

N. TURTURRO.
 STRINGED MUSICAL INSTRUMENT.
 APPLICATION FILED DEC. 6, 1906.

937,121.

Patented Oct. 19, 1909.
 4 SHEETS—SHEET 2.

Fig. 5.

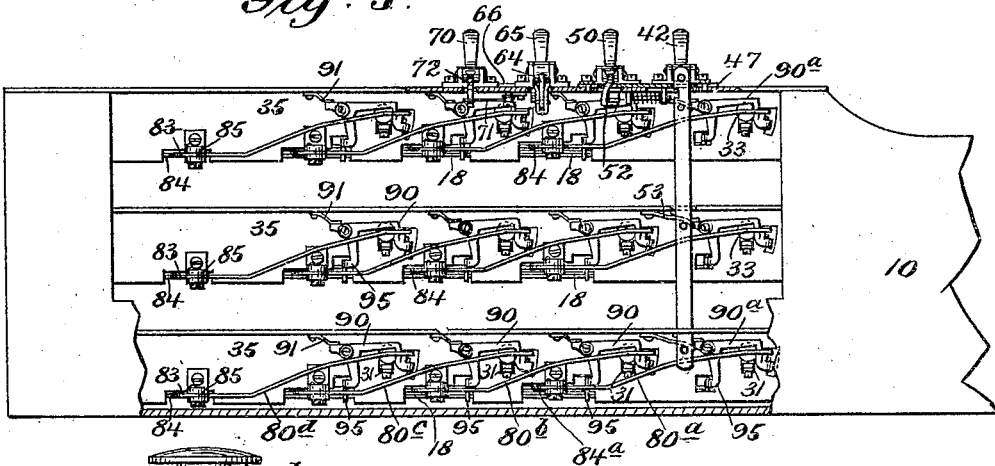


Fig. 6.

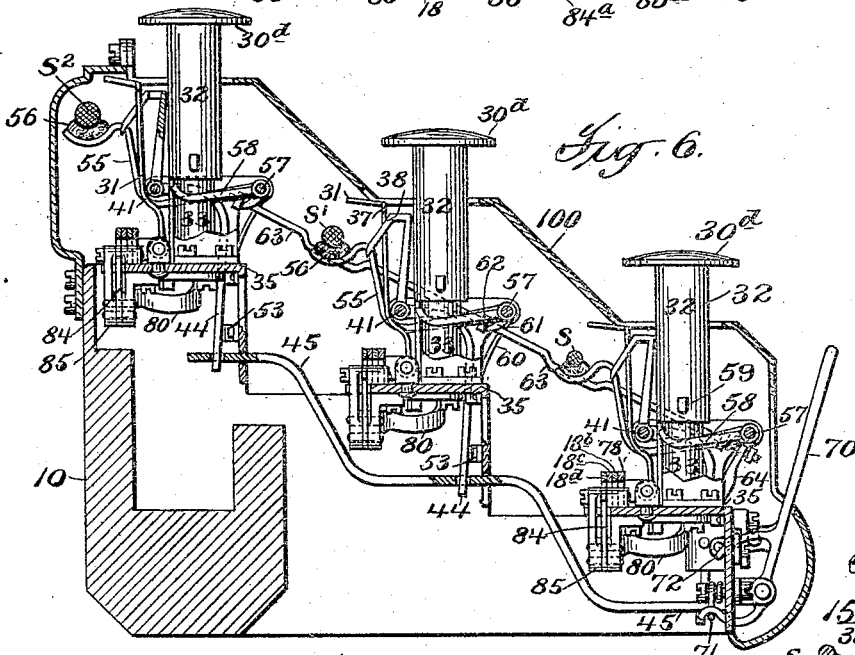


Fig. 13.

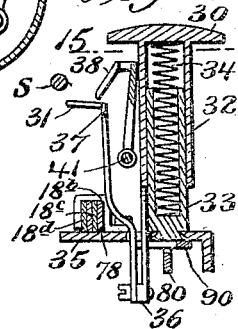


Fig. 9.

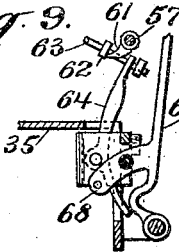


Fig. 12.

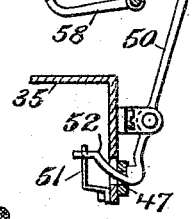


Fig. 11.

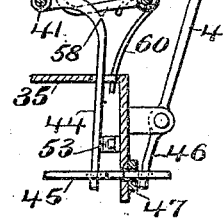


Fig. 10.



