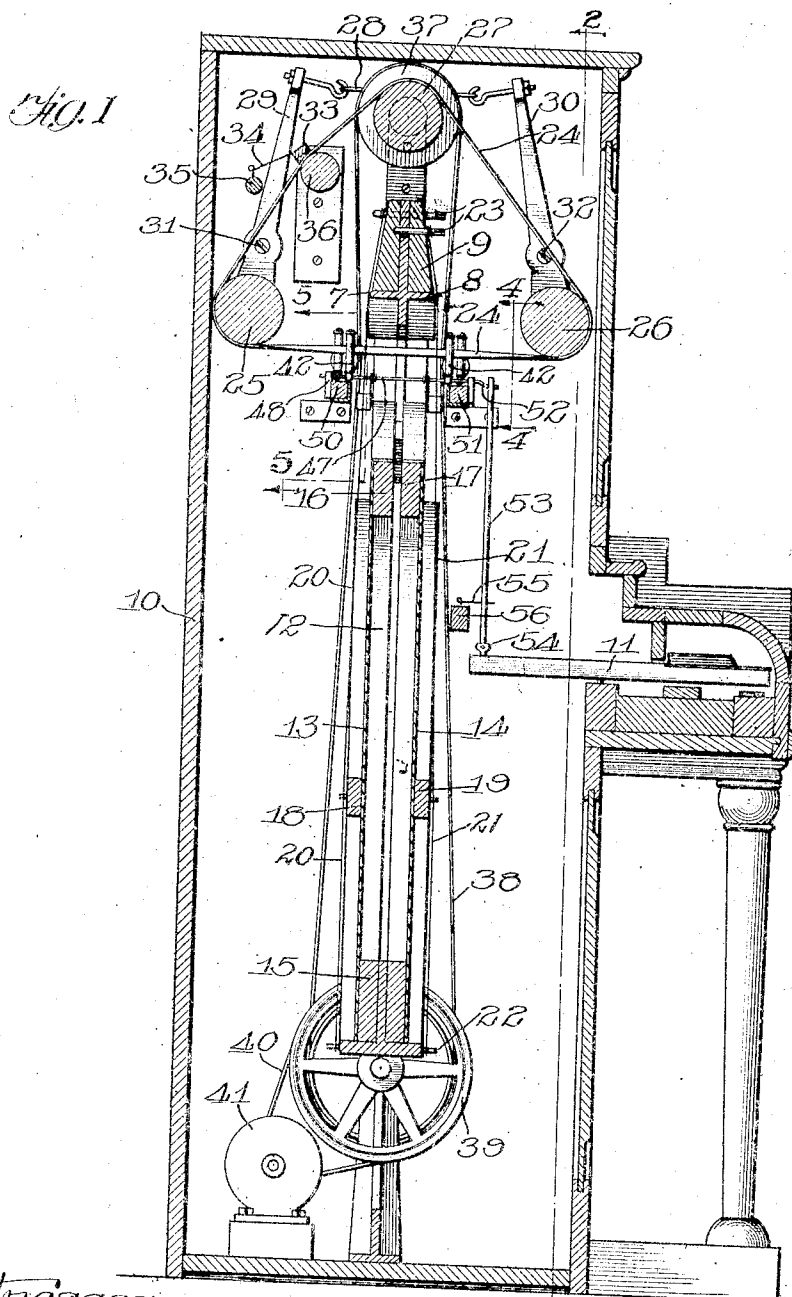


1,036,600.

W. E. FOX.
PIANO VIOLIN.
APPLICATION FILED OCT. 18, 1909.

Patented Aug. 27, 1912.
4 SHEETS—SHEET 1.



