C. H. & R. W. WEAVER.

MECHANICAL FINGERING DEVICE FOR STRINGED MUSICAL INSTRUMENTS.

APPLICATION FILED JAN. 9, 1911.

1,094,038.

Patented Apr. 21, 1914.

4 SHEETS—SHEET 1.

Fig. 1.

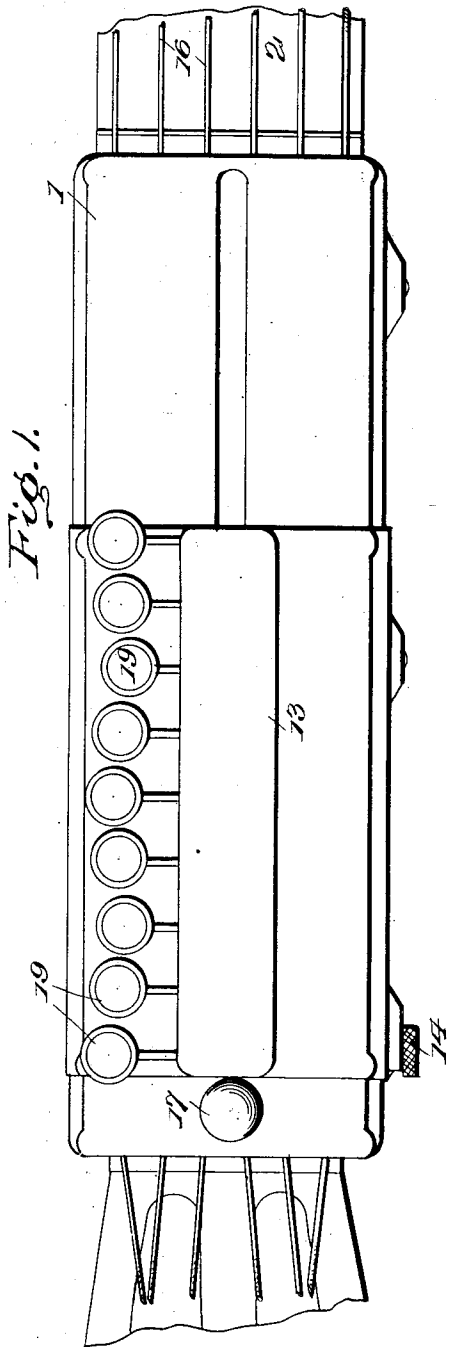
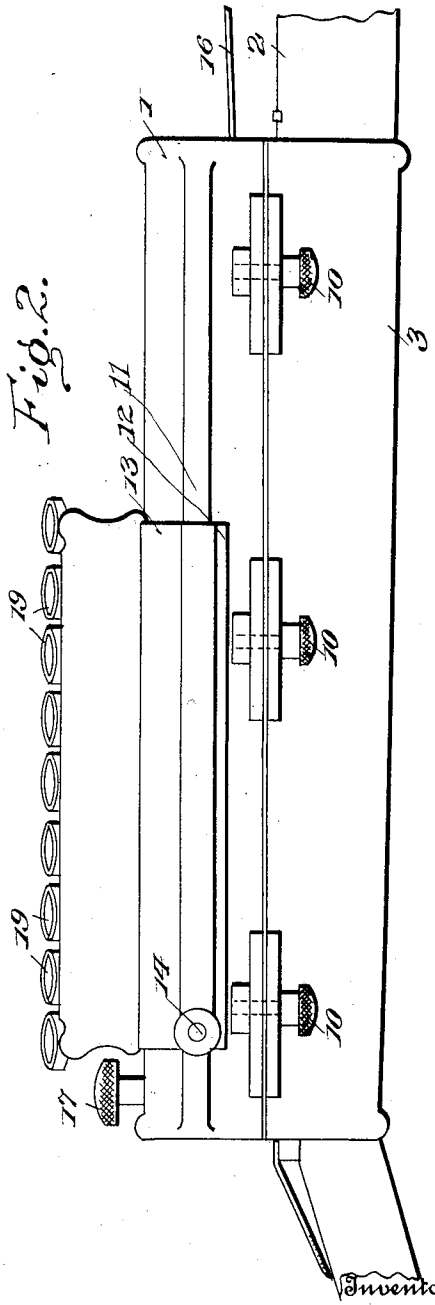


Fig. 2.



