F. HUGGINS.

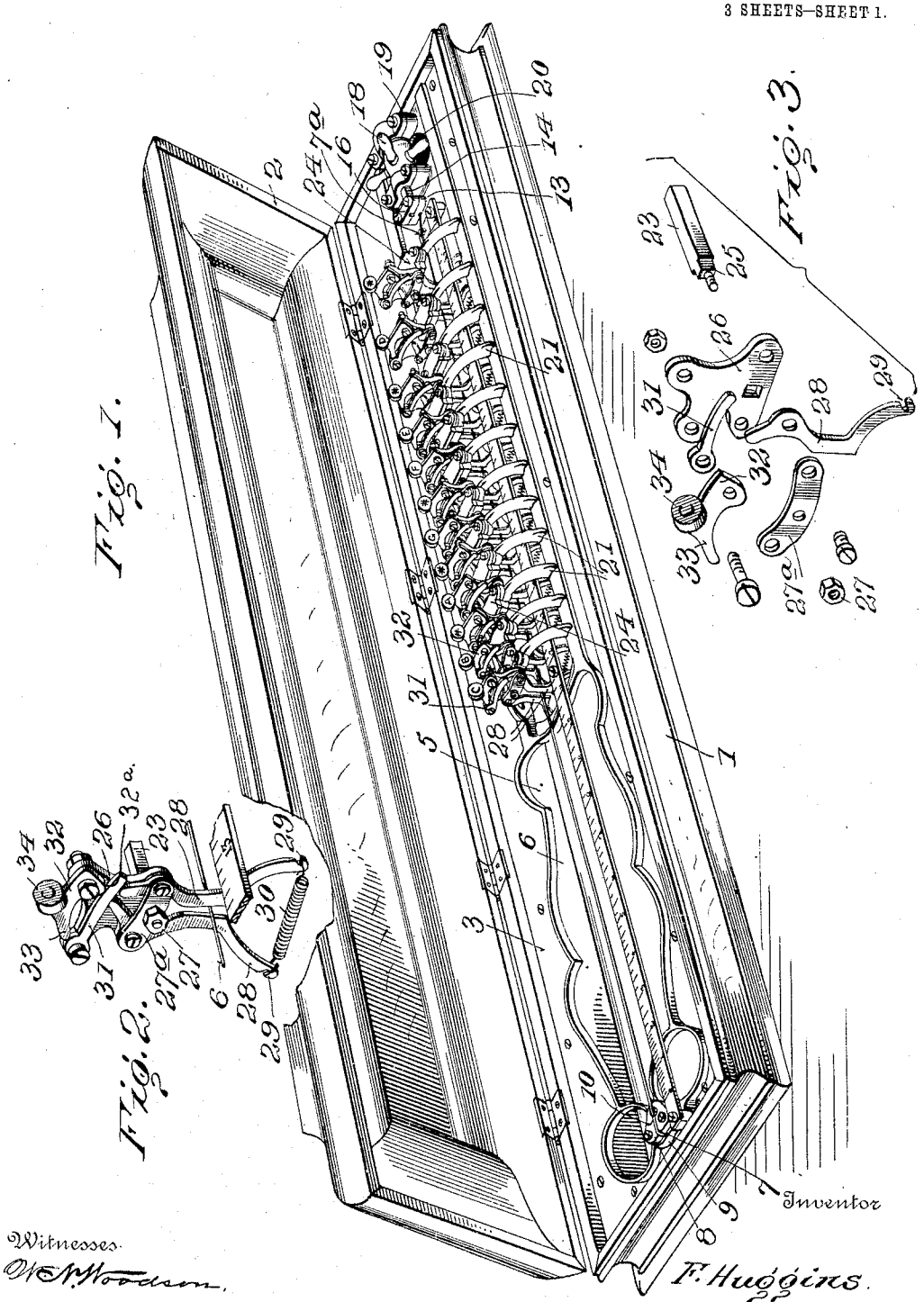
PIANO TUNING APPLIANCE.

APPLICATION FILED NOV. 30, 1909.

977,094.

Patented Nov. 29, 1910.

3 SHEETS—SHEET 1.




Witnesses.

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3 SHEETS—SHEET 2.