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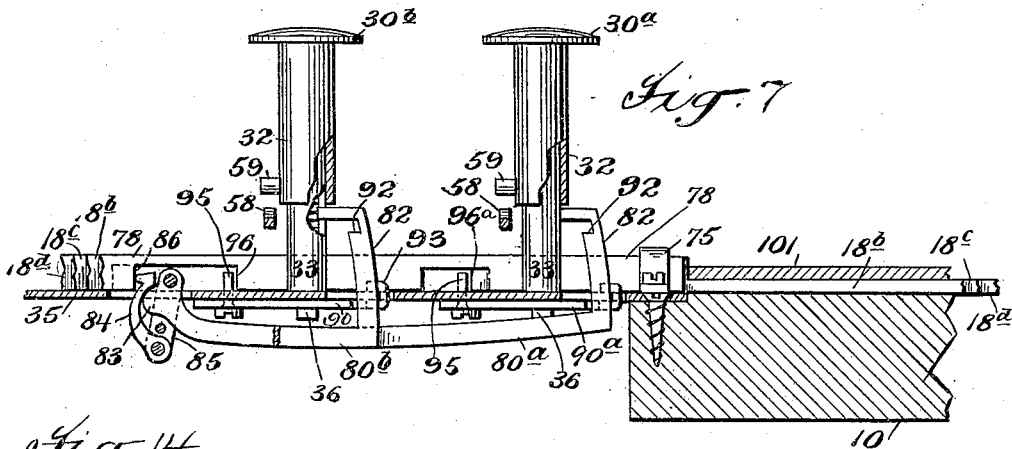


Fig. 14.

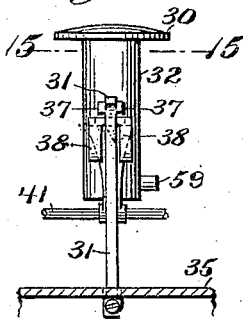


Fig. 15.

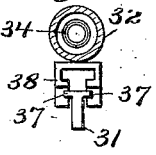


Fig. 8.

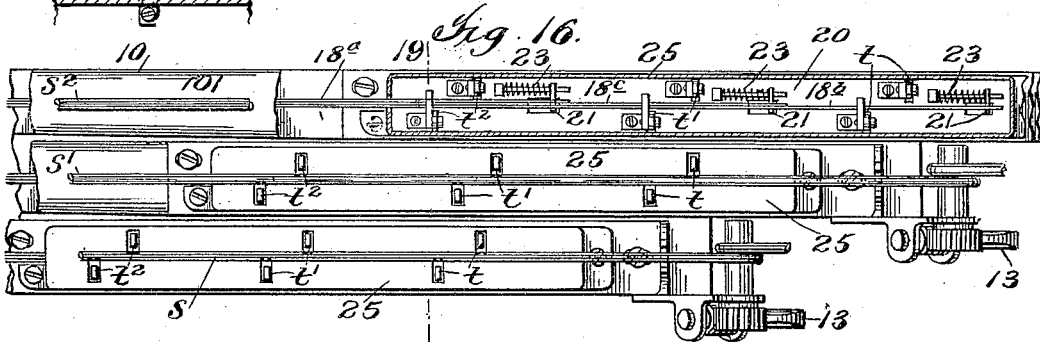
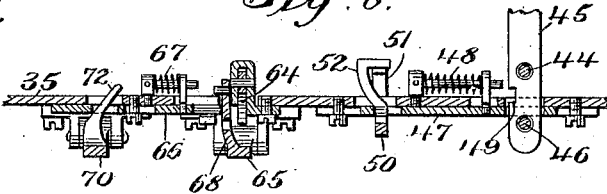


Fig. 16.

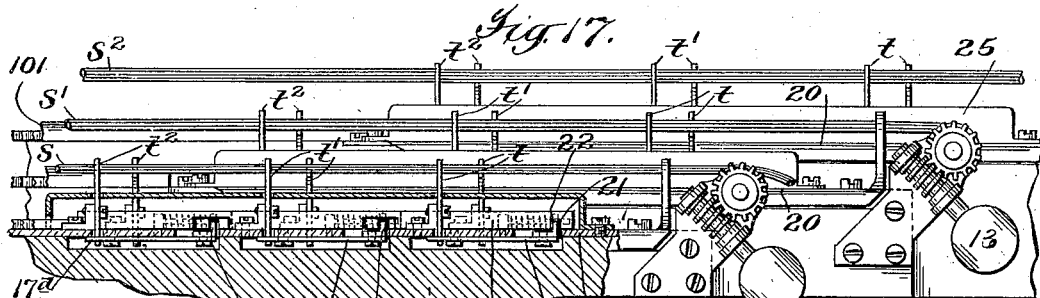


Fig. 17.