Witnesses

W. A. Williams

S. W. Cook

Inventors

R. W. Weaver.

C. H. Weaver.

By Wm. C. R. W. Intire

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

C. H. & R. W. WEAVER.

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Fig. 3.

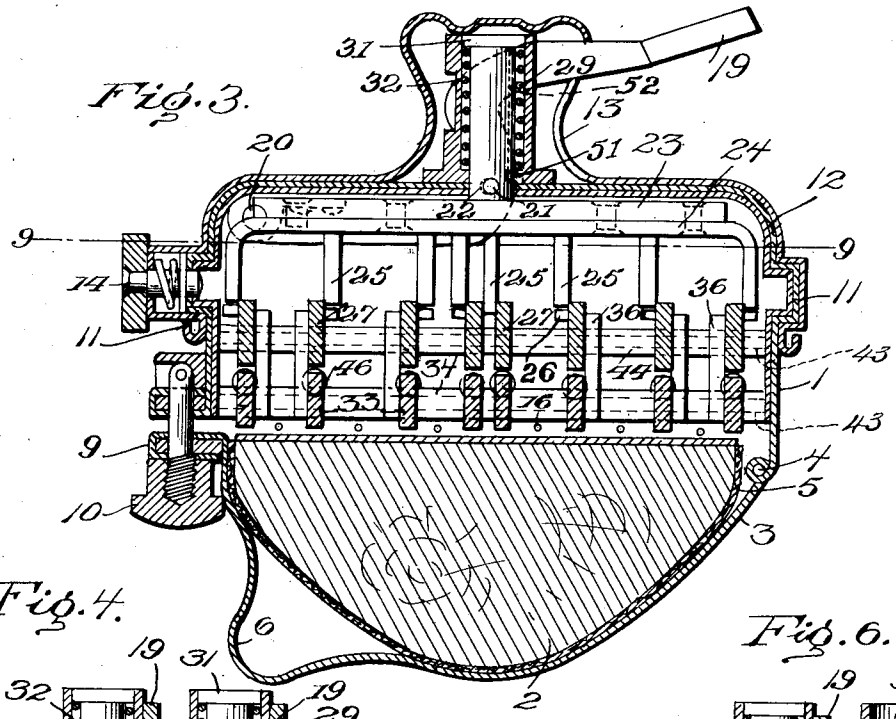


Fig. 4.

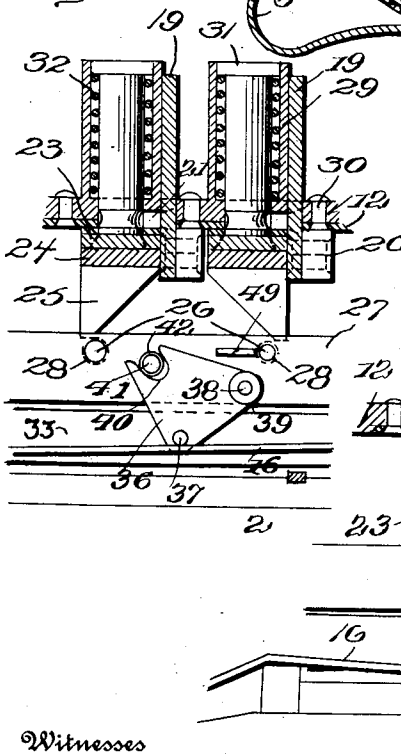


Fig. 5.

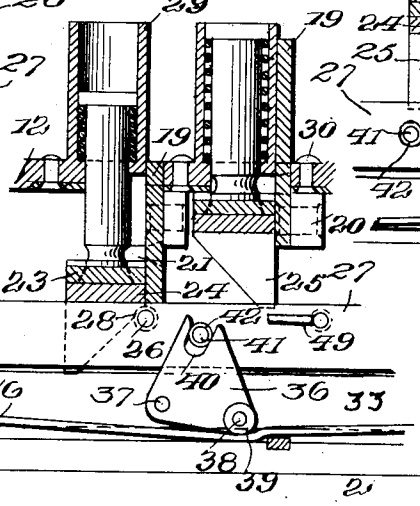
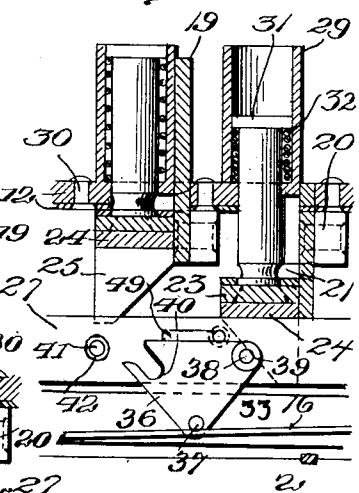


Fig. 6.