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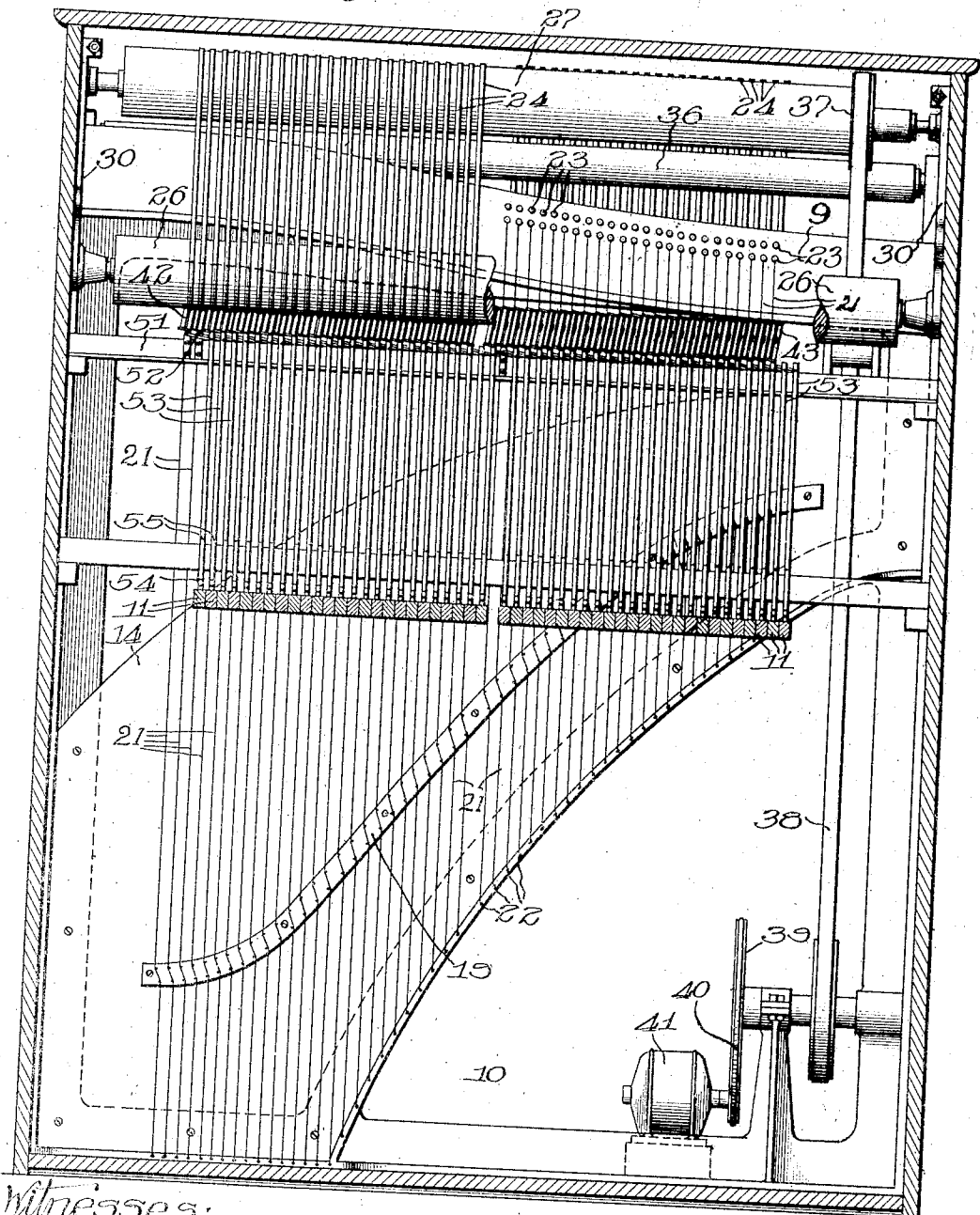
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4 SHEETS—SHEET 2.

Fig. 2.



