

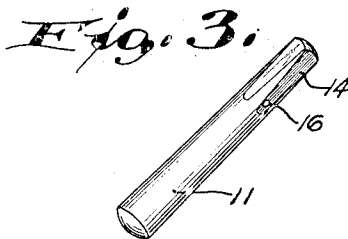
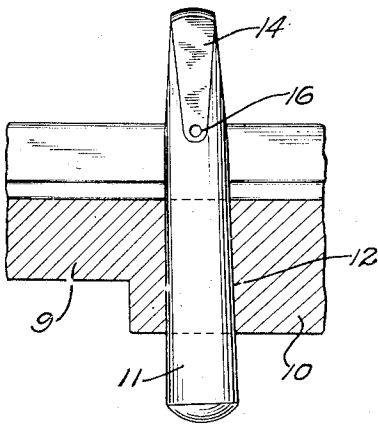
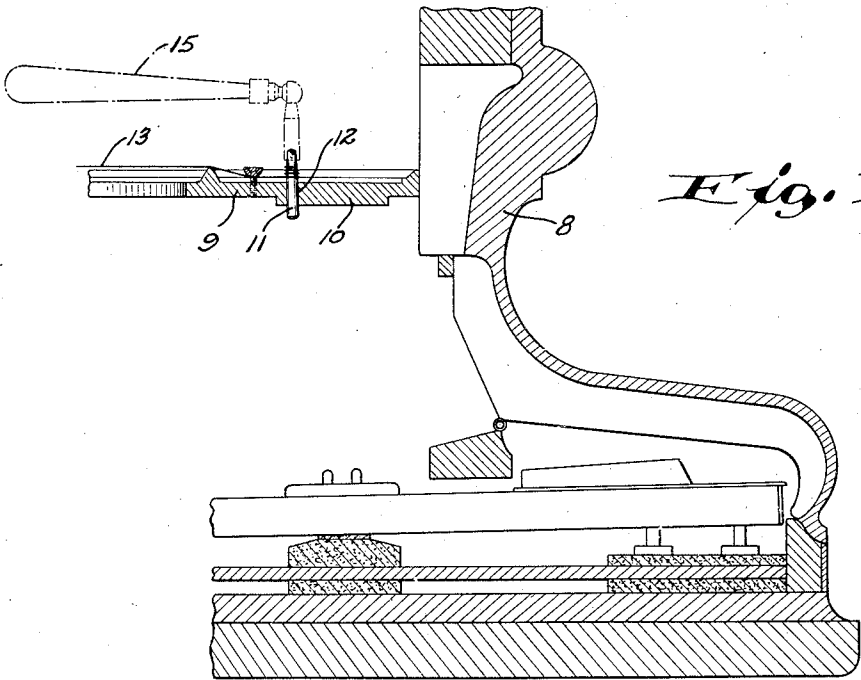
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TUNING PIN CONSTRUCTION

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TUNING PIN CONSTRUCTION

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1 Claim. (Cl. 84—202)

This invention relates to improvements in tuning pin construction, more particularly adapted for use on pianos.

It has heretofore been common practice to use wood for the pin blocks of pianos, and while there are numerous recognized objections to the use of wood, practically no progress has been made, over a long period of years, in overcoming these objections. With present methods of construction, a pin block of wood is secured to a string frame of metal, and metal tuning pins are set in the pin block. Inasmuch as metal and wood have radically different co-efficients of expansion, there is a continual stress set up between the string frame and pin block as well as between the pin block and metal tuning pin. Furthermore, the pin block is readily affected by changes in humidity and will swell or shrink in accordance with atmospheric conditions, while the metal string frame and tuning pin in no way are affected by moisture. As a result of the above, the present-day piano will remain in proper tune only under constantly ideal conditions of temperature and humidity. Furthermore, rock maple is the only wood which is at all suitable for pin blocks, and the supply of this particular wood is rapidly becoming exhausted. In addition, that which is now being used varies considerably in quality.

Inventions heretofore proposed with metal pin blocks have been entirely impractical for commercial use as they have failed to properly consider the technique of the tuner, in that tuning methods had to be radically changed to use the proposed constructions.

It is therefore one of the objects of the present invention to provide an improved tuning pin construction wherein a metal pin block is utilized and wherein the pin and pin block are so constructed that the pin is maintained in properly seated position without the use of auxiliary locking devices thereon.

A more specific object of the invention is to provide a construction wherein the pin block has a tapered pin bore which converges upwardly, and wherein a pin having a like taper is insertable from the bottom of the pin block, the piano string being windable on the upper end of the pin and the tension and action of said string serving to automatically maintain the pin in properly seated condition.

