

No. 822,666.

PATENTED JUNE 5, 1906.

W. H. HOSCHKE.

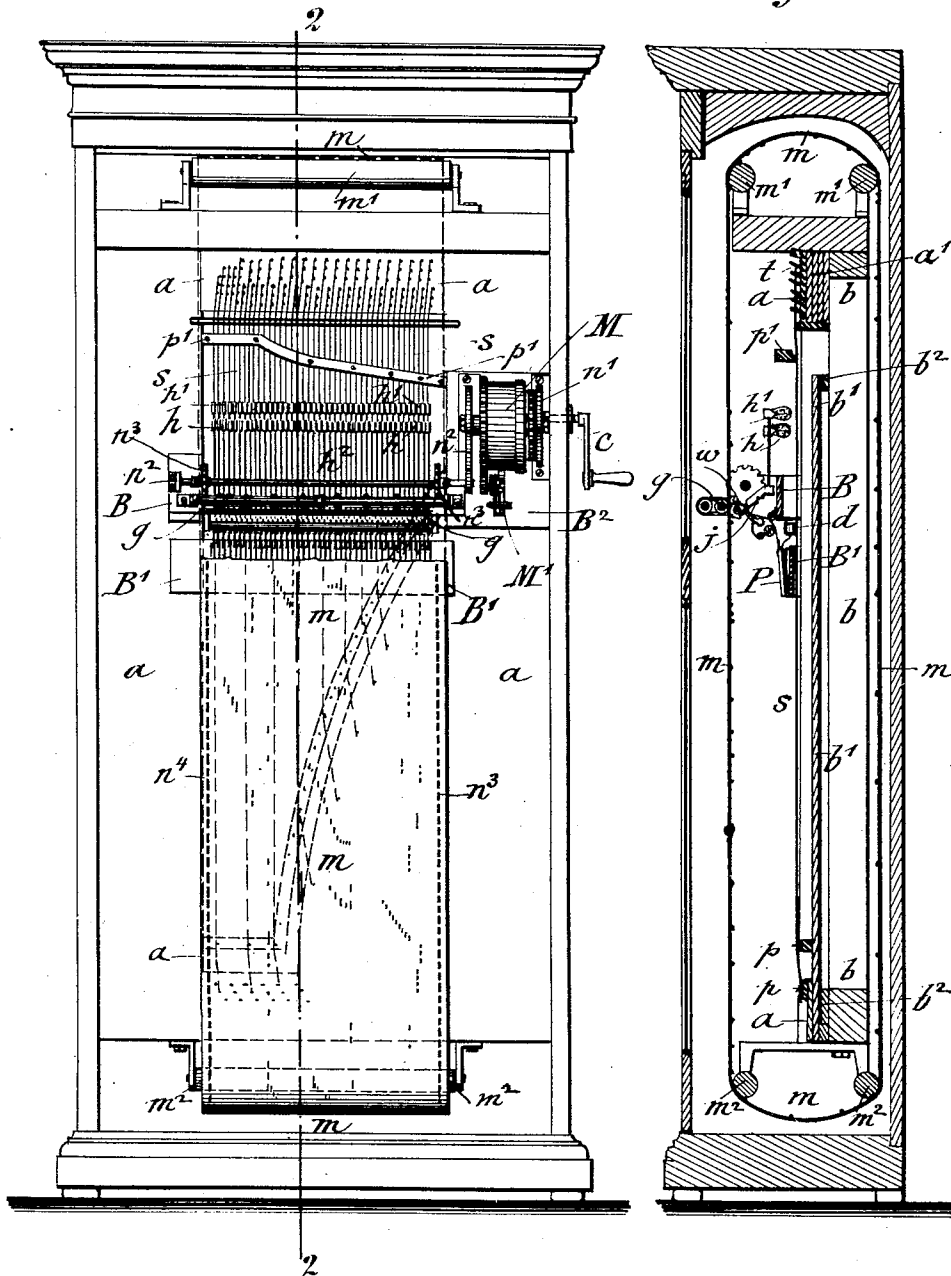
MECHANICAL MUSICAL INSTRUMENT.

APPLICATION FILED MAY 1, 1905.

3 SHEETS—SHEET 1.

Fig: 1.

Fig: 2.