Witnesses

W. A. Williams.

S. E. Coots

Inventors

R. W. Weaver.

C. H. Weaver.

By Wm. C. R. W. Entire

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

C. H. & R. W. WEAVER.

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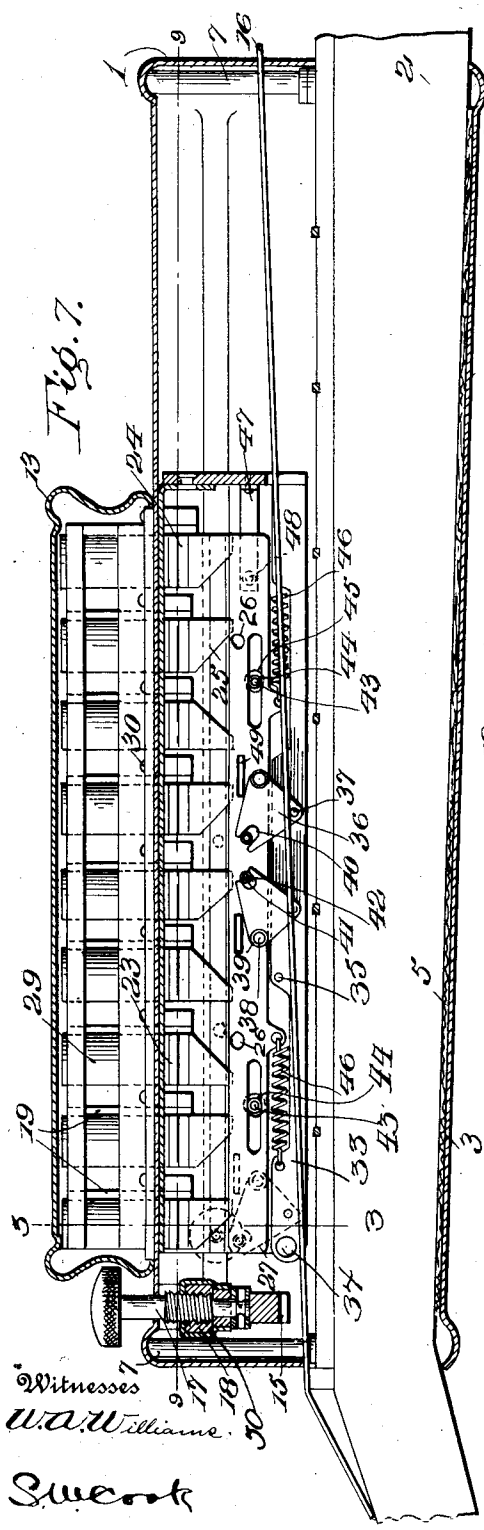


Fig. 7.

