angular relation with respect to said driven shaft, a driven wheel on said driven shaft and having a conical surface, a driving wheel on said driving shaft and having a conical surface of greater longitudinal extent than that of said driven wheel and engaging said driven wheel, said frame having a base, two grooves in said base substantially parallel with the line of contact of the conical surfaces of said wheels, and forming guideways, eccentrics disposed within said grooves and rotatably carried by said support, said eccentrics engaging said guideways and guiding said frame for movement substantially parallel to the line of contact of the conical surfaces of said wheels, said eccentrics

upon rotation moving said frame laterally of the direction of extent of said guideways.

2. In combination a support, a frame mounted thereon, a driven shaft rotatably mounted in said frame and held from endwise movement relative thereto, a driving shaft rotatably mounted on said support and held from endwise movement relative thereto, and arranged in angular relation with respect to said driven shaft, a driven wheel on said driven shaft and having a conical surface, a driving wheel on said driving shaft and having a conical surface of greater longitudinal extent than that of said driven wheel, said frame having a base, two grooves in said base substantially parallel with the line of contact of the conical surfaces of said wheels, and forming guideways, eccentrics disposed within said grooves and rotatably carried by said support, said eccentrics engaging said guideways and guiding said frame for movement substantially parallel to the line of contact of the conical surfaces of said wheels, said eccentrics upon rotation moving said frame laterally of the direction of extent of said guideways and locking means for holding said frame in adjusted position.

3. In combination a support, a frame mounted thereon, a driven shaft rotatably mounted in said frame and held from endwise movement relative thereto, a driving shaft rotatably mounted on said support and held from endwise movement relative thereto, and arranged in angular relation with respect to said driven shaft, a driven wheel on said driven shaft and having a conical surface, a driving wheel on said driving shaft and having a conical surface of greater longitudinal extent than that of said driven wheel, said frame having a base, two grooves in said base substantially parallel with the line of contact of the conical surfaces of said wheels, and forming guideways, eccentrics disposed within said grooves and rotatably carried by said support, said eccentrics engaging said guideways and guiding said frame for movement substantially parallel to the line of contact of the conical surfaces of said wheels, said eccentrics upon rotation moving said frame laterally of the direction of extent of said guideways, a gear segment carried by each of said eccentrics and a pinion meshing with each of said segments and serving to rotate said eccentrics to adjust said frame laterally of the guideways therein.

4. In combination, a support, a frame mounted

thereon and having an elongated base, a shaft rotatably mounted in said frame and held from endwise movement relative thereto, said shaft extending in a direction parallel to said base, a driving shaft rotatably mounted on said support and held from endwise movement relative thereto and arranged in angular relation with respect to said driven shaft, a driven wheel on said driven shaft and having a conical surface, a driving wheel on said driving shaft and having a conical surface of greater longitudinal extent than that of said driven wheel and engaging said driven wheel, said base having two grooves therein, one at each end thereof, said grooves extending angularly with respect to said base and driven shaft and parallel to the line of contact of said wheels and forming guideways, guides mounted on said support and disposed within said grooves and means for moving said guides laterally of said grooves to vary the pressure between said wheels.

5. In combination, a driven shaft, a driving shaft therefor, arranged at an angle to said driven shaft, a driven wheel on said driven shaft having a conical surface, a driving wheel on said driving shaft having a conical surface of greater longitudinal extent than that of said driven wheel and contacting the surface of said driven wheel, means forming a guideway and a guide disposed therein and guiding said driven wheel for movement in the direction of the line of contact of the concial surfaces of said wheels and adjusting means for moving said guide laterally of said guideway to vary the pressure between said wheels.

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