Witnesses
Henry J. Schrier
Ella Newbury

Inventor
William H. Hoschke
 By his Attorney *James C. Cooper*

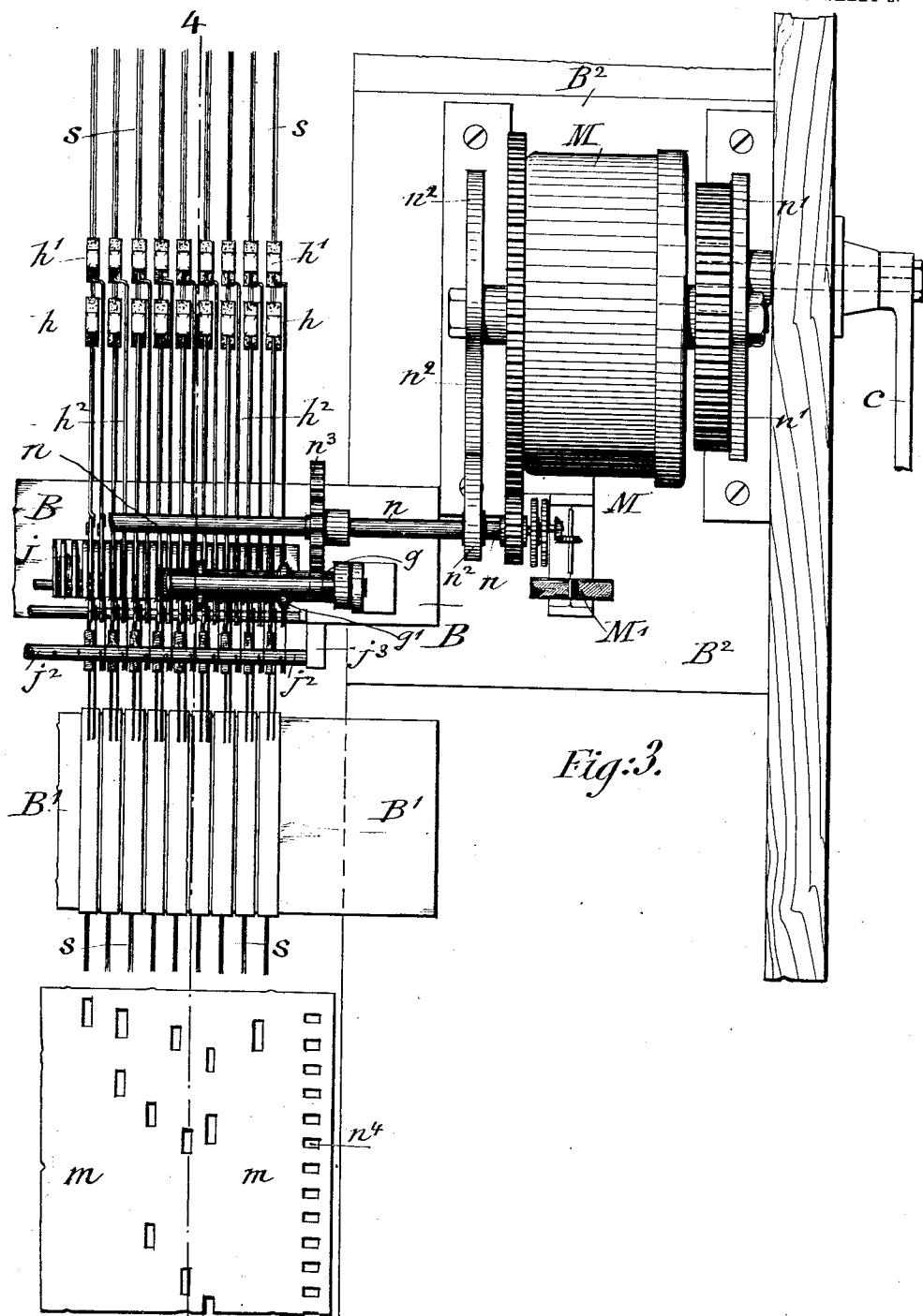
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3 SHEETS—SHEET 2.



Witnesses 4
Harry J. Sulzbier.
Elsa Hennberg

Inventor
William H. Hoschke
By his Attorney
Paula Greue

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W. H. HOSCHKE.

