O. KURTZ.

PIANO VIOLIN.

APPLICATION FILED MAY 27, 1907.

899,740.

Patented Sept. 29, 1908.

4 SHEETS—SHEET 1.

Fig. 13.

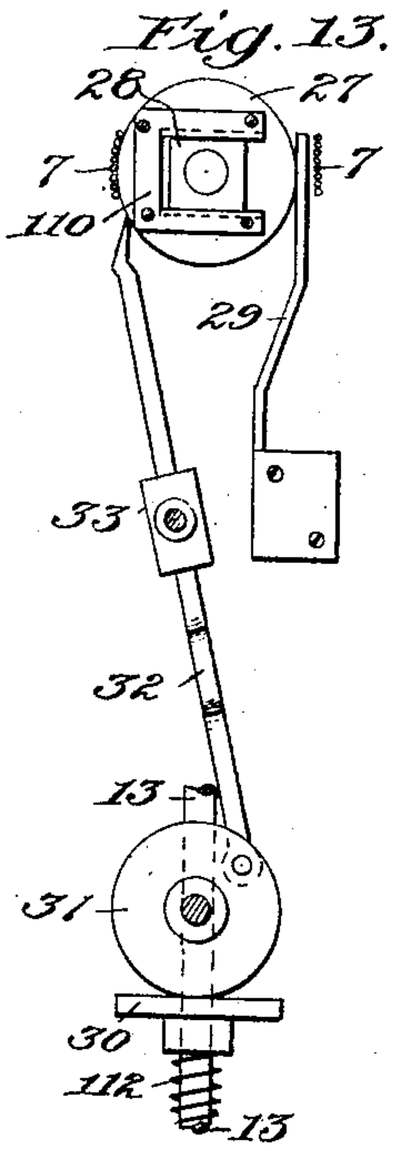
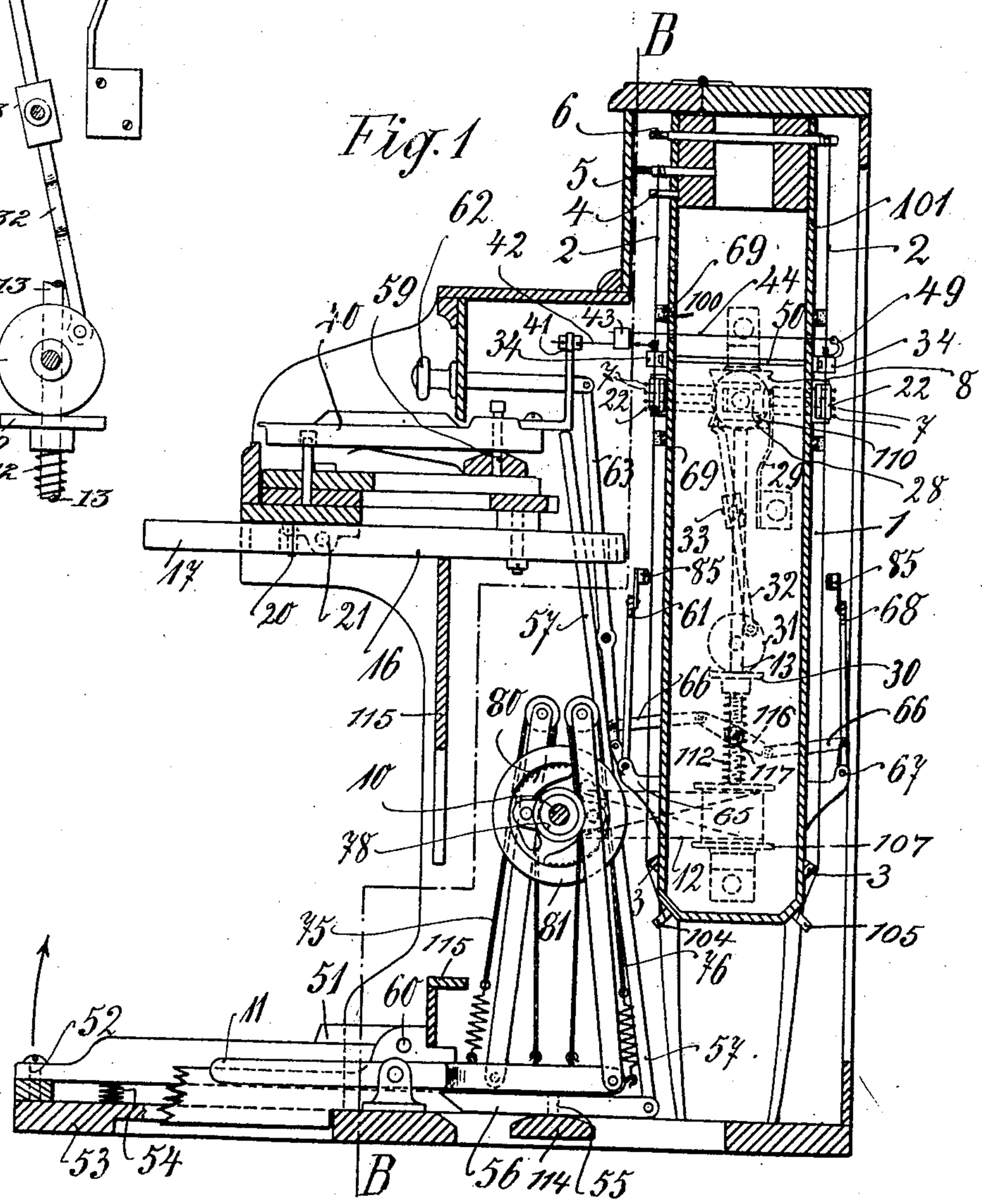