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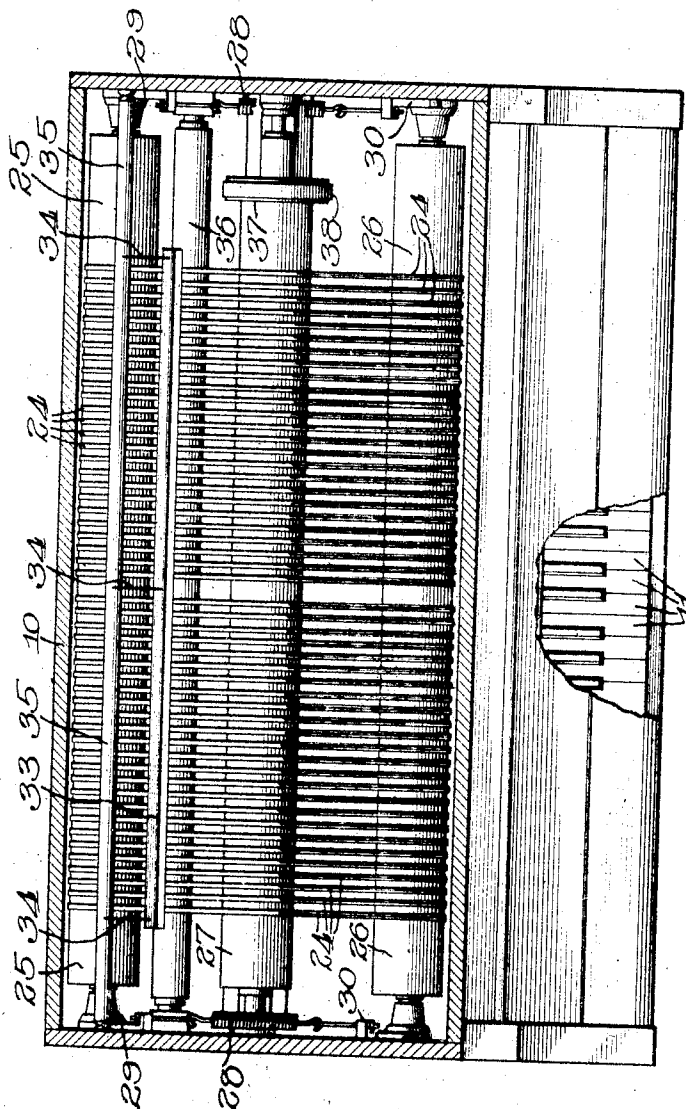
PIANO VIOLIN.

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1,036,600.

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4 SHEETS—SHEET 3.



243.

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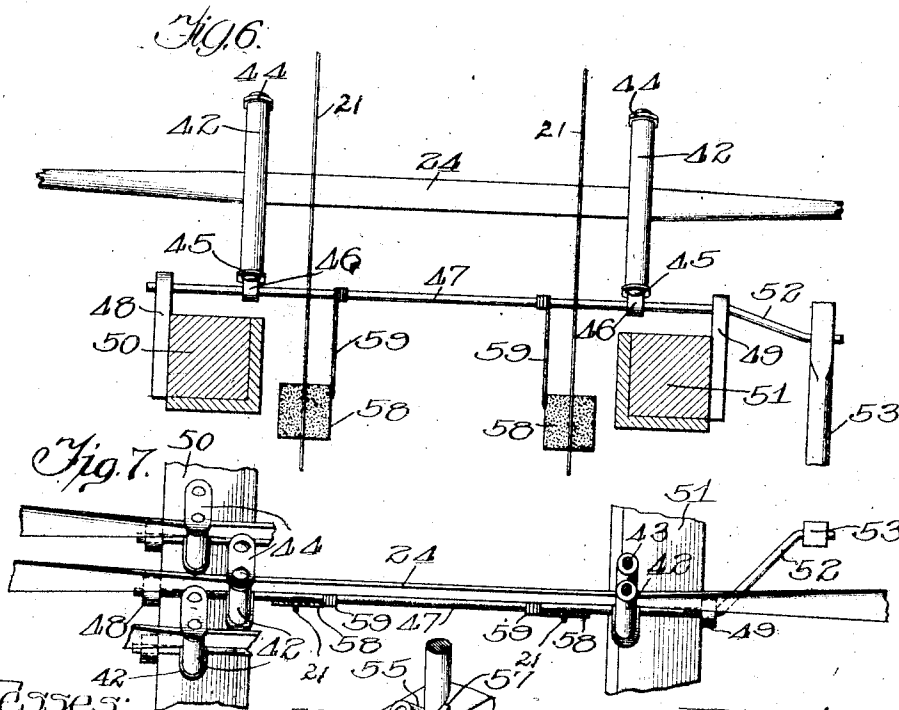
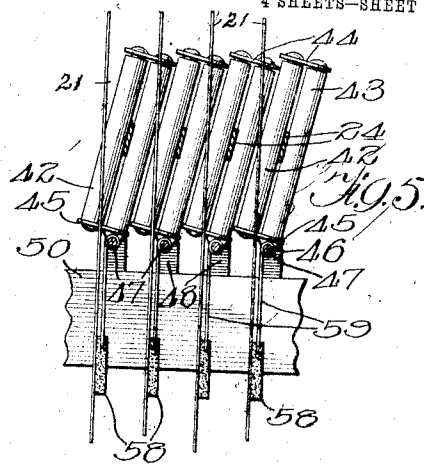
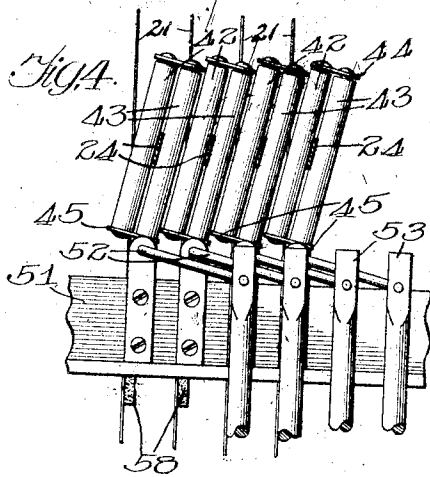
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1,036,600.

