May 15, 1928.

1,669,824

A. D. GROVER

GEARED TUNING PEG

Filed Dec. 23, 1925

2 Sheets-Sheet 1

Fig. 1.

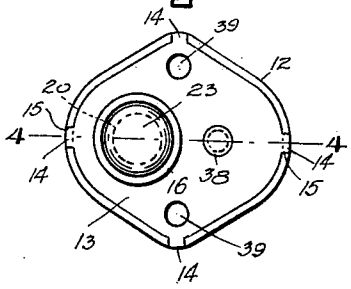


Fig. 2.

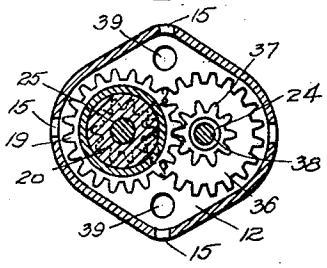


Fig. 3.

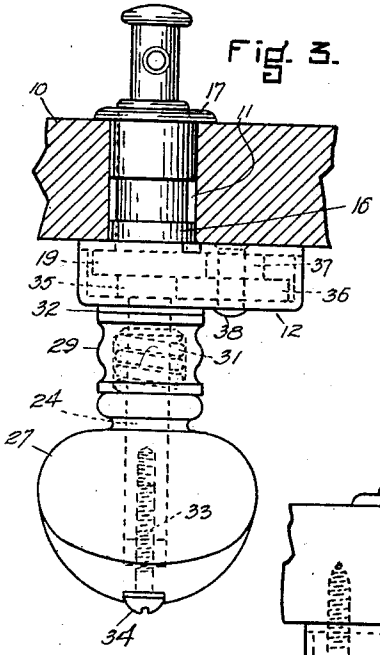
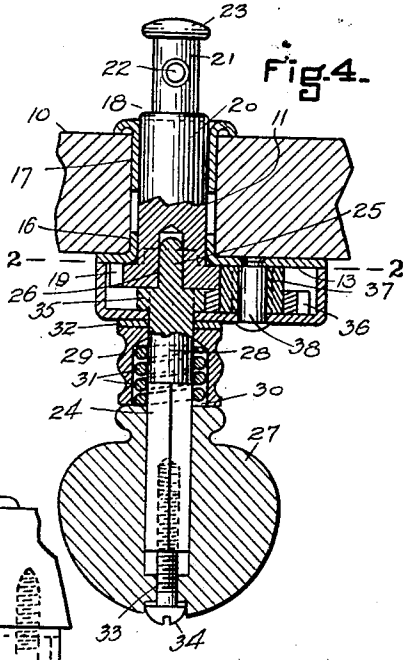


Fig. 4.



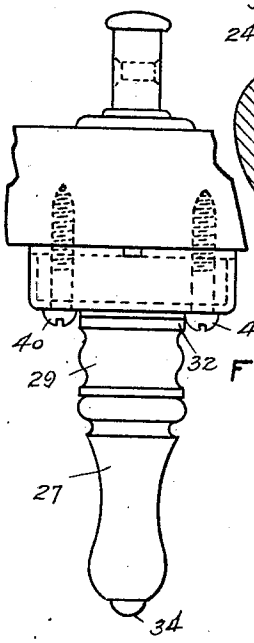


Fig. 5.

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Fig. 6.

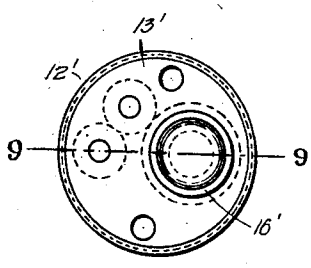


Fig. 7.

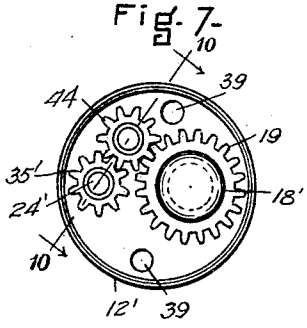


Fig. 8.