Fig. 1



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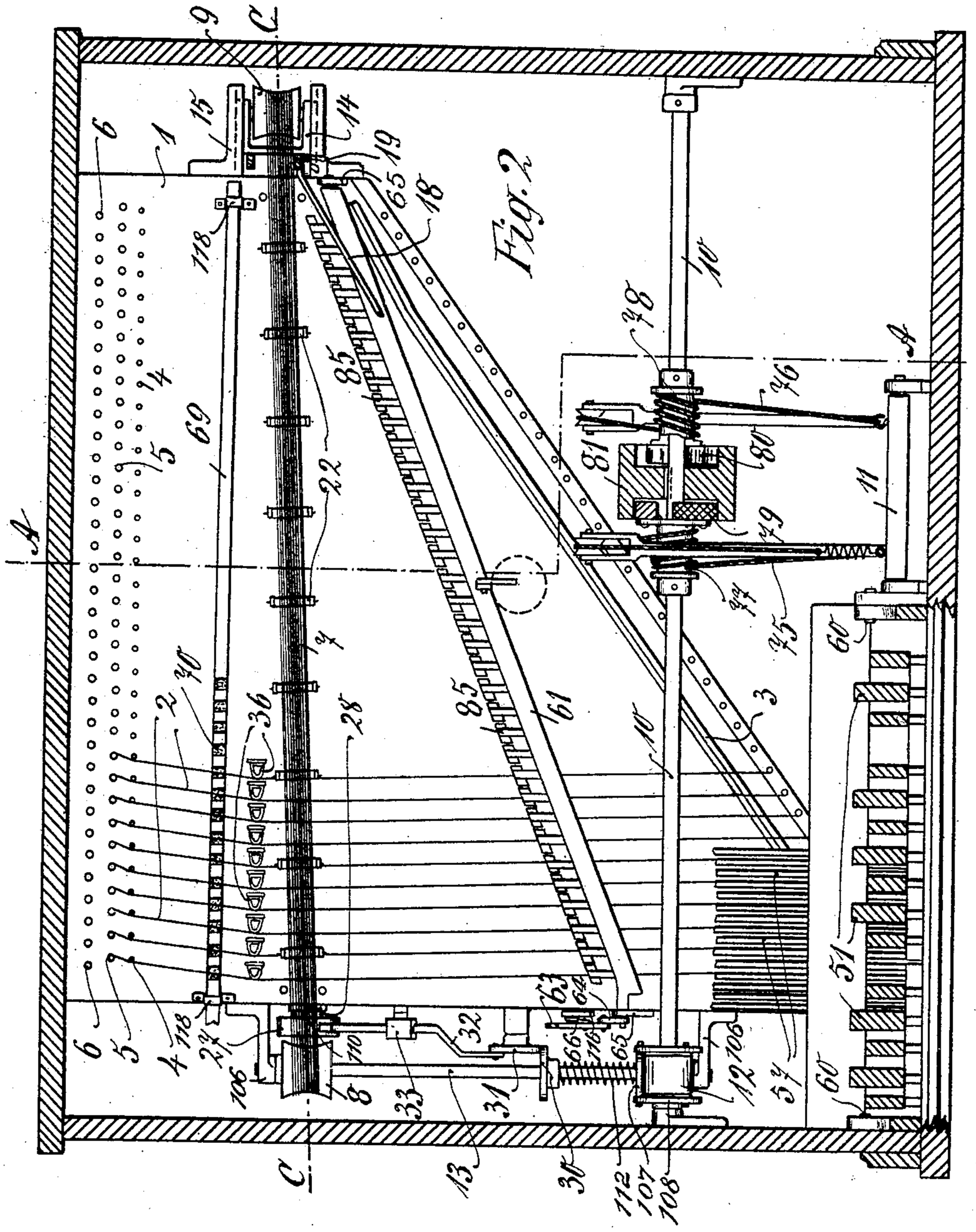
4 SHEETS—SHEET 2.

Fig. 2



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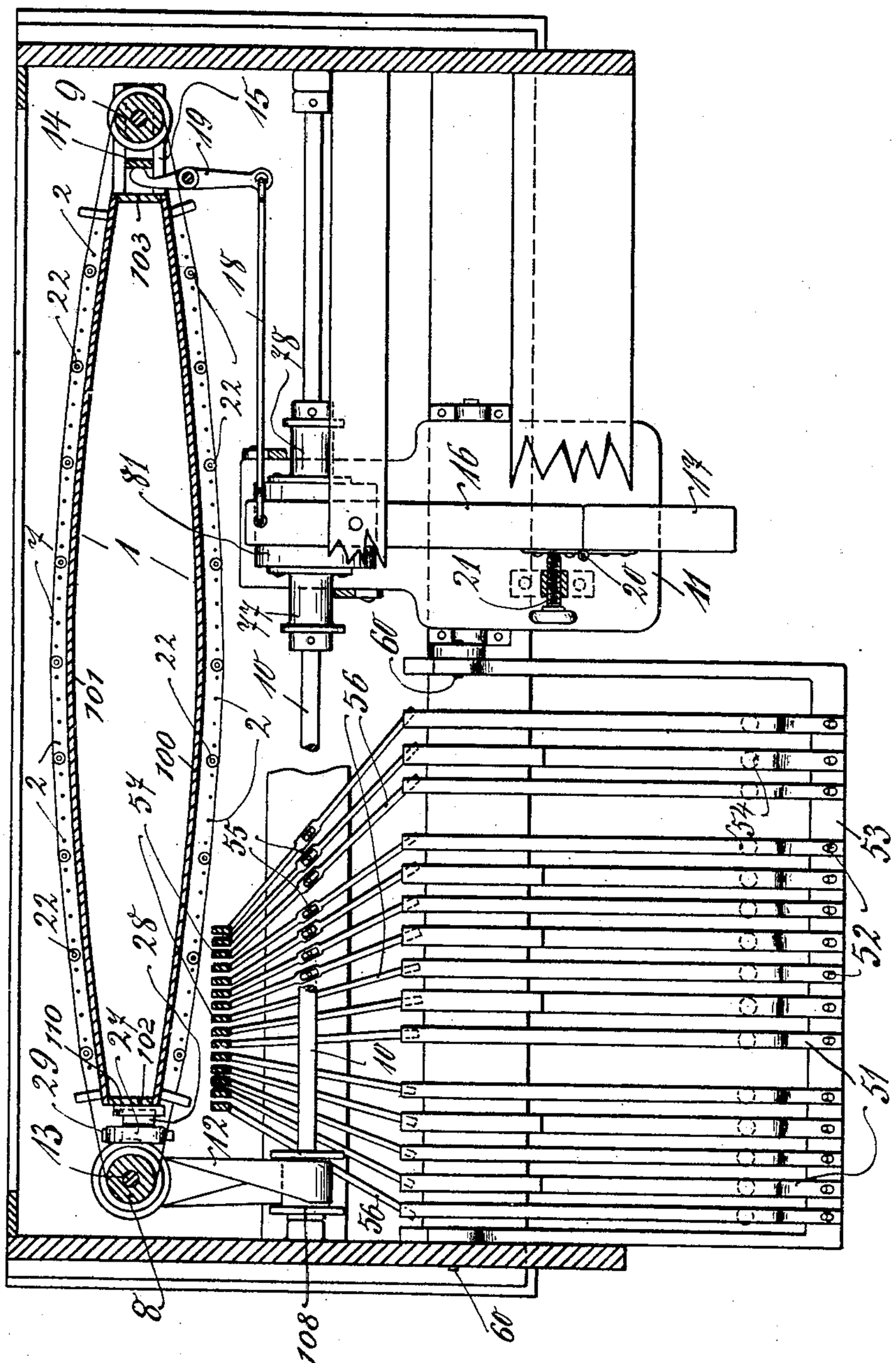
4 SHEETS—SHEET 3.