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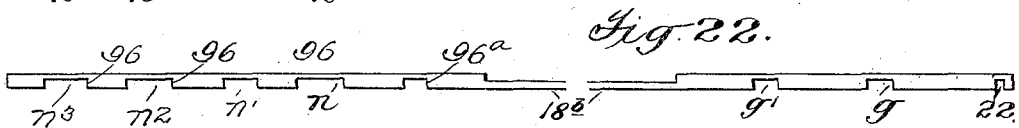
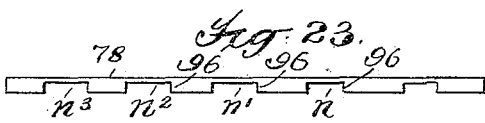
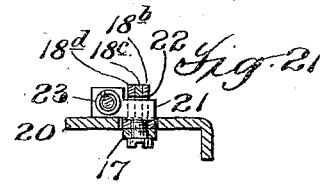
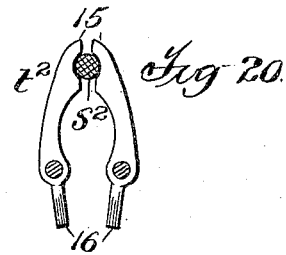
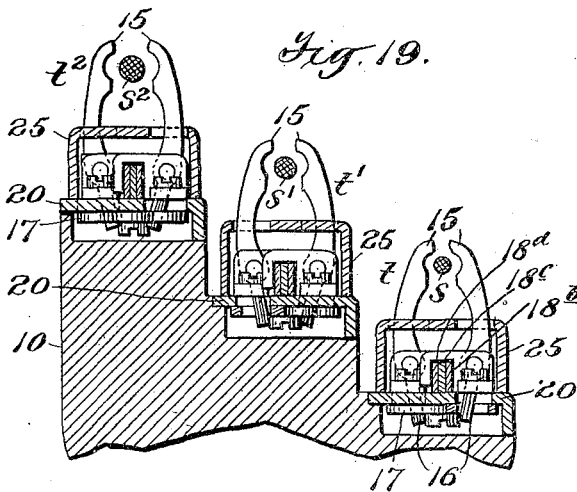
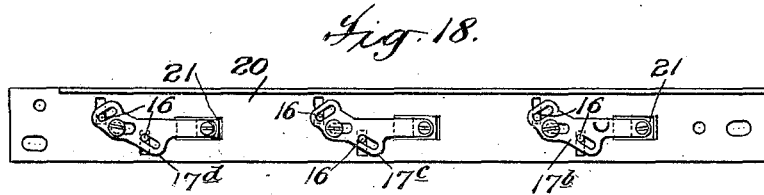
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4 SHEETS—SHEET 4.



Witnesses
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UNITED STATES PATENT OFFICE.

NICOLA TURTURRO, OF MOUNT VERNON, NEW YORK.

STRINGED MUSICAL INSTRUMENT.

937,121.

Specification of Letters Patent.

Patented Oct. 19, 1909.

Application filed December 5, 1905. Serial No. 290,497.

To all whom it may concern:

Be it known that I, NICOLA TURTURRO, a subject of the King of Italy, residing at Mount Vernon, county of Westchester, and State of New York, have invented certain new and useful Improvements in Stringed Musical Instruments, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in guitars and similar stringed musical instruments which are played by picking the strings with one hand while the other hand is employed in stopping the strings for producing various desired tones.

The object of the invention is to increase the compass or range of tones of the instrument, especially by adding to the usual available tones of the instrument a number of bass tones lower than those which the instrument is capable of producing without my invention.

The invention aims further to secure the above object by means of an attachment which may be applied to existing instruments and readily attached to and removed therefrom.

The invention aims further to provide means whereby the additional tones may be produced solely by the use of the thumb of the right or playing hand, without adding anything whatever to the duties of the left hand of the player and without regard to the position of the player's left hand.

A full understanding of the invention can best be given by a detail description of a preferred construction embodying all the features of the invention in a preferred form, and such a description will now be given in connection with the accompanying drawings showing the invention as embodied in an attachment for a guitar.

In said drawings: Figure 1 is a face or plan view of a guitar provided with my improved attachment. Fig. 2 is a side view looking in the direction of the arrow 2 of Fig. 1. Fig. 3 is a plan view of the body or playing end of the attachment, the protecting casing being removed and parts broken away in order to show the construction more clearly. Fig. 4 is a side view of the playing end of the attachment, the protecting casing being partly broken away. Fig. 5 is a bottom plan view of the playing end of the attachment. Figs. 3, 4 and 5 are drawn

to about actual size. Fig. 6 is a section on line 6 of Figs. 3 and 4 on a still further enlarged scale. Fig. 7 is a detail sectional view taken on line 7 of Fig. 3. Fig. 8 is a detail sectional view taken on line 8 of Fig. 4. Fig. 9 is a detail view of the damper throwing lever and connections. Fig. 10 is a detail view of one of the damper levers. Fig. 11 is a detail view of the lever and connections for operating the means for increasing the strength of action of the pickers. Fig. 12 is a detail view of the releasing lever by which the picker guides are allowed to return to normal position. Figs. 13, 14 and 15 are detail views of one of the finger keys and the picker actuated thereby and the picker guide. Figs. 16 and 17 are respectively plan and side views on the scale of Figs. 3 to 5 of the end of the attachment which lies near the head of the instrument showing the stop fingers for changing the sounding length of the strings, part of the projecting casing being broken away. Fig. 18 is a detail bottom plan view on the same scale showing means for actuating the stop fingers for one of the strings. Fig. 19 is a section on line 19 of Figs. 16 and 17 on the scale of Fig. 6. Fig. 20 is a detail view of a pair of stop fingers. Fig. 21 is a detail view showing the connection for the spring acting on one of the stop finger actuating rods. Fig. 22 is a view partly broken away of one of the stop finger actuating rods. Fig. 23 is a view of one of the releasing rods hereinafter described.