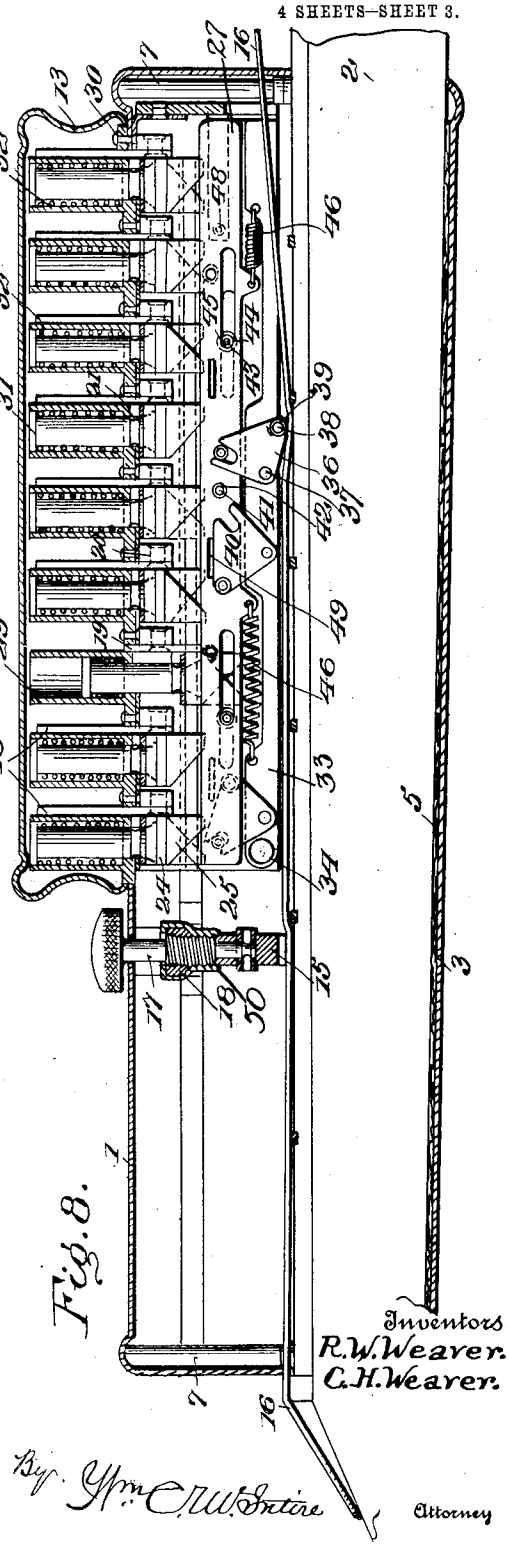


Fig. 8.

Witnesses

W. A. Williams.

S. W. Cook

Inventors

R. W. Weaver.

C. H. Weaver.

By Wm. C. Whittemore

Attorney

C. H. & R. W. WEAVER.

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APPLICATION FILED JAN. 9, 1911.

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4 SHEETS—SHEET 4.