Patented Aug. 27, 1912.

4 SHEETS-SHEET 4.



Witnesses:

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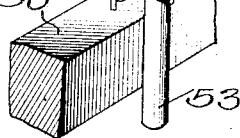


Fig. 8. Inventor:
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UNITED STATES PATENT OFFICE.

WALTER E. FOX, OF CHICAGO, ILLINOIS.

PIANO-VIOLIN.

1,036,600.

Specification of Letters Patent. Patented Aug. 27, 1912.

Application filed October 18, 1909. Serial No. 523,116.

To all whom it may concern:

Be it known that I, WALTER E. FOX, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Piano-Violins, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to musical instruments of the piano violin type shown and described in Letters Patent of the United States, No. 789,272, granted to me May 9, 1905, in which a plurality of vibratory strings are operated upon by an endless cord or cords after the manner of a fiddle bow, said cord being actuated by the operation of keys, such as the keys of a piano.

The object of my present invention is to provide certain improvements in instruments of the above-mentioned type, as will be hereinafter pointed out.

What I regard as new will be set forth in the claims.

In the accompanying drawings,—Figure 1 is a vertical cross-section; Fig. 2 is a longitudinal vertical section on line 2—2 of Fig. 1; Fig. 3 is a plan view, the upper portion of the case being in section; Fig. 4 is an enlarged detail, being a partial section on line 4—4 of Fig. 1; Fig. 5 is a similar view, being a section on line 5—5 of Fig. 1, showing the opposite side of the cord-actuating rollers; Fig. 6 is a detail, being a view of one set of the cord-actuating rollers and connected parts taken at right angles to the views shown in Figs. 4 and 5; Fig. 7 is a plan view of the parts shown in Fig. 6; and Fig. 8 is a perspective view of a portion of one of the actuating rods.

The instrument of my said patent, in general, comprises a sounding-board, at the opposite sides of which are stretched sets of vibratory strings, the opposite strings of each set being alike in pitch, and provision is made for vibrating each pair of like strings in unison,—such actuating means comprising an endless cord extending transversely of the sounding-board between adjacent pairs of strings and being movable

laterally into engagement with the appropriate pair of strings by suitable mechanism controlled by the operation of a certain key of the keyboard. The endless cord or cords are caused to travel continuously, when the instrument is in operation, by means of pedals. The instrument which forms the subject-matter of this application embodies the same generic features, but is an improvement thereon in several respects, which will be hereinafter pointed out.

Referring now to the drawings for a detailed description of the instrument as therein shown,—10 indicates a case, which is of suitable shape to inclose the various operating parts of the instrument, being preferably of the shape of a piano case, as shown in Fig. 1, and having a regular piano keyboard.

11 indicates one of the keys of the keyboard, which is pivotally supported in the usual way.

12 indicates a frame for supporting the sets of vibratory strings, said frame being of the usual triangular or harp shape, as shown in Fig. 2. As shown in Fig. 1, the upper portion of the frame 12 is substantially cross-shaped in cross-section, having laterally-projecting flanges 7—8.

13—14 indicate sounding-boards which together constitute a double sounding-board, the lower margins of said sounding-boards 13—14 being secured to a supporting-bar 15 which forms the lower member of the frame 12, while the upper margins of said sounding-boards are secured to bars 16—17, respectively, secured intermediately to the frame and extending from one side thereof to the other. The sounding-boards 13—14 may be of any suitable material.

18—19 indicate bridges mounted upon the sounding-boards 13—14 and extending longitudinally thereof, as shown in Figs. 1 and 2.