Fig. 3



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4 SHEETS—SHEET 4.

Fig. 4

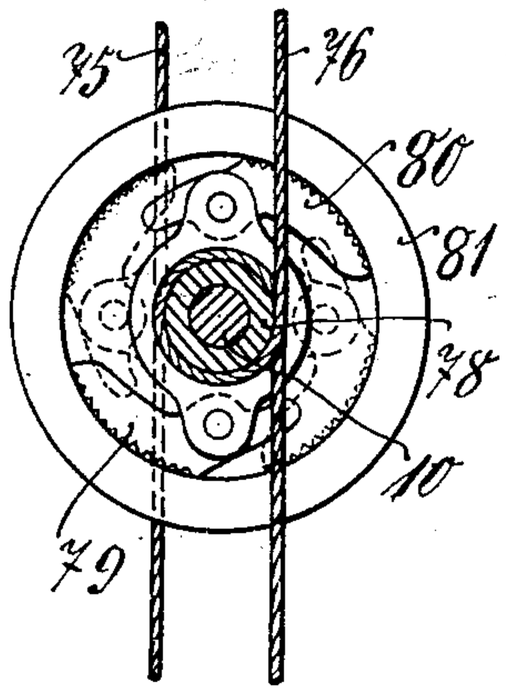

Fig. 5

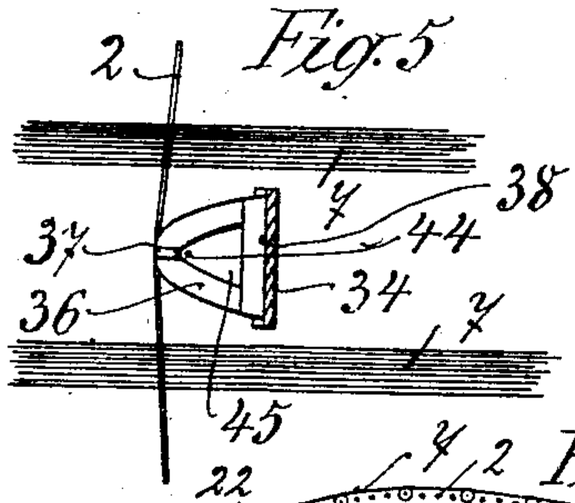

Fig. 6

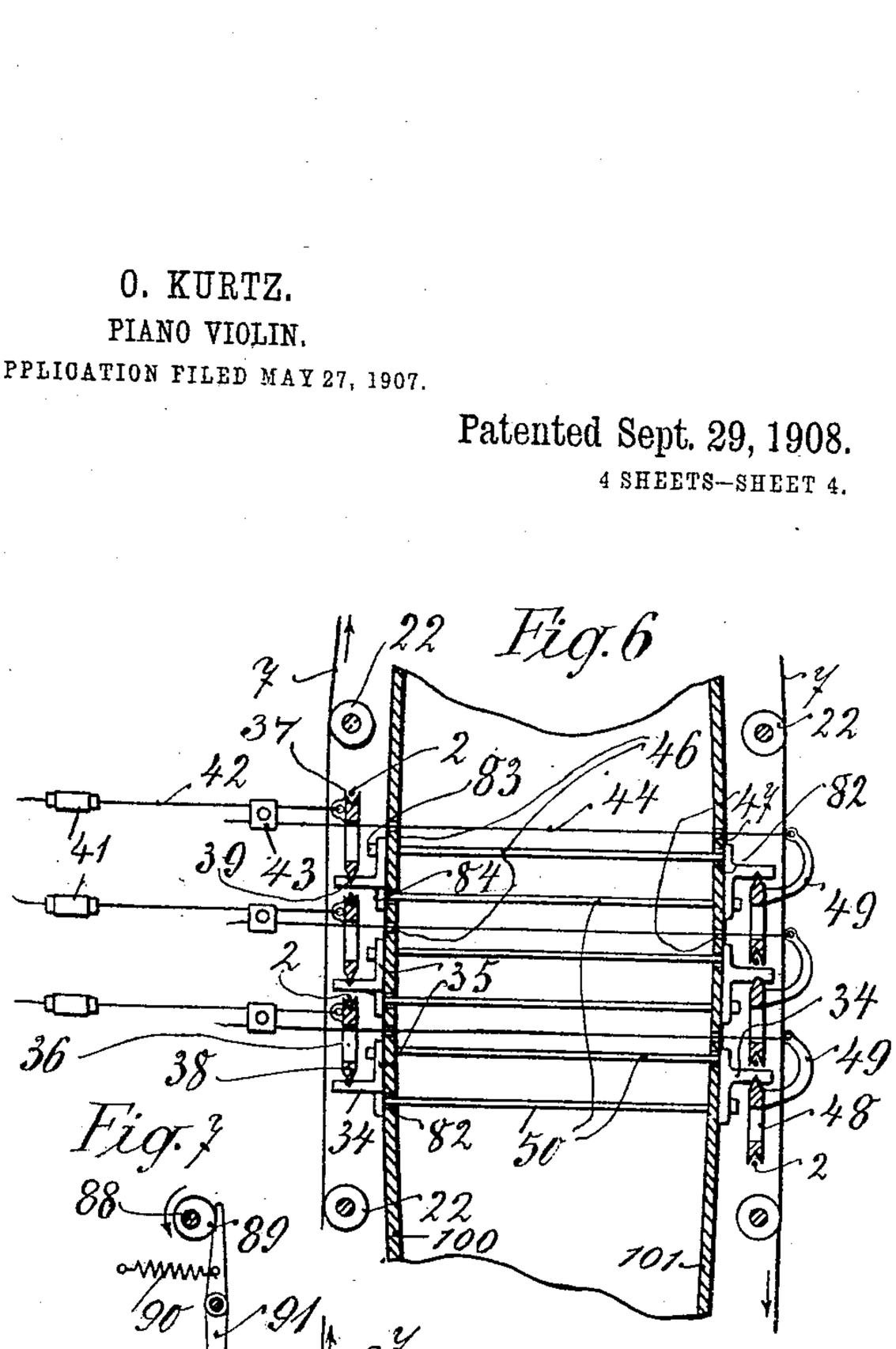

Fig. 7

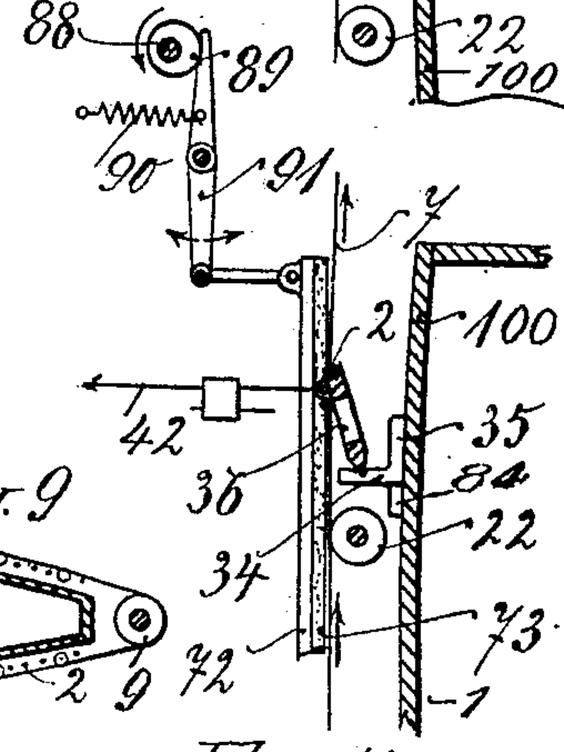

Fig. 8

Fig. 9

Fig. 10

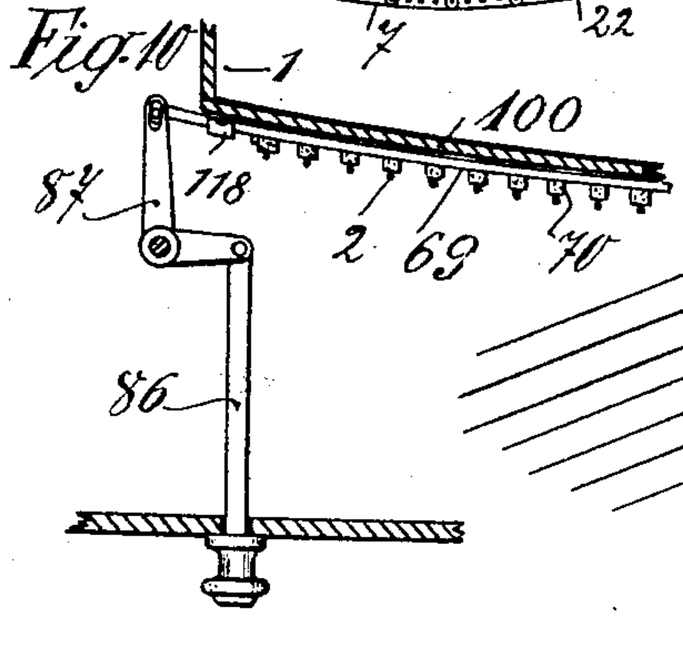

Fig. 11

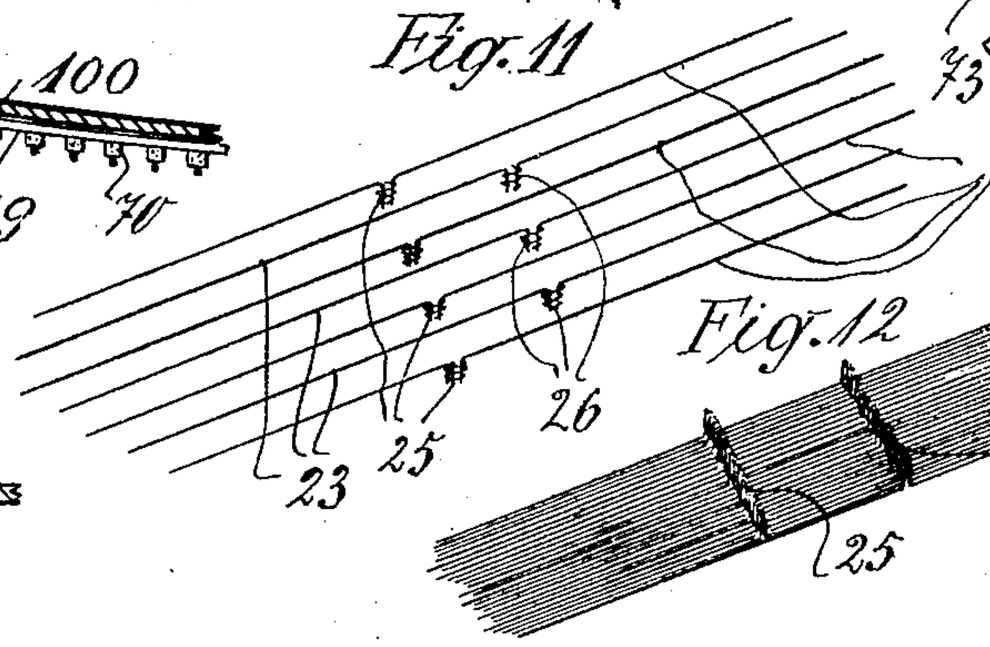

Fig. 12

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UNITED STATES PATENT OFFICE.

OSCAR KURTZ, OF VIENNA, AUSTRIA-HUNGARY.

PIANO-VIOLIN.

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Application filed May 27, 1907. Serial No 375,968.

To all whom it may concern:

Be it known that I, OSCAR KURTZ, piano-tuner, a subject of the Emperor of Austria-Hungary, residing at Vienna, in the Empire of Austria-Hungary, VII., Sigmundsgasse 13, have invented certain new and useful Improvements in Piano-Violins, of which the following is a specification.