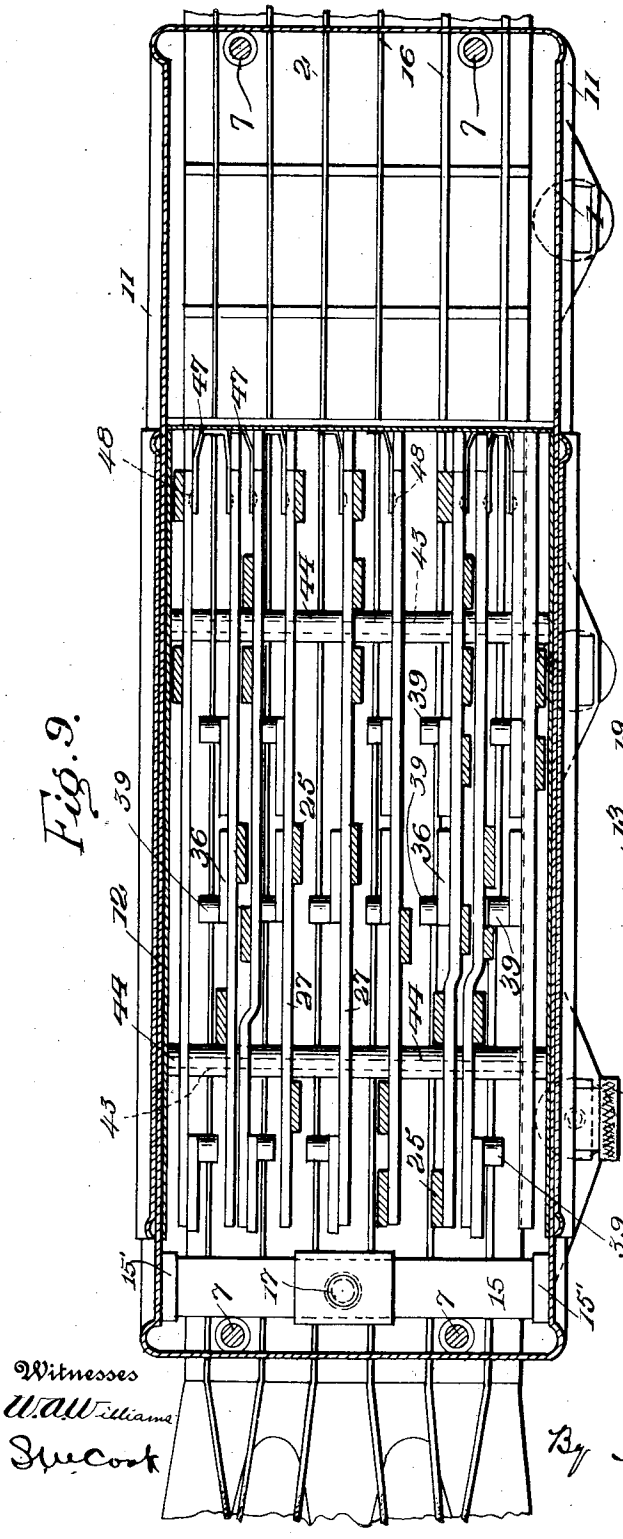


Fig. 9.

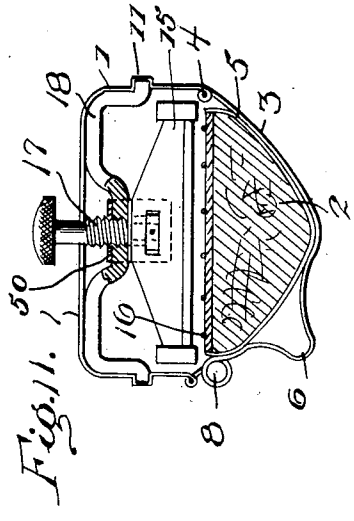


Fig. 11.

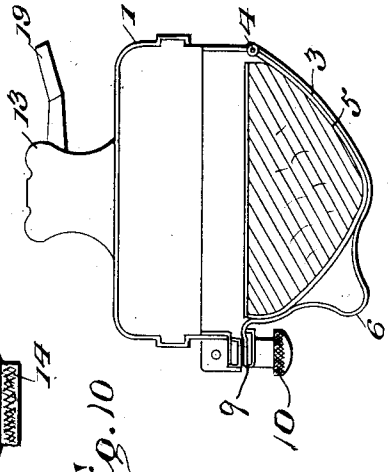


Fig. 10

Witnesses

W. A. Williams

S. W. Cook

Inventors

R. W. Weaver.

C. H. Weaver.

By Wm. C. R. W. Entire

Attorney

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES H. WEAVER AND ROLLIN W. WEAVER, OF SOUTH BETHLEHEM, PENNSYLVANIA.

MECHANICAL FINGERING DEVICE FOR STRINGED MUSICAL INSTRUMENTS.

1,094,038. Specification of Letters Patent. Patented Apr. 21, 1914.

Application filed January 9, 1911. Serial No. 601,640.

To all whom it may concern:

Be it known that we, CHARLES H. WEAVER and ROLLIN W. WEAVER, citizens of the United States, residing at South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Mechanical Fingering Devices for Stringed Musical Instruments; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to mechanical fingering devices for stringed musical instruments, such as the guitar, banjo, mandolin, cello, violin, etc., tuned in the usual manner.

The invention consists in general of levers or mechanical fingers operating directly on the strings of the musical instruments, and connected in groups so as to enable the mechanical fingering of the various musical chords by the operation of a single push button or key for each particular chord. The use of this device eliminates injury to the fingers from continual playing, as is frequently experienced, and enables one unskilled in technical music to easily and quickly acquire sufficient skill to play accompaniments on stringed instruments of this order.

With the above and other objects in view, this invention resides in the novel features of construction, formations, combinations and arrangements of parts to be hereinafter more fully described, claimed and illustrated in the accompanying drawing, in which—

Figure 1 is a top elevation of the device as applied to the neck and finger board of a guitar; Fig. 2 is a side elevation of the same; Fig. 3 is a transverse, vertical sectional view on the line 3—3 of Fig. 7; Fig. 4 is a partial longitudinal vertical sectional view, showing two inclined planes in normal position; Fig. 5 is the same as Fig. 4, showing operation of one mechanical finger by means of the inclined plane; Fig. 6 is the same as Fig. 4, showing operation of an inclined plane, without affecting the finger here shown in normal position; Fig. 7 is a longitudinal vertical sectional view of the device, showing the carriage or case in its normal position; Fig. 8 is a longitudinal vertical sectional view of the device, showing the case or sliding carriage in another position, illustrating the use of the capo tasto; Fig. 9 is a horizontal sectional view on the line 9—9 of Fig. 3, and Figs. 10 and 11 are end elevations, showing general outlines of the device.