Referring to the drawings, A represents the body of a guitar of the usual form having a neck B and provided with the usual number of strings *a* extending from the bridge *b* to the head *b'*, the neck being provided with the usual frets *b²* against which the strings are pressed by the fingers of the player's left hand for changing the sounding lengths of the strings.

s, *s'* and *s²* represent three supplemental strings for producing bass tones lower than the lowest tones which can be produced by the regular strings *a*. These supplemental strings are preferably mounted on a removable bar or supplemental neck 10 which is detachably secured at one end to the bridge of the guitar, as by means of screws 11, and at the other end is secured to the head of the guitar by means of a bracket 12 which is detachably connected to the head of the guitar. The supporting bar also carries the

finger keys and stop fingers and the various actuating and connecting mechanisms for picking the supplemental strings and for changing their sounding lengths, and also the damping keys and mechanism and the keys and mechanism for increasing the strength of operation of the pickers. The supporting bar 10 and the various parts carried thereby will thus form an attachment which may be applied to and removed from the guitar at will, the guitar without the attachment being merely an ordinary instrument of its kind.

The supplemental strings may be secured at the body end of the bar 10 in any suitable manner, and are secured at the head end of the bar to tension devices, as spindles adapted to be turned by finger keys 13, such as are usually employed for putting the desired tension on strings in guitars.

For changing the sounding lengths of the supplemental strings so that each string may be employed for producing a plurality of tones, one or more stopping devices are provided for each string. As shown, there are provided three stopping devices *t*, *t'* and *t''* for each string so that each string may be caused to produce four tones, that is, the one corresponding to its full length and three other tones corresponding to the sounding lengths of the string produced by the operation of its three stopping devices. The three supplemental strings will thus give 12 tones, and when properly tuned and with the stopping devices properly placed will thus give the notes of a full chromatic scale, this increasing the range of the instrument by a full octave for all keys in which it may be played.

The stopping devices for changing the sounding lengths of the supplemental strings are preferably formed by pairs of upwardly projecting pivoted stop fingers 15, the two fingers of each pair extending on opposite sides of and normally clear of the string, as shown in Fig. 19, and being thrown toward each other to engage the string as shown in Fig. 20 when actuated to stop the string or change its sounding length. For actuating these stop fingers to engage and release the strings each finger is provided with a downwardly extending tail or projection 16, the projections 16 of each pair of stop fingers extending into oppositely inclined cam slots in a sliding cam plate 17. For each string there are three cam plates, 17^b, 17^c and 17^d, 17^b being the cam plate for actuating the stop fingers forming the stopping device *t*, 17^c being the cam plate for actuating the stop fingers forming the stopping device *t'*, and 17^d being the cam plate for actuating the stop fingers forming the stopping device *t''*. These cam plates are slid for actuating the stop fingers by means of actuating rods 18^b, 18^c and 18^d, respectively. The

cam plates 17 are preferably mounted on the under side of a supporting plate 20 over the upper side of which plate extends the actuating rods 18, these rods being preferably flat metal rods standing on edge side by side.

The connection between each cam plate and its corresponding actuating rod is effected by means of a projection or lug 21 on the cam plate extending upwardly through an opening in the supporting plate 20 and into a notch 22 in the actuating rod so that by the movement of the rod the cam plate will be slid to actuate the stopping fingers. The actuating rods 18 are held in normal position, as shown in Figs. 16 and 17, by means of springs 23 acting on the lugs 21, and when in this position the cam plates are in position, as shown in Fig. 18, to hold the stop fingers in their open or inoperative position, as shown in Fig. 19. When one of the actuating rods is moved endwise to the left of Figs. 16 and 17, that is, toward the body end of the supporting bar 10, the corresponding cam plate will be moved to throw the corresponding pair of stop fingers into operative position, as shown in Fig. 20. The operating rods extend to and are actuated from the body end of the attachment by means which will be hereinafter described.

The actuating bar 18^b is cut away at *g* in order to clear the lug 21 extending upward from the cam plate 17^c to engage the actuating bar 18^c, and the actuating bars 18^b and 18^c are cut away at *g'* in order to clear the lug 21 extending upward from the cam plate 17^d for engagement with the actuating bar 18^d. The ends of the actuating bars and connections are preferably covered by protecting casings 25, as shown.