20—21 indicate the two sets of strings, the ends of which are secured in the usual way to pins 22—23 in the member 15 and the wrest-plank 9 of the frame 12, as best shown in Fig. 1. The upper wrest-pins 23 are squared so that they may be rotated

for tuning the strings in the usual way, and, as best shown in Fig. 1, the wrest-pins for the sets of strings at both sides of the sounding-board are arranged to be adjusted from the same side of the instrument, the set of wrest-pins for the strings 20 being extended through the frame to receive the upper ends of such strings, as shown. The sets of strings 20—21 bear upon the bridges 18—19, and at their upper ends extend over the flanges 7—8 of the frame 12, as shown in Fig. 1, forming supplemental bridges for the upper ends of the strings. As has been explained, the two sets of strings are duplicates of each other, and the opposite strings are correspondingly tuned so that each tone is represented by a pair of identical strings. Each pair of strings is vibrated in unison by the actuation of one of the keys 11 of the instrument by mechanism which will now be described.

24 indicates a series of endless belts or bands of cowhide or other suitable material. One of said bands is provided for each pair of strings, and each of said bands is mounted upon three rollers 25—26—27, which are triangularly arranged and extend parallel with the frame of the instrument, as shown in Figs. 1 and 2,—the roller 27 being above the frame and the rollers 25—26 at opposite sides thereof, as best shown in Fig. 1. Each of the bands 24 extends transversely of the string frame, passing between adjacent strings thereof, and is normally out of contact with the strings. The several bands may be caused to engage a pair of like strings by moving them laterally into contact therewith. The several bands are kept taut by means of springs 28 acting through levers 29—30, by which the rollers 25—26 are respectively carried, said levers being pivoted at 31—32 to the ends of the case, as shown in Fig. 3. The springs 28 act to draw together the upper ends of the levers 29—30 so that the rollers 25—26 are yieldingly held apart, thereby keeping the several bands 24 under tension. If desired, rosin may be applied to the several bands by means of a rosin device comprising a rosin-holder 33, which is pressed against the several bands by a spring 34 carried by a rod 35. At the point where the rosin is applied the bands are deflected by a rod 36, as best shown in Figs. 1 and 3,—said rod serving as a support for the bands where the rosin is applied thereto.

37 indicates a pulley mounted at one end of the roller 27 and driven by a belt 38 from a pulley 39 which itself is driven through a belt 40 from a motor 41. The motor may be controlled in any suitable way so as to drive the pulley 37 and through it the bands 24 at any desired speed.

It will be apparent from the foregoing de-

scription that the several bands may be driven continuously in the same direction, and that when so driven they travel between the several strings of the two sets mounted at opposite sides of the sounding-board, and that, unless deflected laterally, said bands do not cause the several strings to vibrate.

For the purpose of deflecting the bands, each is provided at opposite sides of the sounding-board with a pair of deflecting rollers 42—43. The rollers of each pair are parallel with each other and are connected together at the top by a plate 44 and at the bottom by a plate 45, as shown in Figs. 4 and 5, the plate 45 being also provided with a sleeve 46, which is mounted upon a rock-shaft 47 journaled in suitable supports 48—49, which are connected to longitudinally-extending bars 50—51 provided at opposite sides of the frame, as best shown in Figs. 1 and 6. The rock-shafts 47 are provided at one end with a crank-arm 52, which is engaged by a vertical rod 53 supported by the inner end of the key 11, as shown in Figs. 1 and 6, so that by depressing any given key the corresponding rod 53 will be raised, thereby rocking the shaft 47 and consequently throwing the rollers 42—43 carried by it over toward the plane of the pair of strings the operation of which is controlled by such rollers. The several playing keys 11 are provided with adjusting screws 54 for adjusting the position of the rods 53 in the usual way, and said rods are provided with springs 55 carried by a supporting-bar 56 for assisting in depressing said rods when released. The springs 55 preferably engage inclined slots 57 in the rods 53, so that the rods may be readily detached when desired.

As shown in Figs. 1, 4 and 7, each of the bands 24 passes between the two pairs of rollers 42—43 carried by one of the rock-shafts 47, being twisted at right angles in doing so, as shown in the drawings. Thus the broad surfaces of the several bands are brought into parallelism with the rollers 42—43, and, when moved into contact with the several strings, present a broad surface to them and thereby secure a better engagement with them, the effect being substantially the same as that of the application of a bow to a violin string. The several rollers 42—43 are so mounted that normally they are slightly inclined to the vertical, but when rocked to carry their respective bands over into engagement with the strings they assume a substantially vertical position, being then parallel with the strings and presenting the operating surfaces of the bands squarely to such strings. This will clearly appear from an inspection of Figs. 4 and 5. To prevent the rollers carried by adjacent rock-shafts from interfering with

each other, they are staggered, as shown in Fig. 7.