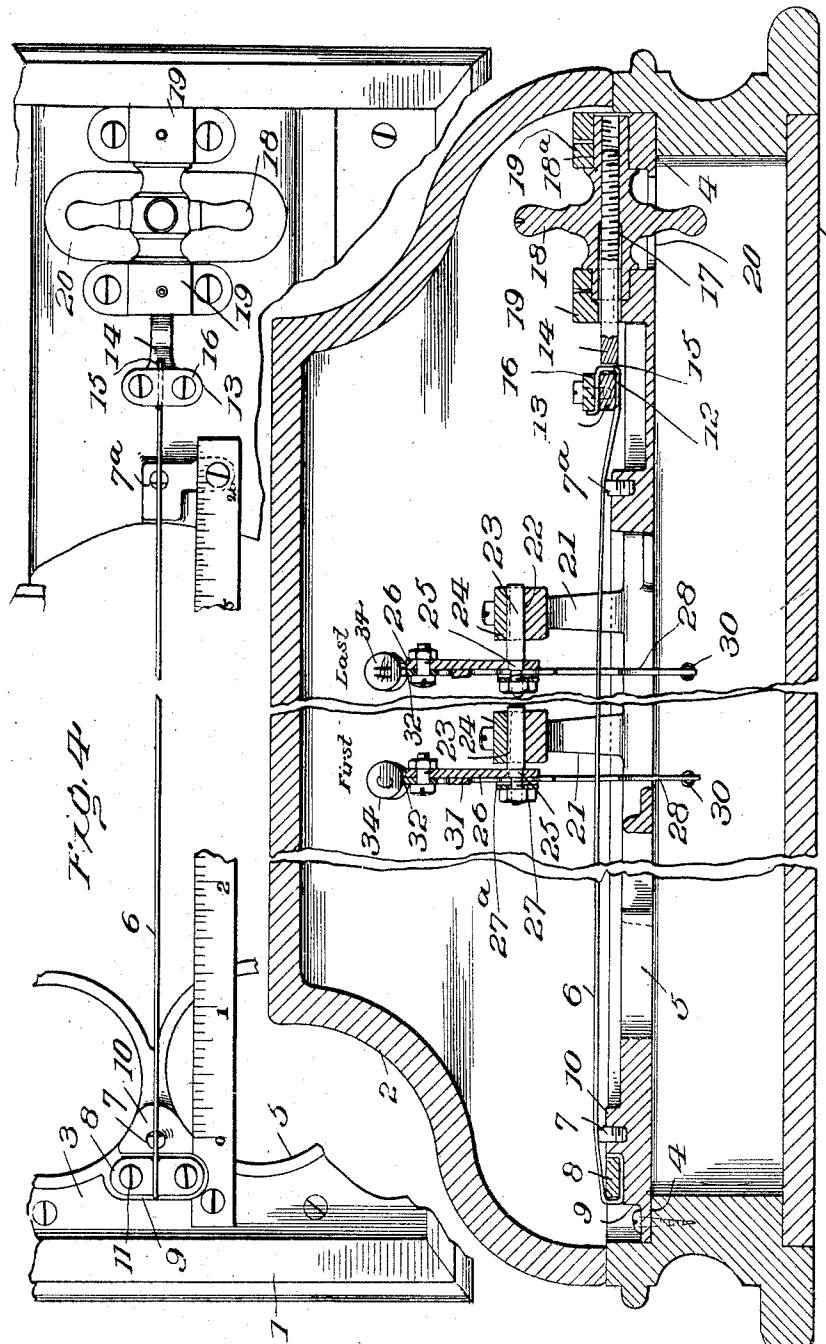


Fig. 5.



Fig. 4.

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3 SHEETS—SHEET 3.

Fig. 6.