For sounding the supplemental strings, a plurality of finger keys 30 are provided for each string, four finger keys 30^a, 30^b, 30^c and 30^d being provided for each string in the construction shown. Any suitable picking means may be provided to be actuated by the finger keys, but preferably there are provided four pickers, 31^a, 31^b, 31^c and 31^d for each string, each of which is operated independently of the others by its corresponding finger key. The finger keys 30, as shown, are each formed of a finger piece and a tubular stem 32 which is mounted to slide on a vertically arranged stud 33 and held in its normal raised position by means of a spring 34, the studs 33 being mounted on supporting plates 35. The pickers 31 are each carried by one of the finger keys 30 and are arranged so as to strike the strings when moved downward by the downward movement of the finger keys and to move clear of the string on their upward movement. For this purpose the pickers are arranged to have a slight horizontal movement, as by be-

ing formed of spring fingers carried by downward extensions 36 of the finger keys 32, the upper end of such spring fingers being bent to form the picker proper and being provided with shoulders 37 adapted to engage inclined guides 38 between which the spring finger moves and by which it is forced forward on its downward movement into position to engage the string. When a picker has been moved downward so as to carry the shoulders 37 below the guides 38 the picker will spring back to the position shown in Fig. 13, thereby releasing the string and taking a position such that its shoulders 37 will engage the under side of the guides 38 on the upward or return movement of the picker whereby the picker will be caused to move clear of the string. When the picker has been returned to its normal position, the shoulders 37 will have moved above the guides 38 and the picker will have sprung outward again to the position shown in Fig. 6 so that when next moved downward the shoulders 37 will again engage the upper face of the guides 38 and the picker will be forced outward to engage the string.

To provide for varying the strength of the picking action of the pickers, the several sets of guides 38 are arranged so that they may be moved horizontally for the purpose of throwing the picker forward toward the string a greater or less distance. For this purpose the pairs of guides 38 for the four pickers for each string are carried by a rock shaft 41 by the rocking of which the guides 38 may be moved horizontally toward the string from their normal position as shown in the drawings. For the purpose of rocking the shafts 41 for shifting the picker guides, there is preferably provided an operating finger key or lever 42, and the rock shafts 41 are each provided with a downwardly extending arm 44 which connects with an actuating rod 45, which rod 45 is also connected with a downward extension 46 of the finger lever 42, so that when the lever is thrown inward from the position shown in Fig. 11 the actuating rod will be moved to the right (see Figs. 6 and 11) thereby rocking the shafts 41 so as to throw the picker guides 38 forward to cause the pickers when depressed to project farther over the strings and thereby to cause a stronger picking action and consequently to cause the production of a louder tone. In order that the picker guides when moved into position for increasing the strength of action of the pickers shall remain in this position until released, a sliding latch 47 is provided, which, when the finger lever 42 has been moved inward to throw the picker guides forward as just described, moves to the right in Figs. 4 and 8 under the action of a spring 48 (see Fig. 8) to engage a shoulder 49 on the rod 45. For retracting the

latch 47 to release the rod 45 and permit the picker guides to return to normal position, a releasing finger key or lever 50 is provided (see Figs. 8 and 12) which is normally held in the position shown by means of a spring 51 and is provided with a cam extension 52, which when the lever is thrown inward engages the sliding latch 47 and moves it against the tension of its spring 48 to release the rod 45. When the rod 45 is thus released, the shafts 41 will be rocked to return the picker guides to their normal position by means of a suitable spring or springs, as the springs 53.

For damping the string after a note has been sounded, a damper formed by a pivoted lever 55 carrying a suitable damping pad 56 is provided for each of the supplemental strings. The damping lever for each string is carried by a rock shaft 57, each of which shafts carries also a series of rocking arms 58, one for each of the four finger keys, extending in position to be engaged by lugs 59 on the finger key stems, so that when any finger key is depressed its lug 59 will engage one of the arms 58, thereby rocking the shaft 57 to carry the damping pad 56 out of engagement with the string, as shown in Fig. 10. When the finger key is released and raised again, the shaft 57 is allowed to rock in the opposite direction under the tension of a spring 60 to carry the damping arm and pad back to their damping position, as shown in Fig. 6. To provide for simultaneously throwing all the dampers out of operation so as to permit free vibration of the strings, each of the rock shafts 57 is provided with a short arm 61 which is adapted to engage with a shoulder 62 on a pull rod 63 so that when the rod is moved to the right in Fig. 6 the shafts 57 will be rocked to carry all the dampers down to an inoperative position as shown in Fig. 10. When the pull rod 63 is in the position as shown in Fig. 6, each of the rock shafts will be free to be rocked by the depression of a finger key as above described for the purpose of momentarily moving one of the dampers away from its string. The pull rod 63 is moved endwise to the right in Fig. 6 for throwing the dampers out of operation by means of a lever 64 (see Figs. 6 and 9), the upper end of which is connected to the pull rod and the lower end of which extends in position to be engaged by a finger lever 65 and to be thrown inward to give the pull rod 63 its actuating movement when the finger lever 65 is thrown inward to the position shown in Fig. 9.