My present invention relates to musical instruments; and has for its object, an instrument which substantially has the form of a pianoforte or piano but which, however, differs from such instrument in that the strings are not struck, but bowed, when the keys are operated. This new instrument, is therefore played substantially like a piano, or the same may be operated, in any other suitable manner, whether mechanically, electrically or pneumatically, the keys either being retained or abolished.

An important object of the invention, is an instrument adapted to be operated by hand, with which as far as possible, all the niceties of sound, which can be had with the violin, for example, can be obtained, when it is played. To accomplish this it is necessary that the strings be bowed stronger or weaker and at times the bow subjected to an increase in tension to produce piano and forte and crescendo and diminuendo effects. Moreover by vibrating the strings a tremolo-effect and lastly flageolet tones or the like can be produced by damping quickly and releasing and limiting the movements of the strings. At the same time harmonic effects are produced by vibrating only portions of the strings.

An important feature of the instrument, according to the present invention, consists in an endless band arranged transversely of and common to all the strings, which replaces the bow of the violin and which is constantly moved longitudinally in one and the same direction during playing, each string which is to be sounded being moved against this band; for this purpose the bridge which determines the effective length of the strings possesses a part, which is movable in such a manner as that when the same is moved, the string can approach the band. The new instrument is also provided with a number of devices which serve to fulfil the above-mentioned requirements. There are provided the following, a tension device for the band to play louder or softer; a device for rubbing rosin into the band; an oscillating bridge; a damping device for the strings, a device for producing a tremolo effect and a device for producing flageolet tones or the like as well as harmonic effects.

The nature and scope of my present invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, in which

Figure 1 is a vertical cross-sectional view on the line A—A of Fig. 2. Fig. 2 is a longitudinal sectional view, on the line B—B of Fig. 1. Fig. 3 is a longitudinal sectional view on the line C—C of Fig. 2; and Figs. 4 to 13, are detail views, of various parts of the instrument hereinafter more fully explained.

The instrument represented in the drawing, has the form of a piano, and is therefore played as such, while a treadle, similar to that used in a harmonium is used for driving the band.

Referring to the drawing 1, represents a resonance body or sounding-box, formed of curved sides 100 and 101, and straight sides 102 and 103, and is substantially of rectangular outline, in cross-section, in a vertical plane. To each of the sides 100 and 101, of the box 1, by means of tuning pins 5, and pegs 104 and tuning pins 6, and pegs 105, respectively, is secured a set of strings 2, stretched over bridges 3 and 4, in a manner as shown in Figs. 1 and 2. In order to permit of the turning of tuning pins 6, of the rear set of strings 2, from the front side of the sounding-box 1, the same pass through the box 1 and extend beyond the front side 100 thereof, and at their ends like the tuning pins 5, are so shaped, as to permit of turning by a key, not shown. Transversely around the sounding-box 1, and over the strings 2, on each side of the same passes an endless band 7, which is held in operative position, by a driving-pulley 8, and a tension-pulley 9. The driving-pulley 8, is supported by a shaft 13, carried by brackets 106, secured to the side 102, of the sounding-box 1, which shaft is rotated preferably, by a pulley 107 secured thereto, and a quarter turn belt 12, passing over the pulley 107, and a pulley 108, carried by a shaft 10, which is driven, by means hereinafter more fully described. The pulley 8, so rotated in conjunction with the tension-pulley 9, moves the band 7, over the strings 2, while the tension-pulley 9, in order to increase or decrease the tension of the band 7, is supported by a slide 14, which is

movably mounted in brackets 15, secured to the side 103, of the sounding box 1, and is held in proper position in the brackets 15, by a lever 19, which by means of a rod 18, is connected with a lever 16, provided with an extension 17, movably secured thereto, in the point 20, and which extension projects within reach of the knee of the performer and by its pivotal connection may be swung inwards, towards the instrument, when not in use. A threaded stop 21, by bearing against the lever 16, and by the intervention of the rod 18, and lever 19, controls the normal position, of the slide 14, and thus of the tension-pulley 18, in the bracket 15, and also permits of playing piano, when turned so as to decrease the tension on the band, while as hereinbefore described the lever 16, by being moved from left to right, in Fig. 3, increases the tension and thus produces a forte effect. The band 7, between the pulleys 8 and 9, is guided by rollers 22, suitably secured to the respective sides 100 and 101, of the sounding-box 1, and is held by the same a certain distance away from the set of strings 2, to normally prevent a sounding of the same, by the band.

In order to permit of the substantially uniform sounding of all the strings 2, by the band 7, irrespective, of their gradually decreasing length, the pressure exerted by the band 7, on the strings 2, must be proportional to the differing lengths of strings, as shown in Fig. 9. This difference in pressure is obtained by gradually decreasing the radius of curvature of the sides 100 and 101, of the sounding-box 1, in the direction of increase in length of the strings, which in the present instance, is from right to left in Fig. 2, so that the bass strings arranged at the left hand side of the sounding-box 1 in Fig. 2, are sounded substantially with the same force as the short strings at the right hand side thereof. This uniform sounding of the strings is also rendered possible by arranging the band at an angle to the horizontal so as to hold the band 7, a proper distance away from the bridges 3, of the short strings, as shown in Fig. 2.

The band is composed of horse-hair and being of considerable length, each strand thereof, is formed of sections 23 and 24, of such hair, which are joined to each other in such a manner as that the joint of one strand is a certain distance away from the joint of the adjacent strand and thus when the joints of the strands pass over a string the same do not cause an interruption in the note, nor a twitching of the string. As shown in Figs. 11 and 12, for this purpose, the sections 23 and 24, of each strand are bent outwards away from the strings 2 and are connected with each other by strings to form joints 25 and 26. The joints formed by the abutting ends of the sections of the even numbered strands and those of the odd numbered strands are placed midwise or staggered of each other. In thus forming a band the joints of half or more of the strands, for instance the even numbered strands, will overlap the joints of the odd numbered strands. The strands of hairs so formed are arranged side by side, and are held in this position by connecting the joints 25 and 26, of the odd and even numbered strands with each other in the manner shown in Fig. 12.