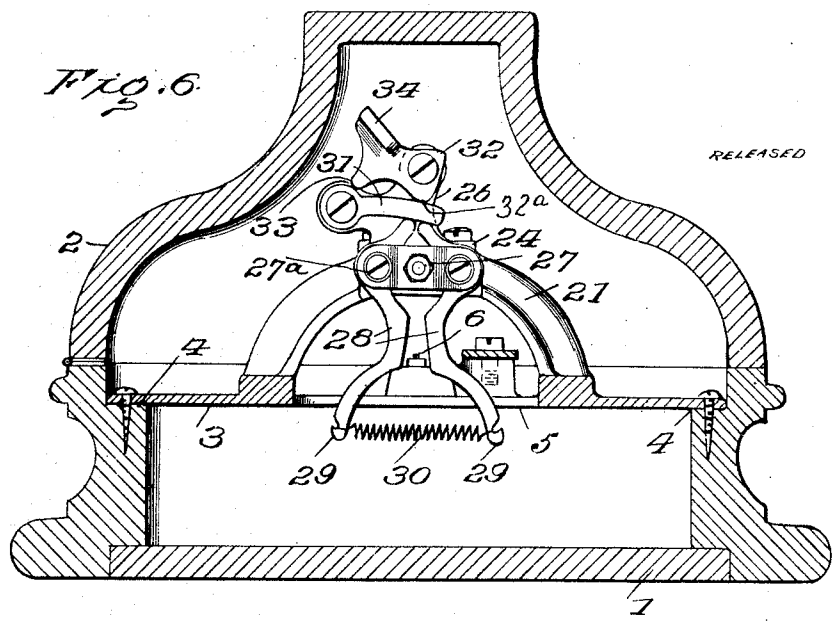
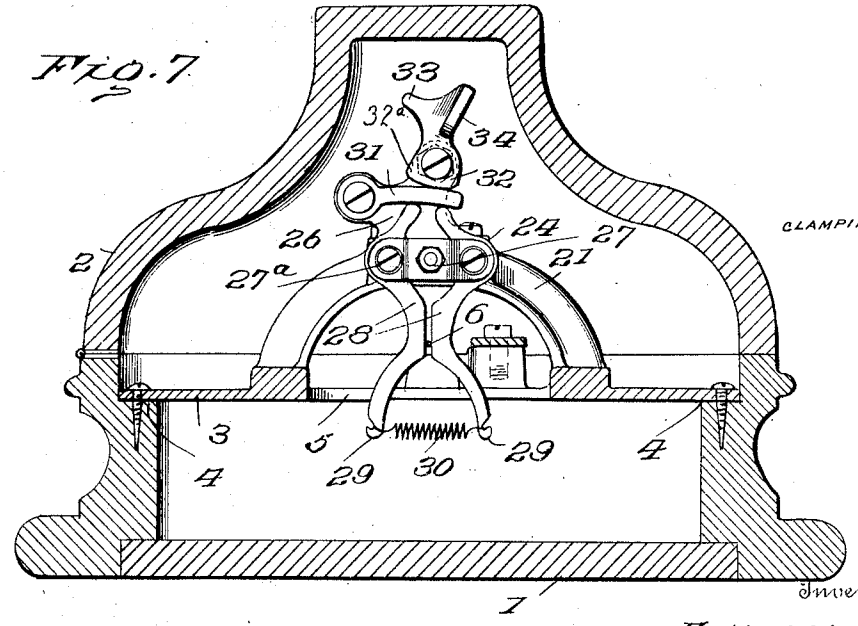



Fig. 7.

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# UNITED STATES PATENT OFFICE.

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## PIANO-TUNING APPLIANCE.

977,094. Specification of Letters Patent. **Patented Nov. 29, 1910.**

Application filed November 30, 1909. Serial No. 530,541.

*To all whom it may concern:*

Be it known that I, FRED HUGGINS, citizen of the United States, residing at West Granby, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Piano-Tuning Appliances, of which the following is a specification.

This invention comprehends certain new and useful improvements in appliances for use in the operation of tuning pianos or other stringed instruments, reed or pipe organs or musical instruments generally.

The invention has for its primary object an improved device of this character which will enable anyone possessed of sufficient knowledge to manipulate the tuning keys or the like and with a sufficient musical ear to determine the consonance of two sounds to readily tune a piano or other instrument without possessing a particularly trained ear such as would be necessary to even determine one tone from another.

The invention also has for its object a device of this character the fundamental and dominant tone of which may be easily raised or lowered and the intervening notes accordingly so that the instrument may be tuned to any pitch. And the invention also has for its object a tuning appliance of this character which will be accurate in all of its parts, capable of being easily assembled and readily adjusted, which will be simple and efficient in operation and durable and not liable to get out of order.

