7848X

J. J. Wise,

Tuning Pianos,

Patented Nov. 19, 1833.

Fig. 1.

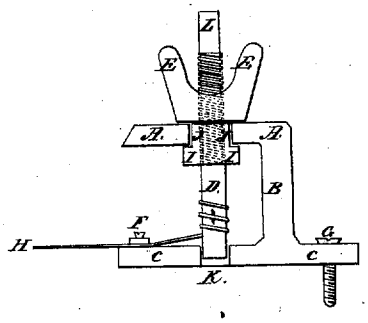


Fig. 2.
Tuning hammer.

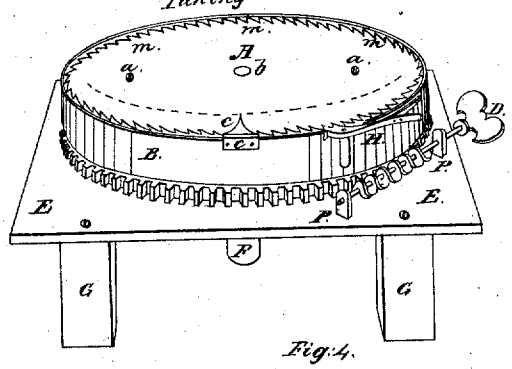
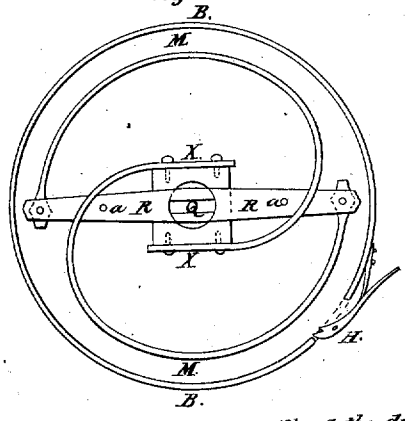
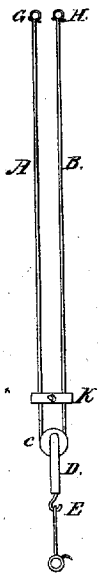


Fig. 3.



The tuning hammer without the dial plate shewing the spring and lever.

Fig. 4.



Tuning Pin.

A.M. PHOTO-LITHO. CO. N.Y. (OSBORNE'S PROCESS)

John S. Nice

Nov 19, 1833

The Schedule referred to in the Specification and making part of the same containing a description in the words of the said John S. Nice himself of his improvement, in the mode of tuning pianos and other stringed musical instruments.

To all to whom it may concern —

Be it known that I John S. Nice of the City of Baltimore in the State of Maryland have invented a new & useful improvement in the mode of tuning pianos and other stringed musical instruments which I shall call Nice's mechanical tuning hammer and which is accurately described in the following words and figures My improvement consists of a mechanical combination, founded upon the fact or principle that sound upon stringed instruments varies with the degree of tension given to the strings being "high" in musical language as the tension is increased and "low" as it is diminished. Every string is capable of producing a certain number of musical notes, and the same degree of tension will produce the same note on strings of the same size and length, or within so close an approximation as to render any difference imperceptible to the ear. It is also a fact upon which my improvement is founded, that the degree of tension to produce any given note is capable of being measured and ascertained to a sufficient degree of exactness. If therefore a person wishing to tune a stringed instrument, should be furnished with the means of giving to a string the tension necessary to produce a certain note he will be able to tune the string to the required note and if a number of strings were to be tuned a stringed instrument before the ordinary judgment of tuners and though

the sounds not have an ordinary tolerable degree of
fineness". The mechanical combinations on the manner
by which Spradue this result consists of two parts —
1st a peculiar arrangement of the fastenings of the move-
able ends of the strings of the instrument 2. a mechan-
ical turning harmonic, the combination of these two
parts is as follows, 1. the fastenings of the moveable ends
of the strings, these may be made in various ways, but
all must comply with the condition that the turning
pin shall move perfectly free, and as far as prac-
ticable, without any other friction than that which
the tension of the string may cause. In ordinary
stringed instruments, the turning pin is made to
retain the string at the required tension by the fric-
tion of the pin in the turning block, as a piano or
harp, or the screw pin in the neck of a guitar or vio-
lin. In my improvement there must be no such fric-
tion if practicable, or as little as practicable, so that
the least perceptible tension shall be sufficient to move
the pin unless retained by other than its own friction
in the substance in which it is put. The mode which
I have adopted although there may be many others equal
by application is to have screwed to the turning block in a
piano, a metallic ledge, which is represented at figure
No 1. on the accompanying drawing where a section
of it is given at the letters A.A. about one fourth of
an inch thick and one and a half — with wide
recess about one and a half inch from the turning
block by a metal support B. which in its turn is
fixed to a bar. C.C. the ledge highest and bar having
all of the same piece of metal screwed to the turning
block by the screw at C. The holes for the turning pins are
in the ledge A.A. and exactly the same relative position