To render the band 7, operative especially during use, it is necessary to rub rosin into the same. For this purpose the rosin consists of a block 27, which is placed within the band 7, and between the driving-pulley 8, and the side 102, of the sounding-box 1, and is held in engagement with the band by a spring 29, secured to the side 102, of the sounding-box 1, as shown in Figs. 2 and 3. In order to permit of an economic use and even wear of the block of rosin 27, the same as shown in dotted lines in Fig. 1, and in full lines in Fig. 13 is rotatably mounted in a block 28, which is slidably arranged in a bracket 110, secured to the end 102, of the sounding-box 1. A rod passing through a movable bearing 33, secured to the end 102, of the box 1, engages the block of rosin 27, and by being reciprocated by means of a friction disk 31, imparts to the block of rosin, a step by step rotary movement, in one direction. The disk 31, is driven by a friction disk 30, mounted on the shaft 13, for the driving pulley 8, and is held in frictional engagement, with the disk 31, by a spring 112, surrounding the shaft 13, and supported thereon, by the pulley 107, as shown by dotted lines in Fig. 1.

In order to sound the strings 2, by the band 7, the strings must be brought into engagement with the same, which is accomplished in the following preferred manner. As shown in Figs. 2, 6 and 7, each of the strings 2, is engaged by a bridge 36, of substantial triangular outline, the apex or bearing portion 37, of which is grooved to receive a string 2. As shown in Fig. 6 the base 38 of each of the bridges 36, is tapered and engages a groove 39, arranged in a substantially T-shaped support 34, the shank 35 of which by means of a bolt 83, is secured to the respective curved sides 100 and 101, of the sounding-box 1, while the extension 84, thereof, rests loosely upon these sides, and is engaged by a rod 50, passing through openings 82, arranged in the sides and rests against the curved side opposite to that to which the respective stationary bridge portions 35 are secured, as shown in Fig. 6. The vibrations transmitted by the strings 2, to the movable portion 36, of the bridge and by the same to the stationary portion thereof, are transmitted by the stationary portion first to the side

of the sounding-box 1, to which the bridges are secured and by means of the shank 84, of the stationary portion of each of the bridges and the respective rods 50, connected therewith are transmitted to the opposite side of the box 1. Thus both sides 100 and 101, of the sounding-box 1, will be vibrated and the volume of tone thereby considerably increased.

In Figs. 1 and 6, is shown an arrangement by means of which two strings tuned to the same pitch, and located on opposite sides of the sounding-box 1, can simultaneously be moved against the band 7, by operating one and the same key 40. For this purpose each of the keys 40, is provided with an arm 41, to which is secured a wire 42, directly connected with the movable bridge portion 36, which by means of the stationary portion 34, is connected with the side 100, of the sounding-box 1. To each of the wires 42, by means of a clamp 43, is secured a second wire 44, which passes through the opening 45, of the movable bridge-portion 36, and openings 46 and 47, arranged in the respective sides 100 and 101, of the sounding-box 1, and at the rear side thereof, is connected with the movable bridge portion 48, by an arm 49, projecting therefrom. By depressing the key 40, by hand or by actuating the cord 42, for instance by pneumatical or electrical means, not shown, the movable parts 36 and 46, of the bridges on opposite sides of the sounding-box 1, and by same the strings 2, connected therewith are brought into engagement with the band 7, and are simultaneously sounded. The transmission-rods 50, will also in this instance, transmit the vibrations of the individual bridges and sides of the sounding-box, in such a manner, as not to disturb but rather to support one another, in their effect.

In order to permit of the sounding of the bass strings by foot-pedals, which is of particular advantage, when the instrument is to replace an entire orchestra, and when more notes are to be sounded than a player by hand simultaneously can operate the following pedal device, is employed. As shown in Figs. 1, 2 and 3, the device, consists of treadles 51, pivotally secured at the point 52, to a common support 53, and held in their normal inoperative position, by means of springs 54, carried by the support 53. The treadles when depressed against the tension of the springs 54, depress one end of the levers 56, pivotally secured at the point 55, to a support 114, which lift rods 57, pivotally connected therewith, engaging the underside of the arms 41, of the keys 40, and thus actuating the keys which when actuated bring the strings 2, into engagement with the band 7, in a manner hereinbefore described. The support 53, for the treadles is pivotally secured at the point 60, to the frame 115, of the instrument and can therefore be swung upwards into a vertical inoperative position, when not in use.

The device for producing flageolet tones, consists of strips or bars 61 and 68, the bar 61, of which, is arranged transversely to the strings 2, secured to the front side 100 of the sounding-box 1, while the bar 68, is arranged in a similar position opposite the side 101, of the sounding-box 1, as shown in Fig. 1. Each of the bars 61 and 68, is pivotally supported by brackets 65, secured to the sounding-box 1, and is provided with a series of yielding dampers 85, one for each of the strings 2. The dampers 85, are provided with a soft covering, and serve by limiting the movement of the strings towards the endless band 7, to decrease the volume of tone of the strings 2, which is produced by more or less moving the same away, from the sounding-box 1, by the bridges 36. The bar 61, and by the same, the dampers connected therewith is actuated by a draw-stop 62, which by means of a lever 63 and a link 64, is connected with the bar 61, as shown in Figs. 1 and 2. The movement of the bar 61 by means of the lever 63, links 66, and a lever 116, pivotally connected at the point 117, to the end 102, of the sounding-box 1, is transmitted to the bar 68, and its dampers 85, which are thus brought into engagement with the strings 2, at the rear side of the sounding-box 1, and both sets of strings 2, simultaneously produce flageolet tones. By omitting the bar 68, of the set of strings 2, at the rear side 101, of the sounding-box 1, this set of strings, will be sounded in their primary key.

In order to damp the sounding strings, as is effected in every piano, the following preferred mechanism is employed:—As shown in Figs. 1, 2 and 10, to each side of the sounding-box 1, by means of brackets 118, are slidably secured dampers 69, which are provided with blocks 70, of elastic material, against which the strings lie, when returned into their normal inoperative position. When the dampers 69, are shifted, so as to move the blocks thereof out of the path of the strings, the same will vibrate after the keys, have been released. This is accomplished, by a bell crank lever 87, actuated by a draw-stop 86, which is directly connected with the damper 68, secured to the front side 100, of the sounding-box 1, and the movement thereof, by means not shown, is transmitted to the damper 69, connected with the rear side 101, of the sounding-box 1.