With these and other objects in view as will more fully appear as the description proceeds, the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereinafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings in which:

Figure 1 is a perspective view of a device constructed in accordance with my invention; Fig. 2 is a detail perspective view of one pair of string clamping clips. Fig. 3 is a similar view of the string clamping devices detached. Fig. 4 is a top plan view on an enlarged scale and illustrating only those parts that are necessary to show the means for holding the musical string of the device under tension; Fig. 5 is a longitudinal sectional view of the device; parts being broken out; and, Figs. 6 and 7 are transverse sectional views showing one pair of string clamping clips in released and clamping position relatively.

Corresponding and like parts are referred to in the following description and indicated in all the views of the accompanying drawings by the same reference characters.

In the preferred embodiment of the invention, the working parts are mounted within a suitable case or cabinet 1, provided with a hinged or other lid 2 to protect the parts from dust, and unnecessary exposure to variations in temperature when the appliance is not being used. Within the casing 1 is a base or supporting frame 3 which is secured in a relatively elevated position being secured in the present instance by screws or similar fastening devices on a ledge 4 formed within the body portion of the case. This frame may be of any desired metal or material, and is formed with a longitudinal opening 5 of any desired extent and defined by walls of any desired configuration as judgment or taste may dictate in order to add to the attractiveness of the appearance of the device, a string 6 being stretched across the frame whereby the various prompting tones are produced to give forth the tones with which the strings, reeds or the like of the instrument being tuned are brought into consonance.

The string 6 is of wire in the present instance being similar to a piano string and is stretched over grooved bridges 7, $7^a$ secured to or formed on the upper face of the supporting frame 3 at opposite ends of the opening 5. One end of the string 6 is secured tightly in place by being passed over a clamping bar 8 and thence downwardly and returned underneath said clamping bar being clamped between the same and a ledge 9 formed on the frame, the clamping bar being secured to said ledge by stud screws 11 or the like. Preferably, the extremity of this end of the string is passed upwardly between one side edge of the clamping bar and a relatively high ledge 10 to which the bridge 7 is secured, said extremity preferably lying in a shallow groove formed in said edge of the clamping bar. By this means it will be seen that this end of the string will be very tightly held and effectually prevented from slipping. The other end of the string 6 is passed over a groove 12 formed in the lower face of the head 13 of a

tensioning bar 14, and is then passed upwardly through an aperture 15 formed in the bar and thence extended backwardly between the head 13 and the clamping bar 16 secured thereto by stud screws or similar fastening devices. The extremity of this end of the string is preferably bent backwardly so as to lie against one edge of the clamping bar 16 and thereby securely hold the wire to preclude the possibility of slipping.

In order to increase or decrease the tension upon the wire 6, the tensioning bar 14 is mounted for longitudinal adjustment. In that form of the invention illustrated in the accompanying drawings, this adjustment is effected by making one end of said bar 14 round and forming screw threads thereon, as indicated at 17, and by mounting the threaded portion of the bar in an interiorally threaded hub 18ª of a nut 18 provided with any desired number of handles by which it may be turned. The two hubs or ends of this nut 18 are journaled in bearings 19 with which the frame 3 is provided, and the latter is formed between said bearings with an opening 20 into which the handles may successively pass as the nut is turned in one direction or the other to decrease or increase the tension of the string and the consequent pitch thereof.

In order to hold the tensioning bar 14 as against any turning movement as it is longitudinally adjusted by the turning of the nut 18, said bar is formed with a non-circular portion (square in the present instance) which is mounted for movement in a corresponding opening formed in one of the bearings 19, as clearly illustrated in the drawings.

In order to sound the different notes of the chromatic scale, so that the tuner may use the same as prompting notes with which to bring the strings of his instrument into consonance, I have provided a series of string clamping devices or clips, the construction, arrangement and operation of same, I shall now proceed to describe.