For holding the dampers in their thrown off or inoperative position, a sliding latch 66 is provided which tends to move to the right in Fig. 8 under the pressure of a spring 67 so that when the finger lever 65 has been moved into the position shown in Fig. 9, thereby throwing the dampers out of en-

gagement with the strings, the latch 66 will move to cause the end thereof to enter an opening in an ear 68 on the finger lever 65 and to thereby hold the finger lever in the position shown in Fig. 9. For effecting the return of the dampers to operative position, a releasing lever 70 is provided, which is normally held in the position shown in Fig. 6 by means of a spring 71 engaging the tail of the lever, and which is provided with a cam projection 72 adapted to engage the latch 66 when the finger lever 70 is thrown inward from the position shown in Fig. 6 and to thereby retract the latch and release the finger lever 65, whereupon the shafts 57 will be rocked under the tension of their springs 60 to retract the pull rod 63 and to return the dampers to operative position.

Each of the four finger keys provided for each of the supplemental strings is intended to cause the sounding of a different tone, the depression of the finger key 30^a of each series causing its corresponding string to sound the tone corresponding to its full length, and each of the other finger keys of each series being connected to operate one of the stop finger actuating rods 18 when depressed to operate its picker, the depression of the finger key 30^b causing the actuating rod 18^b to be moved to close the stop fingers 15 of the stopping device *t*, and the depression of the finger keys 30^c and 30^d, respectively, causing the rods 18^c and 18^d to be moved to close the stop fingers of the stopping devices *t'* and *t''* respectively.

As before stated, the actuating rods 18^b, 18^c and 18^d extend from the head end of the supporting bar 10 to the body end thereof, and the actuating bars for each string are positioned at the body end of the instrument by suitable guides, as the guides 75 and 76, as shown. For each string there is also provided at the body end of the attachment a releasing bar 78 which is slidably mounted within the guides 75 and 76 against the bar 18^b, which bar 78 does not extend to the head end of the attachment, and the object of which will be explained hereinafter. The actuating bars are normally held in the position shown in the drawings by the springs 23 at the head end of the attachment as heretofore explained, the stop fingers 15 being opened as shown in Fig. 19 when the actuating bars are in this position.

For moving the bars against the tension of the springs 23 for causing the stop fingers to close against the string in the manner hereinbefore described, there is preferably provided for each series of actuating bars a series of pivoted operating levers 80^b, 80^c and 80^d provided with upwardly projecting ends 82 extending in position to be engaged by the stems 32 of the finger keys 30^b, 30^c and 30^d respectively, the upwardly projecting end of the lever 80^b extending into posi-

tion to be engaged by the finger key 30^b, and the upwardly projecting ends of the levers 80^c and 80^d extending into position to be engaged by the fingers keys 30^c and 30^d respectively. These operating levers each have a cam shoulder 83 by which a short lever 84 pivoted on a stationary support 85 is actuated when the operating lever is depressed. Each of the levers 84 engages a shoulder 86 on one of the actuating rods 18 so that when any one of the operating levers 80^b, 80^c or 80^d is depressed the corresponding actuating rod 18^b, 18^c or 18^d will be moved to the right in Figs. 3, 4, &c., that is, against the tension of its spring 23. The depression of any one of the finger keys 30^b will thus cause the stop fingers 15 forming the stopping device *t* of the corresponding string to be actuated to change the sounding length of the string, and similarly the depression of any one of the finger keys 30^c or 30^d will cause the corresponding stopping devices *t'* or *t''* to be actuated. The shoulders 86 on the actuating bars 18^b, 18^c and 18^d are preferably formed by notches *n'*, *n''* and *n'''* respectively. These notches for forming the shoulders 86 on the several actuating bars do not register with each other, but are formed at different points longitudinally of the bars. To accommodate the ends of the levers 84 and the pivotal portion of the levers 80 and the mountings therefor, at the point where these notches occur the other two of the actuating levers, as also the releasing lever 78, are formed with corresponding notches *n'*, *n''* and *n'''*, which, however, are extended farther to the left in Figs. 3, 4, &c., so as to permit the lever 84 to engage the shoulder 86.

If the actuating bars after having been moved to effect the operation of the stopping devices were allowed to return to normal position when the finger key was released, the sounding length of the string would thereby be restored to the full length of the string, and if the string continued to vibrate the tone produced by such continued vibrations might be different from that first produced by the operation of the finger key. To avoid this, means are provided for holding the actuating bars in the position to which they have been moved after the releasing of the finger key and until another finger key in the same series is depressed. For this purpose a spring pressed pivoted catch 90 is provided for each of the operating levers 80, which when the operating lever is depressed is thrown by its spring 91 into position to engage a shoulder 92 on the upward extension 82 of the operating lever to hold the lever in its depressed position and thereby retain the actuating bar in the position to which it has been moved by the depression of the operating lever. These catch levers are mounted in the under side of the supporting plates 35, and as shown are held in position

at their operating ends by means of a lip 93 projecting through an opening in the plate 35 and turned down over the upper side of the plate.