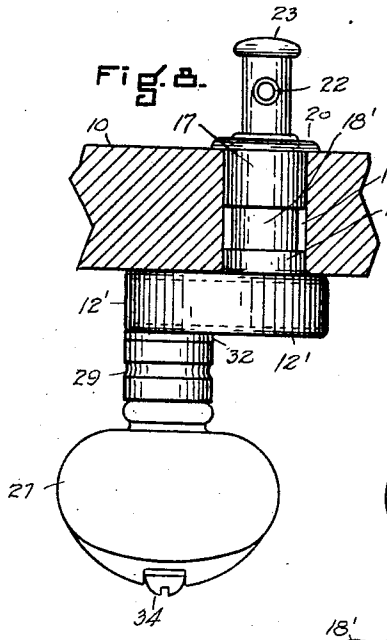
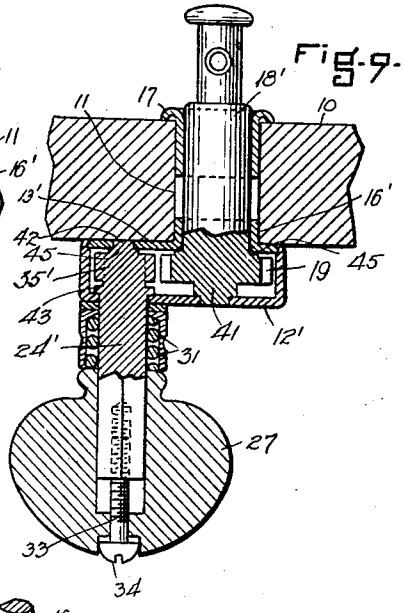


Fig. 9.



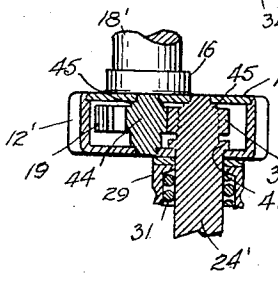


Fig. 10.

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Patented May 15, 1928. 1,669,824

UNITED STATES PATENT OFFICE.

ALBERT D. GROVER, OF LONG ISLAND CITY, NEW YORK.

GEARED TUNING PEG.

Application filed December 23, 1925. Serial No. 77,201.

My invention relates to tuning pegs for stringed musical instruments and has reference more particularly to improvements in tuning pegs of the geared type in which the finger piece may be rotated at a relatively higher rate of speed than that of the string shank, and as a consequence thereof very accurate tuning is made possible.

The principal object of the invention is to provide a tuning peg of this character which is relatively simple in construction, effective in operation and readily applicable to stringed instruments requiring the delicate tuning afforded by the use of such a peg.

A further object of my invention is to provide a tuning peg of this character wherein guiding elements are disposed in the peg hole of the instrument, such elements being arranged to accurately center the string shank in the peg hole thereby avoiding possible jamming of the shank with the wood wall of the opening when the tuning unit is applied to the instrument.

A still further object of the invention is to provide a tuning peg structure comprising a finger piece and shank, string shank, and a gear train carried by the shanks and disposed to provide for varying the speed of rotation between the two shanks.

I accomplish these objects by means of the structure and arrangement of parts shown in the accompanying drawings, in which: Figure 1 is a top plan view of my improved tuning peg embodying a three to one gear ratio; Figure 2 is a transverse sectional view of the same taken on lines 2—2 of Figure 4; Figure 3 is a side elevational view of the peg installed in the peg head of an instrument; Figure 4 is a longitudinal sectional view taken on lines 4—4 of Figure 1; Figure 5 is a side elevational view of the peg head and peg. Figure 6 is a top plan view of a slightly modified form of my invention and Figure 7 is a top plan view of the gear casing with cover removed to disclose the gear train; Figure 8 is a side elevational view of the modified construction mounted in a peg head; and Figure 9 is a substantially longitudinal sectional view of the same, taken on the lines 9—9 of Figure 6; and Figure 10 is a sectional view taken on lines 10—10 of Figure 7.

Referring to the drawings, 10 denotes the head portion of a string musical instrument and 11 the peg opening therein.

In the preferred embodiment of the invention illustratively exemplified in Figures 1 to 5 inclusive, the peg proper comprises, a gear casing 12 which is a substantially diamond shaped cup member stamped from a single piece of sheet metal, and which at its open end is provided with a cover piece 13, the ends thereof being provided with small projections 14 adapted to seat in notches 15 cut in the edge of the casing 12 at the corners thereof. On the longitudinal axis of the cover piece and adjacent one end thereof, the material is punched outwardly to form a collar or bearing sleeve 16 adapted to project into the peg opening 11 at the under side thereof and to be of sufficient diameter to hug closely the wall of the said opening. A second bearing or eyelet 17 is similarly arranged in the other end of the opening 11, as illustrated in Figures 3 and 4, the two bearings being alined to provide an accurate support for a rotating string shank 18.