Referring to the drawings by characters of reference, the numeral 1 represents a frame, which incases the finger board and upper part of the neck of a musical instrument 2, and has a lower section 3, hinged at one side on a rod 4. The hinged lower section is fitted to the neck of the instrument, and has pieces of felt or similar material 5 interposed between it and the neck to deaden any metallic sound or vibration. One side of the lower section is curved, as at 6, to provide a suitable grip for the hand, as well as giving the section a spring grip upon the neck of the instrument. Vertical posts or pillars 7 are provided at each end of the frame to give stiffness to the structure. The edge of the under section is rounded out as at 8, and at intervals flattened as at 9, to receive the locking nut 10, several of which are provided, and pivoted on the edge of the upper section of the frame. Two opposite slides 11 are placed in the sides of the upper section, on which slides the carriage or case 12, containing the operating mechanism, a hood or outer covering 13 being provided, which slides on the outer faces of the slides 11. A spring-retaining stop pin 14 is attached to the hood 13, and passes through holes punched in the slides 11 and carriage 12 at certain intervals, since it is desirable to slide the carriage down the neck of the instrument to obtain a variety of notes for which a new pitch is obtained by the use of the capo tasto, this being composed of a cross bar 15 made to bear against the strings 16 and having the end pieces 15′. A rod 17 has on its upper end a knurled head, being threaded at its central portion to pass through a cross member 18, and having its lower end pass through a hole in the top of the cross bar 15, a recess being formed in said cross bar, within which the end of the rod 17 extends, and is retained by a washer pinned to its lower end. The ends of the cross bar 18 fit into the slides 11 of the

frame, and thus allow of the sliding of the capo tasto to any desired position, a clip 50 being placed over the cross member 18 and extending down the sides of the cross bar 15, to retain said bar in alinement when adjusted vertically. The object of this capo tasto is to shorten the vibrating length of the open strings when the carriage is slid forward to obtain a variety of notes.

The mechanism within the slidably mounted case 12 is actuated by the downward pressure of any one of a series of buttons 19 formed on the ends of the bent levers 53. These bent levers 53 are pivoted at points 20 and provided with slots 22 through which pass pins 21 which are attached to and project from the lower part of pistons 31. In the case of a mandolin for example, the instrument is tuned in fifths, the strings from the lowest pair of unisons being respectively G, D, A and E. On such an instrument, this device is adapted to produce the standard major and minor chords of a given key according to the capo tasto. The pistons 31 are rigidly secured to the cross pieces 23, which are a part of or attached to adjacent cross pieces 24, on the lower side of which are formed inclined planes or surfaces 25. These inclined planes strike against the pins 26 attached to the longitudinal slidably mounted bars 27, imparting to said bars a longitudinal motion, the direction of which depends on which way the inclined planes face. To eliminate all possible friction, the pins 26 are provided with rollers or sleeves 28. Vertical cylinders 29 are fastened by suitable means, as rivets 30, to the top of the carriage 12, these cylinders being located over each cross bar 23 and containing a piston 31, which is attached to the cross piece 23, the spring 32 sustaining the piston at its upward point, thus normally holding the cross bar 23 in its upward position until pressed down by the action of the finger lever 19.

Fastened in the lower part of the carriage 12 are a series of longitudinal bars 33, held in position by rods 34 and stiffeners 35. On these bars are pivoted the mechanical fingers 36, by means of pins or rivets 37. The fingers are of substantially triangular shape, being pivoted at one apex, having a pin 38 at another apex, cushioned by a sleeve 39, made of cork or other suitable material; these sleeves bear against the strings when the fingers 36 are operated consequently are liable to considerable wear, and are so constructed that they may be easily renewed when necessary. The other points of the triangles are provided with a slot 40, in which are slid the pins 41 when it is desired to operate a particular finger, said pins being provided with friction-eliminating rollers 42. The pins 41 are fastened to the slidably mounted longitudinal bars 27 placed directly over the bars 33 and mounted on transverse rods 43, being suitably spaced by means of sleeves 44. These rods pass through slots in the bars 27 and roller bearings 45, are inserted to eliminate all possible friction. The bars are retained in their normal position by means of coil springs 46, fastened to the lower edges of these bars and the upper edges of the fixed bars 33. Flat leaf springs 47 are attached to the end of the casing 12, bearing against the sides of the slidably mounted bars 27, tending to hold the same from lateral displacement. These springs are also provided at their ends with a projecting portion 48, which fits in slight depressions in the bars 27 when in their normal position, thus tending to hold them in place until operated by the inclined planes. Lugs 49 are formed on the slidable bars 27, to retain the mechanical fingers 36 in an upright position when not in operation. Projections 51 are formed on the inside of the cylinders 29, and extend within the vertical slots 52 cut in the piston 31 to prevent rotation of same.