A further object of the invention is to provide a construction as above described, wherein the axis of the pin and pin block bore may be inclined slightly toward string tension so that the

pin may be additionally urged by said tension to properly seated condition.

A further object of the invention is to provide a tuning pin construction embodying a metal pin block wherein said pin block may be formed as an integral depending part of the string frame.

Other objects of the invention are to provide a tuning pin construction which is unaffected by conditions of temperature and humidity, which is simple and inexpensive in construction, which involves the use of a minimum number of parts, which in no way alters the present technique of the tuner, and which is well adapted for the purpose described.

With the above and other objects in view, the invention consists of the improved tuning pin construction and all its parts and combinations as set forth in the claim and all equivalents thereof.

In the accompanying drawing illustrating one complete embodiment of the preferred form of the invention, in which the same reference numerals designate the same parts in all the views,

Fig. 1 is a fragmentary vertical sectional view through the front portion of a piano showing the improved tuning pin construction;

Fig. 2 is an enlarged fragmentary vertical sectional view through a portion of the string frame and pin block extension, with a tuning pin in position therein; and

Fig. 3 is a perspective view of the tuning pin alone.

Referring more particularly to the drawing, the numeral 8 designates a portion of a piano having a string frame 9 of metal suitably associated therewith. A portion of the string frame is of increased thickness to form a depending integral pin block portion 10 which is also of metal. The pin block 10 and string frame 9 are preferably constructed of cast iron having a relatively high graphite content for a purpose to be hereinafter set forth. The tuning pins 11 are of hardened steel so that if there is any wear as a result of frequent tuning, it will be on the pin block rather than on the tuning pin, and so that the pin will turn smoothly in the pin block, with freedom from squeaks and the like.

For each tuning pin there is a hole 12 reamed through the pin block and string frame. Each hole is of slightly tapered formation with the wide portion of the taper at the bottom of the pin block, and it is preferred that the axis of each hole be inclined at an angle of approximately two degrees toward the tension of the strings 13. It

is preferred that the taper of the holes 12 and pins 11 be approximately .0105 of an inch.

Each tuning pin 11 has an upper shank portion squared as at 14 in the usual manner to cooperate with the usual tuning hammer 15. Below the squared upper end the pin is uniformly tapered toward its enlarged lower end, and the taper of the pin is adapted to coincide perfectly with the taper of the reamed hole 12.

10 The upper end of each pin is formed with the usual transverse aperture 16 for receiving the end of one of the strings 13 and said strings are windable on the pin in the usual manner as indicated in Fig. 1.

15 When the piano is being strung, the pins 11 are of course inserted from the bottom of the pin block and may be tapped slightly from the bottom with a hammer to gain the necessary torsional resistance. The pins may then be

20 turned with the tuning hammer to place the strings under proper tension and put the piano in tune. Due to the fact that the wide portion of each tapered pin is at the bottom, upward movement of each pin is limited. After the piano

25 has been suitably strung and tuned, downward movement is prevented by the fact that the tension of the strings on the pins tends to exert a holding force thereon and it is found that said tension also exerts an upward pull to maintain

30 the pins in properly seated condition. In addition, the vibration of the strings during use will tend to exert a similar upward pull on each pin. In order to make this upward pull more pronounced, it is preferred to have the axis of the

35 holes 12 inclined slightly toward string tension. Thus there will be a definite upward component of force tending to constantly urge the pins to properly seated condition.

40 The tuning of the piano from time to time during use can be done in the usual way and the technique of the tuner is in no way altered. With

this construction, the tuning pin can be turned in one direction as easily as the other, and the strings 13 can be readily brought to proper pitch. An even more delicate tuning can be obtained with the present arrangement than with the present-day wood pin block construction, due to the fact that there is always a perfect seating between the pin and pin block, whereas with the wood pin block construction the seating varies constantly with temperature and humidity conditions.

If, after a number of tunings there is slight wear on the sides of the holes 12 of the pin block, this will make no difference as the tension of the strings will constantly act to draw the pin upwardly. Due to the use of the relatively large amount of graphite in the casting for the string frame and pin block, there is always a natural lubricant for the pin to turn on.

Various changes and modifications may occur to those skilled in the art, and the invention may also be adapted for use on stringed instruments other than pianos, and all of such changes and adaptations are contemplated as may come within the scope of the claim.

What I claim is:—

A tuning pin construction comprising a pin block having a tapered bore extending there-through which converges upwardly, a metal tuning pin having a complementary taper, said pin being insertable from the bottom of said pin block and the taper of the pin and bore serving to limit upward movement of said pin, and a tensioned string windable on the upper portion of said pin above the pin block, the tension of said string serving to maintain the pin in properly seated condition, the axis of said bore being inclined toward spring tension so that there is an upward component of force tending to constantly urge the pin to properly seated position.

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