58 indicates dampers carried by arms 59 depending from the rock-shafts 47 in position to hold the dampers respectively in contact with the several strings when the rollers 42—43 are out of operative position. When any shaft 47 is rocked to operate any given pair of strings, the rocking of the shaft automatically moves the dampers carried by it out of engagement with the strings to be operated.

In operating the instrument, the performer manipulates the several keys just as in playing a piano, the pairs of strings controlled by any given key being caused to vibrate when such key is depressed, by the engagement therewith of the corresponding endless band, which is moved into engagement therewith by the two pairs of band rollers between which it moves. Upon being released, the band immediately moves out of engagement with the strings and is restored to its former position by the tension on the rollers 25—26 and by the weight of the rod 53 acting through the rock-shaft on which the rollers 42—43 are mounted. By employing flat bands instead of round cord, as in the construction of my patent hereinbefore referred to, and presenting the broad surfaces of said bands to the strings, a more positive engagement is obtained and the vibratory effect is stronger, a much better tone being secured.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. A musical instrument, comprising a vibratory string, an endless band moving across said string, means for twisting said band to present one of its broad surfaces to the string, a key, and means operated by the key for deflecting said band to cause it to engage said string.

2. A musical instrument, comprising a vibratory string, an endless band moving across said string, two pairs of rollers between which said band moves, said rollers being movable toward and from the string, a key, and means operated by the key for moving said rollers to carry the band into and out of engagement with said string.

3. A musical instrument, comprising a suitable frame, a vibratory string strung thereon, an endless band moving across said string, means at opposite sides of said string for twisting said band to cause it to present a broad surface to the string, a key, and means actuated by the key for moving said band to cause it to engage said string.

4. A musical instrument, comprising a frame, a vibratory string strung thereon, an endless band traveling across said string, a rock-shaft, a pair of rollers carried by said rock-shaft at each side of said string, said

band moving between said pairs of rollers, a key, and means actuated by said key for rocking said shaft to move said band into engagement with the string.

5. A musical instrument, comprising a frame, a vibratory string strung thereon, an endless band traveling across said string, a rock-shaft, a pair of rollers carried by said rock-shaft at each side of said string, said band moving between said pairs of rollers and being twisted thereby so as to present a broad surface to the string operated by it, a key, and means actuated by said key for rocking said shaft to move said band into engagement with the string.

6. A musical instrument, comprising a frame, duplicate sets of vibratory strings carried thereby, corresponding strings being opposite each other, endless bands moving between the adjacent strings of said sets and adapted to be deflected to engage the several pairs of strings, and means for twisting the several bands to cause them to present broad surfaces to their respective strings.

7. A musical instrument, comprising a frame duplicate sets of vibratory strings carried thereby, corresponding strings being opposite each other, endless bands moving between the adjacent strings of said sets and adapted to be deflected to engage the several pairs of strings, rock-shafts extending between adjacent strings, a pair of rollers carried by each of said rock-shafts at each side of said frame, each of said bands moving between the pairs of rollers carried by their respective rock-shafts, a keyboard, and means actuated by the several keys for rocking the several rock-shafts.

8. A musical instrument, comprising a frame, duplicate sets of vibratory strings carried thereby, corresponding strings being opposite each other, endless bands moving between the adjacent strings of said sets and adapted to be deflected to engage the several pairs of strings, rock-shafts extending between adjacent strings, a pair of rollers carried by each of said rock-shafts at each side of said frame, each of said bands moving between the pairs of rollers carried by their respective rock-shafts and being twisted thereby so as to present a broad surface to the string to be operated by it, a keyboard, and means actuated by the several keys for rocking the several rock-shafts.

9. A musical instrument, comprising a series of vibratory strings, endless means adapted to move between the adjacent strings of the several sets for vibrating the same, and pairs of rollers for moving said vibrating means into engagement with the strings, said pairs of rollers being staggered.

10. A musical instrument, comprising a series of vibratory strings, endless means adapted to move between the adjacent

strings of the several sets for vibrating the same, rock-shafts extending transversely of said frame between the adjacent strings of said sets, and pairs of rollers carried by said rock-shafts for actuating said vibrating means, the rollers carried by adjacent rock-

shafts being in staggered relation to each other.

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