The supporting frame 3 is formed with a series of arched brackets 21 extending from side to side of one portion of the opening 5, and spaced from each other at predetermined intervals. Each bracket 21 is formed substantially at its apex, with an upwardly facing socket 22 extending transversely of the bracket and rectangular or otherwise non-circular in cross section and designed to receive a stem 23 of corresponding cross sectional shape, said stem being held securely in the socket after it has been properly adjusted therein by a clamping bar 24 secured to the bracket by stud screws 22. Each stem 23 is formed with a preferably square reduced neck 25 upon which a vertically disposed plate 26 is riveted, and preferably metallic dampers 28 are pivotally connected intermediate their ends on the respective plates 26, preferably near the lower ends of the latter, said dampers extending vertically as shown edge to edge in transversely disposed pairs. 27ª designates a spring steel clamping bar which is apertured at its ends so that it may be positioned back of the heads of the fastening devices on which the dampers 28 are pivotally mounted there being one of these clamping bars for each pair of dampers. After the clamping bars have been secured in place nuts 27 are screwed on the threaded extremities of the respective stems 23 so that the dampers 28 may be tightened whenever desired by merely screwing up the nuts 27. The dampers 28 are formed with diverging lower ends as shown, the extremities of which are provided with hooks as indicated at 29 over which the looped ends of the contractile springs 30 are engaged. The springs manifestly exert a tension upon the clips 28 to draw the same together and clamp the string 6 between their opposing straight edges, as clearly illustrated in the drawings so as to shorten the vibrant portion of the string, as desired, to produce the desired tone. In their normal unobstructed position, the clips 28 are free to move or rock in both directions. It is of course necessary, to produce the required tone to stop the vibrations of the string at the point where the clips engage the string, but if the string is not central, and the clips should crowd it to one side or the other, the calculated tone would not be produced. Hence it will be understood that by allowing the clips freedom of movement sidewise in opposite directions, they will grip the string tightly, wherever it may be and not crowd it, the springs at the lower ends of the clips holding the latter in engagement with the strings and stopping the vibrations at that point. In order to hold the clips 28 away from the string, the upper ends of each pair of clips are designed to be engaged by a depressing arm 31 pivoted at one end to the plate 26 and extending across one face thereof and being designed to be forced down into engagement with the inwardly extending upper ends of the clips 28 so as to force such ends together and the lower clamping portions of the clips apart. To force the arm 31 downwardly, I have provided each arm with a rocker 32, the said rockers being respectively mounted upon the respective plates 26 at the upper ends thereof. Each rocker 32 is formed with a cam 32ª which, when the rocker is moved in one direction, is designed to engage and press downwardly upon the upper edge of the subjacent pivoted arm 31 so as to move said arm into engagement with the upper end of the adjoining clips 28, the said upper ends of the clips being thereby moved toward

each other and the lower ends of the clips being spread apart against the tension of their connecting spring 30 so as to release the musical string 6. Each rocker 32 is also formed with a lug 33 adapted to engage the pivot end of the arm 31 when the rocker is moved in a direction to depress said arm and open the clips, thereby constituting a stop to limit the movement of the rocker in that direction. Each rocker is further formed with a finger knob or button 34, these displaying respectively, commencing with the right hand end of the appliance, the following characters # D # E F # G # A # B C. It will thus be understood that when any of these finger knobs is drawn forwardly so as to release the corresponding arm 31 the spring 30 of that pair of clips 28 will be permitted to act to tightly draw the clips into engagement with the string 6 so that striking or vibrating the string in any way between the point at which it is clamped and the bridge 7, will cause the string to sound the note represented by the said button.

Preferably I provide a scale bar 35 which extends parallel with the string 6 between the bridges 7 and 7a. The scale bar and the distance between the bridges 7 and 7a are twenty-six inches. Manifestly then, the rocker 32, the bottom of which displays the character C is placed at the 13″ graduation on the scale bar, denoting an octave higher than the tone produced by the full length vibrating string, and the dampers 28 are arranged between such "C" cam rocker and the bridge 7a at intervals to produce the tones of the chromatic scale.

From the foregoing description, in connection with the accompanying drawings, the operation of my improved tuning appliance will be apparent. In the practical use of the device, the various tones will be sounded by clamping the clips against the string as desired, and as each tone is produced, the instrument will be tuned accordingly, it being only necessary that the person operating the device be capable of determining when two tones are alike, and not necessary that his ear be experienced sufficiently to distinguish gradations in tone, as is necessary when only the ordinary tuning fork is used. As has been before stated, it is only necessary in order to vary the pitch of the appliance to turn the nut 18 in one direction or the reverse whereby to increase or diminish the tension exerted upon the sounding string 6.