of ordinary) and corresponding with each hole, as the large is a smaller one K below in the base. The turning pin L.D. is of the size of the hole in the base, say one fourth of an inch in diameter, and has secured upon it a fixed nut of the shape J.J.J.J. the upper or narrowest part of which J.J. fits so as to turn with the least possible friction in the hole in the large. The nicks in which this nut is fastened to the turning pin is made necessary by the large and base being inseparable. Above the large A.A. (and on the turning pin, is a movable thumb screw G.G. by turning which the large is pressed or squeezed between the thumb screw and the shoulder I.I. of the fixed nut the turning pin secured in any required position — The string H is fastened to the turning pin near where it enters into the base at K. of the turning large — We order to press the strings on the back of the turning large, which is done upon the turning block, in the ordinary mode of construction by making the strings press against small brass pins, I use a small piece of steel or iron for every two strings F. which I press against them by a second spring through it and screwing between the two strings into the base of the turning large. This may be dispensed with though I think it preferable to use it. 2. The turning key case. This consists of a steel screw, see the figure N°2 in the accompanying drawing F with a hole at bottom fitting the head (L fig. 1.) of the turning pin and the upper ends of which screw pass into a cylindrical key B. and is made to connect (by R. fig. 3.) by means of a bar (R.R. fig. 3.) with the two ends of steel springs (M.M. fig. 2.) the other ends of which are fastened to the key (X. X. fig. 3.) so that by turning the key B. the whole or either the turning pins screwed to the screw F fig. 2. may

...to the lever R.R. fig. 2. causes the spring M.M. to...ordinate or effect as may be. Rotation to the time by means of small screw at (a.a. figs. 2 & 3.) and forming the top of the box is a dial plate A fig. 2. marked with hour divisions to indicate through the agency of the spring, the fine motion effects at any moment, and the rate of which has been ascertained by experiment. The edge of the dial plate (m.m.m.m. fig. 2.) is notched so that it may be retained in any given position by a catch fixed on the box H. figs. 2 & 3. forming the well known contrivance of a ratchet and click. The index C.C. fig. 2. is made fast to the box. The box with its contents is placed upon a frame of metal B.B. fig. 2. so made as to raise the box by small legs G.G. fig. 2. a proper distance from the ledge A.A. fig. 1. The pipe F fig. 2. passes through this frame permitting the box to move on the frame around it as an axis.

The mode of applying the mechanical turning force and the manner of its operation is as follows. The pipe is put upon the turning pin, when the frame will be found to rest on its legs on the ledge A.A. fig. 1. and the lever turns the box B. fig. 2. to tighten the string to be turned, first loosening the thumb screw E.E. fig. 1.

The turning pin moves freely in the ledge, until the string begins to pull when the spring is contracted and the dial plate necessarily travels forward. The lever then continues to turn the box until the index points to the mark on the dial plate, which indicates the degree of tension necessary to produce the required note on the particular string. The catch then holds the dial plate from traversing backwards, while the lever turns the thumb screw, and confines the turning pin in the position to which he has brought it, thereby maintaining the proper degree of tension. To produce the same required

tuning pin. Inside the metal holder E fig 1. is placed a piece of wood screwed down on the strings — — —

In addition to the ratchet and click of the dial plate and key. I use an endless screw D. fig. 2 for the purpose of making more minute divisions. This is fastened to the frame at P.P. fig. 2. and works into cogs projecting from the key. The key it will be recollected is moving round the pin through the frame. The points on the dial plate indicating the tuning for all required notes, are previously ascertained by trials and appropriate distinctions for the application of the instrument to the different strings accompany it.

In connection with the mode of fastening the moveable ends of the strings herein before described, and for the purpose of simplifying the operation of the mechanical tuning harmonic, I use a new mode of stringing the piano, by which one tuning pin is made to answer for two strings, by which the number of tuning pins is reduced to one half and the time required to tune the piano shortened. Two adjoining strings as A.B. fig. 4. are formed of the same piece of wire, the two ends of which are fastened to the adjacent brick pins G.H. fig. 4. On the loop which is formed in the wire by this arrangement a pulley whose diameter is equal to the proper distance between the two strings when stretched is placed C. fig. 4. Which pulley has a slit and hook D.E. to which is — — — fastened the wire that goes round the tuning pin. The motion of the tuning pin draws back the pulley, and stretches the string on either side of it equally — and when a sufficient tension is given the pin is driven down into a hole E fig 4. to secure them and confine the strings. On making use of the mode of stringing above

and, the tuning bridge is thrown far enough back to make room for the fingers, and the screws which at A. fig. 1. confine the strings serve into a separate fixture for them. The above described mode of stringing five strings to one tuning pin may be used or not at pleasure. The correctness of the tone of a piano or other stringed instrument may always be secured by applying the key to the tuning pins and bringing the index to the proper position on the dial plate.

The construction here described is particularly fitted for the piano and Harp. a small modification would be necessary for the guitar and violin.

What I claim as new, and for which I ask an exclusive privilege is 1. The arrangement or mode by which the movable ends of the strings are fastened or loosened, as well when there is a tuning pin to each string as when the piano is so strung as to require only one tuning pin for five strings. 2. The mode of tuning a piano or stringed musical instrument without the assistance of the ear by measuring and ascertaining the degree of tension necessary to produce any required note on a given string or strings. and furnishing the tuner with the means of applying that degree of tension precisely and mechanically. and 3. The combination by which the end desired is effected.

Witness

Sm. M. B. Tatlow Thos. P. Pike

Benj. C. Popleman

(209. rmd)