In Figs. 7 and 8, two forms of a device, for producing a tremolo effect are represented, which serve for imitating vibrations, which are obtained on the violin, by moving the finger which depresses the string. In Fig. 7, which is a view of one form of a device, for this purpose, a tremolo-bar 72, is arranged

transversely to the set of strings 2, and opposite the bridges 36, for the same and is covered with a strip of yielding material 73, such as leather or the like, on the side facing the strings. This bar 72, is quickly brought into and out of engagement with the strings 2, by a lever 91, held in engagement with a cam 89, by a spring 90, which cam 89, when rotated by a shaft 88, driven by the main driving shaft 10, by means not shown, imparts an oscillatory movement to the lever 91. When the strings 2, are moved against the band 7, the strings contact with the covering 73, and are thereby vibrated to a less extent.

In the form represented in Fig. 8, the above described tremolo-bar 72, acts against the part 74, of the strings 2, located between the bridges 3, and pegs 104 and pegs 105, respectively, on the sides of the sounding-box 1, thereby changing the tension of the strings. By using two bands 7, and by halving one or more strings of the same key, on each side of the sounding-box 1, by the movable part 36, of the bridge, in the manner shown in Fig. 5, two four eight or more strings can be bowed simultaneously.

The device actuated by foot power for driving the shaft 10, must be arranged in such a manner, that the band is always moved in the same direction. For this purpose, the treadle 11, acts by means of two driving members or cords 75 and 76, on two sockets 77 and 78, which are loose on the shaft 10, on which sockets friction or coupling blocks 79 and 80, are revolubly arranged, as shown in Figs. 1, 2 and 4. The device acts in such a manner, that when the treadle 11, is moved downwards, the friction block of the one socket, and when the treadle moves upwards, the friction block of the other socket rotates the pulley 81, keyed on the shaft 10, in one direction between the two sockets 77 and 78.

Having thus described the nature and objects of my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a piano violin, a sounding-box, a set of strings of gradually decreasing length arranged on each side of said sounding-box, the sides of said sounding-box having in planes at right angles to said strings a gradually decreasing radius of curvature in the direction of the increase in length of said strings and an endless band for bowing the strings.

2. In a piano violin, a sounding-box, a set of strings arranged on each side of said sounding-box, an endless band surrounding said sounding-box and passing over said strings, fixed and movable means for supporting and driving said band, said movable means arranged to permit of the increase or decrease of the tension of said band.

3. In a piano violin, a sounding-box, a set of strings arranged on each side of said sounding-box, an endless band movably surrounding said sounding-box and passing over the strings thereof, fixed bridges and bridges having a movable member, said movable member engaging said strings and adapted, when actuated, to bring the same into engagement with said band.

4. In a piano violin, a sounding-box having sides, a set of strings arranged on each of the sides thereof, an endless band movably surrounding said sounding-box and passing over said strings, fixed bridges and bridges having a movable member carried by the respective sides of said box, said movable member engaging a string of said set of strings and arranged, when actuated, to bring the string into engagement with said band, and means connected with the stationary portion of said bridges and extending through the side of said box carrying the same and contacting with the side opposite the carrying side.

5. In a piano violin, a sounding-box having curved sides the radius of curvature gradually decreasing towards one end thereof, a set of strings carried by each of the sides of said sounding-box, an endless band movably surrounding said sounding-box and passing over the strings thereof, guides for holding said band out of engagement with said strings and means for bringing said strings into and out of engagement with said band.

6. In a piano violin, a sounding-box having curved sides the radius of curvature gradually decreasing towards one end thereof, a set of strings carried by each side of said sounding-box, an endless band movably surrounding said sounding-box and passing over the strings thereof, means for driving said band, guides for said band holding the same out of engagement with said strings, and means for bringing said strings into and out of engagement with said band.

7. In a piano violin, a sounding-box having sides, two sets of strings located on opposite sides of said box, a set of tuning pins on each side of said sounding-box engaging said strings, the pins on the rear side of said sounding-box extending through and terminating beyond the front side to permit of the actuation of both sets of pins from the front side of the box, an endless band movably surrounding said sounding-box and passing over the strings thereof, means for driving said band, guides for said band holding the same out of engagement with said strings, and means for bringing said strings into and out of engagement with said band.

8. In a piano violin, a sounding-box, a set of strings arranged on each side of said sounding-box, an endless band surrounding said sounding-box and passing over the strings thereof, means for driving said band in one direction, a holder carrying a piece of

rosin, means for moving the rosin in said holder to press the same against said band and means for imparting to the rosin a rotary movement.

9. In a piano violin, a sounding-box, a set of strings arranged on each side of said sounding-box, an endless band surrounding said sounding-box and passing over the strings thereof, means for driving said band in one direction, a holder carrying a piece of rosin, means for moving the rosin in said holder to press the same against said band and means for imparting to the rosin a step by step movement, in one direction.

10. In a piano violin, a sounding-box, bridges each consisting of a stationary part having a groove forming a bearing surface and carried by said sounding-box and of a movable part having a tapering base loosely engaging the stationary part by entering the groove thereof, strings carried by said sounding-box, each of said strings by engaging the movable part of one of said bridges adapted to hold the same in engagement with the groove of said stationary part, an endless band surrounding said sounding-box and passing over the strings, means for driving said band, keys, means connecting each of said keys with the movable part of one of said bridges, said keys arranged, when depressed to actuate by said connecting means the movable parts of said bridges to bring strings engaged by the same into contact with said band.

11. In a piano-violin, a sounding-box, strings carried by said sounding-box, bridges each, consisting of a stationary part carried by said sounding-box having a groove forming a bearing surface and a part of substantially triangular outline having a tapering base loosely engaging the groove of the stationary part and held by the same approximately parallel to said strings, said strings arranged by engaging the apex of the loose parts of said bridges to hold the tapering base in engagement with the groove of the stationary part thereof so as to connect the bridge parts with each other, an endless band surrounding said sounding-box and passing over the strings, means for driving said band, keys, means connecting each of said keys with the movable part of one of said bridges, said keys arranged when depressed to actuate the movable bridge parts and to bring the strings engaged by the same into contact with said band.

12. In a piano violin, a sounding-box, strings carried by said sounding-box, bridges, each consisting of a movable part substantially triangular in outline having at its apex a groove to receive one of said strings and opposite the apex a broad tapering base, and a T-shaped stationary part carried by said sounding-box having at one side of its projecting portion a groove engaged by the tapering base of the movable part so as to hold the same in a position approximately parallel to the engaged string, an endless band surrounding said sounding-box and passing over said strings, keys connected with the movable parts of each of said bridges and the movable parts of said bridges arranged when actuated to bring the strings engaged by the same without increase in tension into contact with said band.