It is evident that the device may be easily manufactured and readily assembled and that it will be positive in its action owing to the fact that the clips 28 of each pair are permitted to swing freely when not pressed upon by the arms 31, so that no matter what the exact position of the string may be whether it be crowded either to one side or the other, the clips will still properly clamp the same and produce the proper stopping or clamping effect.

Having thus described the invention, what is claimed as new is:

1. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string and movable freely in a lateral direction with the string while in contact therewith, means tending to draw said clips together into engagement with the string, and means for holding said clips out of engagement with said string.

2. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string, a support to which said clips are pivotally connected, contractile springs connected to said clips and arranged to draw them together, whereby the clips will clamp the spring, and means acting on said clips for holding the clips out of engagement with the string against the tension of the springs.

3. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged to engage said string, supports on which said clips are pivotally mounted, means tending to move the clips into engagement with the string, arms mounted on the respective supports and adapted to engage the clips and press the clips away from the string, and means mounted on said support for pressing said arms into engagement with the clips.

4. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string, a support to which said clips are pivotally connected intermediate of their ends, contractile springs connected to said clips at one end thereof and arranged to draw said ends together whereby the clips will clamp the string, and means acting upon opposite ends of said clips for holding said clips out of engagement with the string against the tension of the springs.

5. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string, supports to which said clips are pivotally connected, means tending to draw said clips together and clamp said string between them, arms mounted on the respective supports and adapted to engage the clips at one end and press the clips away from the string, and means mounted on said supports for pressing said arms into engagement with the clips.

6. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string, means tending to draw said clips together to clamp the string between them, supports on which said clips are movably mounted, arms mounted on the respective supports and arranged to engage the clips and move them in a direction to release the string, and rockers mounted on said supports and arranged to engage the links.

7. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string, means tending to draw said clips together to clamp the string between them, supports on which said clips are movably mounted, arms mounted on the respective supports and arranged to engage the clips and move them in a direction to release the string, and rockers mounted on said supports and arranged to engage the arms, said rockers being provided with finger knobs.

8. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string, means tending to draw said clips together to clamp the string between them, supports on which said clips are movably mounted, arms mounted on the respective supports and arranged to engage the clips and move them in a direction to release the string, and rockers mounted on said supports and arranged to engage the arms, said rockers being provided with stop lugs arranged to limit the movement of the rockers in one direction.

9. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, said means including a frame, a series of transversely extending arched brackets with which the frame is provided, said brackets extending across the opening above the string, clips adapted to engage said string, means for moving the clips into engagement with the string, and supports for said clips, said supports being adjustably connected to said brackets.

10. In an appliance for use in tuning musical instruments, the combination of a musical string, means including a frame for holding said string under tension, the frame being provided with a series of transversely extending brackets, clips arranged to engage the string, and supports for said clips adjustably connected to said brackets.

11. In an appliance for use in tuning musical instruments, the combination of a musical string, means including a frame for holding said string under tension, said frame being provided with a series of transversely extending brackets formed with sockets extending lengthwise of the string, stems secured in the respective sockets, clip supporting plates supported on said stems, and clips carried by said supporting plates and arranged to engage the string.

12. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, clips arranged on opposite sides of said string and disposed at right angles to the length thereof, supports to which the clips are pivotally connected intermediate of their ends, said clips being provided at corresponding ends with hooks, contractile springs engaged in said hooks and tending to draw said clips together, the other ends of said clips extending toward each other, arms pivotally connected to said clip supports and adapted to press upon said last named ends whereby to move the first named ends of the clips away from each other, and means for pressing the arms down upon the adjoining ends of the clips.

13. In an appliance for use in tuning musical instruments, the combination of a musical string, means for holding said string under tension, a clip arranged to engage said string, means for yieldingly holding said clip in engagement with said string and for permitting said clip to move laterally and with the string while in such engagement, and means for holding the clip out of engagement with the string.

In testimony whereof I affix my signature in presence of two witnesses.

FRED HUGGINS. [L. S.]

Witnesses:
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T. M. MALTBIE.