The string shank 18 is an integral member and comprises a spur gear 19 arranged within the casing 12, a bearing surface 20 projecting axially of the gear 19 and supported in the bearings 16 and 17, and a string receiving spindle 21 projecting axially beyond the surface 20 and provided with a transverse string opening 22 and cap 23. Alined with the string shank 18 and projecting from the closed end of the gear casing 12 is arranged a button shank 24, which is provided with a reduced inner end portion 25 mounted to rotate in a bore 26 at the gear end of the shank 18, and which is square in cross section at its free end to receive a button 27. Interposed between the bead of the button 27 and closed end of the gear casing 12 and arranged about a cylindrical portion 28 of the button shank 24, is a thimble or cup shaped piece 29 having its closed end provided with a bore to receive the portion 28 of the shank adjacent the closed end of the casing 12 and a bore of substantially larger diameter in the body of the cup to form a spring chamber 30, the open end thereof being closed by the bead or base of the button 27. A coiled spring 31 is disposed within the chamber 30, the coils thereof embracing the shank 24 and tending normally to force the cup towards the gear casing 12. A washer 32 is disposed about the shank 24 between the cup 29 and casing 12. In order to exert the necessary pressure to collapse the spring 31 within the chamber 30, the outer end of the button 27 is provided with a bore 33 com-

municating with the broached hole in the body of the button and mounted in this opening 33 and adjustable in a threaded bore in the end of the square shank 24, is a machine screw 34, which when tightened tends to telescope the button over the shank and against the spring until the bead or butt end of the button is contacting with the adjacent open end of the cup 29.

Arranged within the gear casing 12 and integral with the button shank between the cylindrical portion 28 and reduced portion 25, is a pinion gear 35 which meshes with an idler gear 36 carried by an idler pinion 37 in mesh with the spur gear 19. The pinion 37 is cut from a length of pinion rod which projects through and is rigid with the gear 36 and is of a length equal to the distance between the closed end of the casing and the cover piece 13. The pinion 37 is loosely mounted on pin 38 fixed at one end in the cover piece 13 and at the other in the casing 12, as illustrated in Figure 4. The pin 38 aside from forming a bearing for the pinion 37 also holds the casing and cover together, both of which are provided with alined openings 39 to receive wood screws 40 adapted to be inserted in the peg head 10.

According to the modification illustrated in Figures 6 to 10 inclusive, the gear casing 12′ is composed of a circular cup shaped member having a cover piece 13′ which rests in a groove disposed about the inner periphery at the open end. The cover 13′ in this instance is also stamped out adjacent the periphery to form a bearing sleeve 16′ which is arranged in one end of the opening 11 while the opposite end is provided with an eyelet 17 similar to the arrangement illustrated in Figure 1 to 5 inclusive. The string shank 18′ in the modified embodiment is provided with a projection 41 beyond the gear 19, the projection being rotatably mounted in the closed end of the casing 12′, as illustrated in Figure 9. Adjacent the periphery of the casing 12′ and at the side thereof opposite to the string shank 18 is mounted the button shank 24′ having one end provided with an integral pinion 35′ and the opposite end extensible in the button 27, as previously described. The button shank 24′ is provided at the extreme end beyond the gear 35′ with a projection 42 rotatably mounted in an opening in the cover piece 13′. The shank is further provided with a flange 43 spaced from the gear 35′ and arranged to bear against the inner surface of the closed end of the casing. Movement is imparted from the button shank to the string shank through an idler pinion 44 mounted in the casing 12′ and held constantly in mesh with the gears 19 and 35′, as illustratively exemplified in Figure 9. The surfaces of the gears 19 and 35′ and pinion 44 adjacent the under surface of the cover piece 13′ are provided with shoulders 45 which not only keep the gears in vertical alinement but illuminate as far as possible all frictional engagement with the surface of the cover.

In the assembly of the peg after the movable parts are arranged and the cover 13′ disposed in the groove of the casing 12′, the edge or bezzle of material defining the groove is turned over on the cover, as illustrated in Figures 9 and 10, thereby producing a case which is entirely dust and dirt proof.

The modified embodiment of the invention shown in Figures 6 to 10 inclusive, is particularly adaptable for use in connection with the cheaper grades of instruments not ordinarily sold with the gear type tuning peg. Practically no hand work is required to produce the article, and as a consequence the peg may be offered to the public as at retail price attractive enough to induce its adaption to old instruments as well as to new low priced instruments.

According to the present invention I have illustrated the gear and pinions as having a ratio sufficient to produce a speed ratio of the button and string shanks of 3 to 1, which results in a very fine degree of tuning.

It will be clear that in both forms illustrated the gears and shanks are capable of being securely locked in any position because of the frictional engagement of the parts brought about by the spring action against the cup member.

What I claim is:—

A geared tuning peg for stringed musical instruments, comprising a rotary shank adapted to receive a string and having one end terminating in an integral gear element, a second rotary shank arranged co-axially of the first shank and having one end terminating in an integral pinion gear, and an idler gear element comprising a pinion rod having a portion thereof in mesh with said gear of the first shank, a spur gear arranged on the other portion of the pinion rod and in mesh with the pinion of the second shank, a casing enclosing the train of gears, and spring means disposed about said second rotary shank to normally force the pinion thereon into close contact with the casing to frictionally resist turning motion of the said pinion when tension of the string has a tendency to unwind the same and rotate the other gears.

In testimony whereof I affix my signature.

ALBERT D. GROVER.