13. In a piano violin, a sounding-box, pins arranged on each side of the same, strings secured at the lower end to said sounding-box and at the upper end to said pins, bridges, each consisting of a substantially T-shaped stationary part carried by said sounding-box and a substantially triangular movable part carried by the stationary part and engaging one of said strings, an endless band surrounding said sounding-box and passing over the strings, means for driving said band, keys, an arm connected with each of said keys, a wire connecting each of said arms with the movable part of one of said bridges, said arms, strings and the movable parts of said bridges adapted when actuated by said keys to bring said strings into contact with said band.

14. In a piano violin, a sounding-box having a front and rear side provided with openings, a set of strings arranged on each side of said sounding-box, bridges, each consisting of a stationary part connected with one side of said sounding-box and a movable part carried by the stationary part engaging a string and having an opening, an endless band surrounding said sounding-box and passing over said set of strings, means for driving said band, keys, arms attached to said keys, a wire connecting the arm of each of said keys with the movable part of one of said bridges arranged on the front side of said sounding-box, a second wire passing through the openings in the sides of said sounding-box and connecting the movable part of one of the bridges on the rear-side with the first wire, said arms and first and second wires in conjunction with the movable parts of said bridges adapted when actuated by said keys to bring the strings on both sides of said sounding-box simultaneously into engagement with said band.

15. In a piano violin, a sounding-box having oppositely arranged sides, strings arranged on each side of said sounding box, bridges carried by the sides of said sounding-box, each consisting of a stationary part and a movable part oscillatingly supported by the stationary part and engaging one of said strings, means connected with the stationary part of each of said bridges and contacting with the side of said sounding box opposite to the side carrying the bridges to transmit vibrations to such side, an endless band surrounding said sounding-box and passing over

the strings, means for driving said band, keys, means connecting each of said keys with the movable part of each of said bridges, said keys and movable bridge-parts when actuated adapted to bring said strings into contact with said band.

16. In a piano violin, a sounding-box having front and rear sides, tuning pins arranged on each side of the same, strings secured at one end to said sounding-box and at the other end to said pins, bridges located on opposite sides of said sounding-box each consisting of a stationary part carried by one side of said sounding-box and a part engaging a string and movably supported and held substantially parallel to the string by the stationary part, vibrating transmission-rods connected to each of the stationary parts of said bridges and to the side of the sounding-box opposite to the side carrying the stationary bridge-part, an endless band, means for driving said band around said sounding-box and over the strings, keys, arms attached to said keys, and a wire connecting each of said arms with the movable part of one of said bridges on each side of said sounding-box, said keys and movable bridge-parts when actuated adapted to bring the strings passing over the same simultaneously into engagement with said band.

17. In a piano violin, an endless band, consisting of strands of hair, each strand formed of sections bent outwardly at their ends and connected with each other at said ends, the ends of the sections of the odd and the ends of the sections of the even strands being staggered and means for separately connecting the projecting ends of the odd and even numbered strands of hair in position alongside and in alinement with each other.

18. In a piano violin, a sounding-box having oppositely arranged sides, strings arranged on each side thereof, bridges, each consisting of a stationary part and a part movably supported by the same engaging and dividing a string into two sections, two endless bands surrounding said sounding-box and passing over said strings, and means for swinging the movable parts of said bridges to bring each of said strings into engagement with said bands.

19. In a piano violin, a sounding-box having curved sides increasing in curvature towards one end thereof, strings mounted on each side of said sounding-box and increasing in length towards the end of increased curvature thereof, an endless band surounding said sounding-box and passing over the strings thereof, means for moving said band in one direction and for holding the same under tension, and means for moving said strings against said band.

20. In a piano violin, a sounding-box having curved sides increasing in curvature towards one end thereof, strings mounted on each side of said sounding-box and increasing in length towards the end of increased curvature thereof, an endless band surrounding said sounding-box and passing over the strings thereof, means for moving said band in one direction and for holding the same under tension, means for moving said strings against said band, and a bar carrying dampers connected with said sounding-box and held by the same in a position transverse to said strings.

21. In a piano violin, a sounding-box having curved sides increasing in curvature towards one end thereof, strings mounted on each side of said sounding-box and increasing in length towards the end of increased curvature, an endless band surrounding said sounding-box and passing over the strings, means for moving the band in one direction and holding it under tension, means for moving the strings against the band, and movable bars carried by said sounding-box having dampers respectively held by the same on each side of the sounding-box in a position transverse to said strings.

22. In a piano violin, a sounding-box having a front and rear side provided with openings, a set of strings arranged on each side of said sounding-box, bridges arranged on each side of said sounding-box, each of said bridges consisting of a stationary part connected with the respective side of said sounding box and a movable part having an opening and engaging a string and held by the same in engagement with the stationary part, an endless band surrounding the sounding-box and passing over said set of strings, means for driving said band, keys, arms attached to said keys, a wire connecting the arm of each of said keys with the movable part of one of said bridges on the front side of said sounding-box, a second wire passing through the openings in the sides of said sounding-box and connecting the movable part of one of said bridges on the rear-side thereof with the first wire whereby strings on both sides of the sounding-box are brought simultaneously into engagement with said band, and treadles having rods engaging the arms of certain of said keys.

23. In a piano-violin, a sounding-box having curved sides increasing in curvature towards one end, strings mounted on each side of said sounding-box and increasing in length towards the end of increased curvature, an endless band surrounding said sounding-box and passing over the strings, means for moving said band in one direction and for holding it under tension, means for moving said strings against said band, movable bars having arms and slidable bars having blocks, the arms and blocks of said bars arranged when brought into engagement with said strings to damp the sound thereof.

24. In a piano violin, a sounding-box, hav-

ing curved sides increasing in curvature towards one end, strings mounted on each side of said sounding-box and increasing in length towards the end of increased curvature, an endless band surrounding said sounding-box and passing over the strings, means for moving said band in one direction and holding it under tension, means for moving said strings against said band, movable bars having arms, slidable bars having blocks and vibrating bars carried by said sounding-box and forming dampers held by the said sounding-box in a position transverse to said strings.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

OSCAR KURTZ.

Witnesses:

FRANZ REITER,

ROBT. W. HEINGARTNER.