From the foregoing it will be seen that by suitable arrangements of the inclined planes 25, the pins 26 and 38 and the mechanical fingers 36, a variety of chords may be produced by the mechanical stopping or fingering of the various strings, through the operation of the finger buttons 19. By releasing the stop pin 14 and sliding the carriage or case 12 along the frame until the stop engages the next set of holes, then sliding the capo tasto upon the carriage and securing it down against the strings, their vibrating lengths will be lessened and a new pitch consequently obtained.

The device may be manufactured to embrace a few or all of the chords obtainable on such instruments, the one illustrated showing it applied to a guitar.

A particular feature of the device is the use of inclined planes or surfaces as the means for operating the mechanical finger-controlling bars, it being a particularly advantageous construction, and giving a smooth, easy action to the operating parts.

Having thus fully described our invention, what we claim as new and desire to secure by Letters Patent is:

1. A mechanical fingering device for stringed musical instruments, comprising a casing, means for clamping said casing upon the neck of an instrument, a carriage slidably mounted thereon, and mechanism located on the carriage for engagement with the strings of the instrument.

2. A mechanical fingering device for stringed instruments comprising a hinged casing encircling the neck and finger-board of an instrument, bolts for retaining said casing, a carriage slidably mounted there-

on, and mechanism located on the carriage for engagement with the strings of the instrument.

3. A mechanical fingering device for stringed musical instruments, a casing having an upper and lower section encircling the neck of an instrument, a longitudinal ridge or raised portion formed on the lower section to furnish a grip for the hand of the operator, as well as to provide a spring action in gripping the neck of the instrument, and a slidably mounted carriage upon the upper section of said casing, and mechanism provided in said carriage for engagement with the strings of the instrument.

4. A mechanical fingering device for stringed musical instruments comprising a casing encircling the neck of an instrument, longitudinal slides formed on said casing, a carriage engaging said slides and adapted to run thereon, and mechanism mounted in the carriage to engage the strings of the instrument.

5. A mechanical fingering device for stringed musical instruments comprising a casing encircling the neck of the instrument, a carriage slidably mounted upon said casing, a hood covering the carriage and part of said casing and slidable within the carriage, and mechanism mounted on said carriage for engaging the strings of the instrument.

6. A mechanical fingering device for stringed musical instruments comprising a casing mounted upon the neck of an instrument, a carriage slidably mounted on said casing, a hood covering said carriage, a spring-retained stop-pin attached to said hood for the purpose of fastening said hood and carriage to the frame, and mechanism mounted in said carriage for engaging the strings of the instruments.

7. A mechanical fingering device for stringed instruments consisting of a casing mounted upon the neck or finger-board of the instrument, a carriage slidably mounted upon the casing, mechanism mounted in said carriage for engaging the strings of the instruments, and a capo tasto mounted on a transverse bar, the ends of which are slidably mounted in said frame.

8. A mechanical fingering device for stringed musical instruments, comprising a frame encircling the neck and fingerboard of said instrument, a carriage slidably mounted on said frame, longitudinal bars rigidly fixed within said carriage, mechanical fingers pivoted to said longitudinal bars, and means for operating said mechanical fingers.

9. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted on said frame, longitudinal bars fixed within said carriage, mechanical fingers pivoted to said fixed bars, longitudinally slidable bars mounted upon and above said fixed bars, and pins arranged on said slidable bars engaging said mechanical fingers and means for sliding the bars.

10. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted on said frame, longitudinal bars fixed within said carriage, having pivoted thereto mechanical fingers for pressing the strings against the finger-board of the instrument, said fingers of substantially triangular form pivoted at one apex to the fixed longitudinal bars, and a pin surrounded by a sleeve of soft material fastened at another apex for bearing against the strings of the instrument.

11. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted thereon, longitudinally fixed bars carrying pivoted mechanical fingers fastened to said carriage, slidable bars mounted above said fixed bars, pins fastened thereto the said fingers each having slots formed therein, the said pins engaging said slots and moving said fingers and means for sliding the bars.

12. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted thereon, fixed longitudinal bars carrying pivoted mechanical fingers mounted on said carriage, longitudinally slidable bars mounted above said fixed bars, transverse rods fixed in said carriage passing through slots in the slidable bars, and sleeves mounted on said rods between said slidable bars substantially as described.

13. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted on said frame, longitudinal bars fixed within said carriage, mechanical fingers pivoted to said fixed bars, slidable bars mounted above the fixed bars and lugs projecting from said slidable bars for engaging and retaining the mechanical fingers in an upright position when not in operation and means for sliding the bars.

14. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and fingerboard of the instrument, a carriage slidably mounted on said frame, longitudinal bars fixed within said carriage, mechanical fingers pivoted to said bars, longitudinally slidable bars mounted above the fixed bars having lugs engaging the mechanical fingers, coil springs

attached to the under side of the slidable bars and the upper side of the fixed bars for the purpose of retaining said slidable bars in a normal position and means for sliding the bars.

15. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted on the frame, longitudinal bars fixed within said carriage, mechanical fingers pivoted to said bars, slidable bars mounted above the fixed bars and engaging the said mechanical fingers, pins fixed on the slidable bars, and transverse bars having downwardly extending inclined planes or surfaces, for engaging said pins and means for sliding the bars.

16. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of an instrument, a carriage mounted thereon, longitudinal bars fixed within said carriage, mechanical fingers pivoted to said bars, longitudinal slidable bars mounted above the fixed bars engaging said mechanical fingers, and a series of vertical sliding transverse bars having inclined surfaces or planes attached thereto engaging said slidably mounted longitudinal bars, and means for sliding said transverse bars.

17. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and finger-board of the instrument, a carriage slidably mounted thereon, longitudinal bars fixed in said carriage, mechanical fingers pivoted to said bars, slidably mounted bars above the fixed bars, pins variously arranged on said slidable bars for engaging said mechanical fingers, a plurality of vertical slidable transverse bars mounted near the top of the said carriage, downwardly extending inclined planes or surfaces for engaging with said pins on the slidable bars, and pivoted levers secured to the transverse bars for the purpose of sliding same in a vertical direction.

18. A mechanical fingering device for stringed instruments comprising a frame surrounding the neck and fingerboard of the instrument, a carriage slidably mounted on said frame, longitudinal bars fixed within said carriage, mechanical fingers pivoted to said bars, slidably mounted bars above the fixed bars, a plurality of vertically slidable transverse bars having downwardly extending inclined planes for engaging said slidable bars, levers for sliding the transverse bars, pistons attached to the upper sides of the transverse bars, cylinders secured to the top of the carriage and surrounding said pistons, springs mounted in said cylinders for holding said pistons in raised position whereby the said transverse bars are normally held out of engagement with the slidable longitudinal bars.

19. A mechanical fingering device for stringed musical instruments comprising a frame embracing the neck and fingerboard of the instrument, longitudinal bars fixed within said frame, mechanical fingers pivoted to said bars, slidably mounted bars above the fixed bars, a plurality of vertically slidable transverse bars having downwardly extending inclined planes or surfaces for engaging said slidable bars, levers for engaging the transverse bars, spring-pressed pistons attached to the upper sides of the transverse bars, and cylinders fastened to the top of the frame to receive said pistons, whereby the said transverse bars are normally held out of engagement with the slidable longitudinal bars.

20. A mechanical fingering device for stringed musical instruments comprising a frame, a mechanism-containing carriage slidably mounted upon said frame, said frame encircling the neck and finger board of the instrument, a capo tasto comprising a cross member, the ends of which are slidably mounted in said frame, an adjusting screw mounted centrally of said cross member, a cross bar adapted for engagement with the strings of the instrument transversely thereof mounted within the frame and operatively connected with the adjusting screw, said cross bar being arranged in parallel alinement with the cross member and means for holding said cross bar in parallel alinement with the cross member mounted upon said cross member and engaging the sides of the cross bar.

In testimony whereof we affix our signatures in presence of two witnesses.

CHARLES H. WEAVER.
ROLLIN W. WEAVER.

Witnesses:
OTTO D. HAGARD,
HARVEY JOHNSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."