5 It is necessary that an actuating bar which has been moved to operate its stopping device and then held by its catch lever 90 shall be released when another finger key of the same series is depressed. This result is secured on the depression of the finger keys 10 30^b, 30^c and 30^d by means of the movement of the actuating bars moved by such finger keys. As there is no stop finger actuating bar corresponding to the finger key 30^a of 15 each series, however, since these finger keys act to cause full length vibration of the strings, the releasing bars 78 are provided to perform the releasing operation when these keys are depressed. Each of such releasing 20 bars is moved against the tension of a spring 79 by the depression of the corresponding finger key 30^a through the operation of a lever 80^a acting on a lever 84 which engages a shoulder 86 on the releasing bar in the same 25 manner that the actuating bars are operated by the levers 80^b, 80^c and 80^d. The shoulder 86 on the releasing bar 78 is also formed by a notch *n* in its lower edge of the bar, the actuating bars being also formed 30 with corresponding notches which are extended farther to the left in Figs. 3, &c., to permit of the operative engagement of the lever 84 with the shoulder 86 of the releasing bar.

35 For causing the release of any one of the actuating bars by the movement of either of the other two actuating bars or of the releasing bar, the catch levers 90 are each provided with an arm 95 the end of which 40 extends into position to be engaged by shoulders 96 on the actuating bars and releasing bar, such shoulders being preferably formed at the right hand end of the notches *n*, *n'* and *n*², as shown. The ends of the releasing 45 arms 95 of the catch levers 90 extend across the path of the three actuating bars and the releasing bar so as to be engaged by a shoulder 96 on any one of the said bars, but as the catch lever for holding the lever 80 for 50 operating each of the actuating bars must be free to engage such operating lever when it is depressed, each actuating bar will not be provided with a shoulder 96 for engaging the releasing arm of its corresponding 55 catch lever. For each releasing arm 95, therefore, there will be an engaging shoulder on the releasing bar and on two of the actuating bars, the notch *n*, *n'* or *n*² of the other actuating bar being extended to the right in 60 the drawings so that such bar when moved by its operating lever will not engage the releasing arm of its corresponding catch lever. A catch lever 90^a may also be provided, as shown, for engaging the upward 65 extension 82 of the operating lever 80^a to

hold the releasing bar in the position to which it has been moved, and this catch lever will also be provided with a releasing arm 95 for engaging shoulders 96^a on the actuating bars.

The various operating devices at the body 70 end of the attachment are preferably protected by a suitable casing 100, which is preferably formed of sheet metal, and the actuating bars 18 between the head and body 75 ends of the attachment are protected by cover plates 101.

The use of the attachment and the operation of its various parts will be understood from the foregoing description, and need 80 not be further described. It may be pointed out again, however, that the production of the various tones from the supplemental strings and the controlling of the loudness 85 of the tones and their character in regard to their being sustained or damped notes may be effected entirely by the use of the thumb of the player's right or playing hand. It will be understood, however, that features of the invention might be embodied in instru- 90 ments or attachments intended to be operated by other fingers of the player's hand. It will be understood also that the invention is not to be limited to the exact construction and arrangement of parts as shown and to 95 which the foregoing description has been mainly confined, but that it includes changes and modifications thereof within the claims. It will be understood also that while the invention is preferably embodied in an attach- 100 ment which may be applied to and removed from the instrument with which it is to be used, and this idea forms a feature of the invention, yet the invention is not to be limited in all its features to a removable at- 105 tachment.

What is claimed is:—

1. The combination with a stringed musical instrument of the class described, of one or more supplemental strings, and means 110 for picking said supplemental strings located adjacent to the main strings of the instrument in position to be operated by the thumb of the player's playing hand while said hand is in position to finger the main 115 strings, substantially as described.

2. The combination with a stringed musical instrument of the class described, of a supplemental string, a stopping device for 120 changing the sounding length of said supplemental string, and means for actuating said stopping device located adjacent to the main strings of the instrument at the body or playing end of the instrument in position 125 to be operated by the player's playing hand while said hand is in position to finger the main strings, substantially as described.

3. The combination with a stringed musical instrument of the class described, of a supplemental string, a stopping device for 130

changing the sounding length of the supplemental string, and means for actuating the stopping device located adjacent to the main strings of the instrument in position to be operated by the thumb of the player's playing hand while said hand is in position to finger the main strings, substantially as described.

4. The combination with a stringed musical instrument of the class described, of one or more supplemental strings, means for picking said strings, stopping devices for changing the sounding length of said strings, and means for actuating said picking means and said stopping devices located adjacent to the main strings of the instrument in position to be operated by the thumb of the player's playing hand while said hand is in position to finger the main strings, substantially as described.

5. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of playing keys for said string located adjacent to the main strings of the instrument in position to be operated by the thumb of the player's playing hand while said hand is in position to finger the main strings, and means controlled by said keys for changing the sounding length of said supplemental string, substantially as described.

6. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys located adjacent to the main strings of the instrument in position to be operated by the player's playing hand while said hand is in position to finger the main strings, means actuated by said finger keys for picking said supplemental string, and means controlled by said finger keys for changing the sounding length of said supplemental string, substantially as described.

7. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys located adjacent to the main strings of the instrument in position to be operated by the player's playing hand while said hand is in position to finger the main strings, a picker actuated by each of said finger keys for picking said supplemental string, and means controlled by said finger keys for changing the sounding length of said supplemental string, substantially as described.

8. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys located adjacent to the main strings of the instrument in position to be operated by the player's playing hand while said hand is in position to finger the main strings, means actuated by said finger keys for picking said supplemental string, a stopping device at the head end of the instrument for changing the

sounding length of said supplemental string, and means for actuating said stopping device when one of the finger keys is operated, substantially as described.

9. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys, means actuated by said finger keys for picking said string, a plurality of stopping devices for changing the sounding length of said string, means for actuating and latching said stopping devices controlled by the movement of said finger keys, and means for releasing the stopping device which has been actuated by any finger key when another finger key is operated, substantially as described.

10. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys, means actuated by said finger keys for picking said string, a stopping device for changing the sounding length of said string, means for actuating and latching said stopping device when one of said finger keys is operated, and means for releasing said stopping device when another of said finger keys is operated, substantially as described.

11. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys, means actuated by said finger keys for picking said string, means controlled by said finger keys for changing the sounding length of said string, a damping device, a finger key for throwing said damping device out of operation, and a key for returning the damping device to operative position, substantially as described.

12. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys, means actuated by said finger keys for picking said string, a damping device normally in engagement with said string, means for moving said damping device momentarily out of engagement with said string when any one of the finger keys is operated, and means for throwing said damping device out of operation and for returning it to operative position at will, substantially as described.

13. The combination with a stringed musical instrument of the class described, of a supplemental string, a finger key, means controlled by said finger key for picking the supplemental string, means for causing a stronger action of the picking means, a finger key for throwing said last mentioned means into operation, and a finger key for throwing said last mentioned means out of operation, substantially as described.

14. The combination with a stringed musical instrument of the class described, of a supplemental string, a finger key, a picker

31 operated by said finger key for picking said string, a guide 38 for guiding the picker on its picking movement, and means for moving the guide 38 toward and away from the string for causing a stronger or weaker action of the picker, substantially as described.

15. The combination with a stringed musical instrument of the class described, of a supplemental string, a plurality of finger keys, means controlled by said finger keys for picking said string, means controlled by said finger keys for changing the sounding length of said string, means for causing a stronger action of the picking means, a finger key for throwing said last mentioned means into operation, and a releasing key for throwing said last mentioned means out of operation, substantially as described.

16. The combination with a stringed musical instrument of the class described, of one or more supplemental strings, a plurality of finger keys for each of said strings located adjacent to the main strings of the instrument in position to be operated by the player's playing hand while said hand is in position to finger the main strings, pickers operated by said finger keys, means operated by said finger keys for changing the sounding length of said supplemental string or strings, and means for causing said pickers to project more or less over the strings in making their picking movements for producing louder or softer tones, substantially as described.

17. The combination with a stringed musical instrument of the class described, of a removable attachment therefor comprising one or more supplemental strings, and means for picking said supplemental string or strings located adjacent to the main strings of the instrument in position to be operated by the thumb of the player's playing hand while said hand is in position to finger the main strings, substantially as described.

18. The combination with a stringed mu-

sical instrument of the class described, of a removable attachment therefor comprising one or more supplemental strings, a stopping device or devices for changing the sounding length of said supplemental string or strings, and means located adjacent to the main strings of the instrument at the body or playing end thereof for actuating said stopping device or devices, substantially as described.

19. The combination with a stringed musical instrument of the class described, of an attachment for providing supplemental strings for the instrument comprising one or more strings, means for picking said strings, stopping devices for changing the sounding length of said strings, and means for actuating said picking means and said stopping devices located to be adjacent to the main strings of the instrument in position to be operated by the thumb of the player's playing hand while said hand is in position to finger the main strings.

20. The combination with a stringed musical instrument of the class described, of an attachment for providing a supplemental string for the instrument comprising a string, a plurality of finger keys located to be adjacent to the main strings of the instrument in position to be operated by the player's playing hand while said hand is in position to finger the main strings of the instrument, means actuated by said finger keys for picking said supplemental string, means controlled by said finger keys for changing the sounding length of said supplemental string, and means for detachably securing the attachment to the instrument.

In testimony whereof, I have hereunto set my hand, in the presence of two subscribing witnesses.

NICOLA TURTURRO.

Witnesses:

A. L. KENT,
J. A. GRAVES.