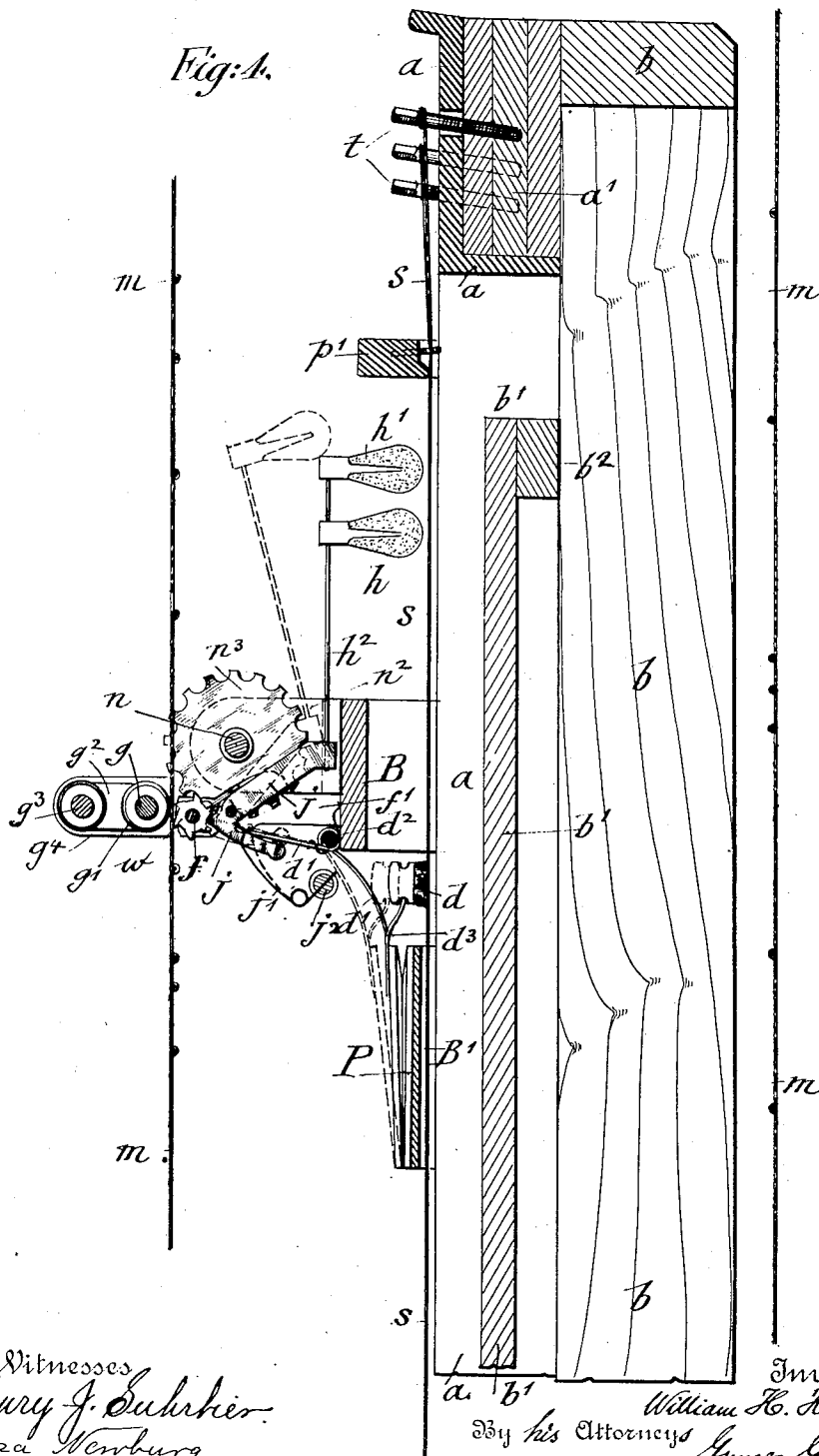
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3 SHEETS—SHEET 3.

Fig. 4.



Witnesses
Henry J. Suhrkier
Elsa Wenburg

Inventor
William H. Hoschke
 By his Attorneys *James Cooper*

UNITED STATES PATENT OFFICE.

WILLIAM H. HOSCHKE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF
TO THE PIANOVA COMPANY, OF NEW YORK, N. Y., A CORPORATION
OF NEW JERSEY.

MECHANICAL MUSICAL INSTRUMENT.

No. 822,666.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed May 1, 1905. Serial No. 258,282.

To all whom it may concern:

Be it known that I, WILLIAM H. HOSCHKE, a citizen of the United States, residing in New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Mechanical Musical Instruments, of which the following is a specification.

This invention relates to improvements in mechanical instruments, and more particularly to automatic or self-playing musical instruments, in which the strings or other sounding devices are sounded by means of keys which are operated by an endless perforated music-sheet.

Among the objects of the invention is the provision of improved mechanism for vibrating the strings.

The invention also seeks to provide improved damper-controlling mechanism and improved means for actuating the music-sheet.

With these and other ends in view the invention consists in the novel features, arrangements, and combinations of parts to be fully described hereinafter, and finally pointed out in the claims.

In the accompanying drawings, Figure 1 is a front elevation of my improved mechanical musical instrument, in which the perforated music-sheet is broken off at its upper part, so as to show the strings and the actions for the same. Fig. 2 is a vertical transverse section on line 2 2, Fig. 1. Fig. 3 is a detail front elevation of the springs, actions and the spring-motor for driving the music-sheet, drawn on a larger scale; and Fig. 4 is a vertical transverse section on line 4 4, Fig. 3.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

The improved musical instrument is built on the style of an upright piano, but with a smaller number of strings, so as to bring them together within the reach of the perforated endless music-sheet employed for actuating the instrument. It is provided with an upright string-frame *a*, which is supported on a wooden frame *b*, on which the sounding-board *b'* is supported by cleats *b²* in the usual manner. At the upper part of the string-frame *a* is arranged a wrest-plank *a'*, in

which the tuning-pins *t* for the strings *s* are inserted in the usual manner. The strings are applied at their lower ends to the usual straining-pins *p* on the sounding-board bridge and at the lower part of the string-frame and held in position near the upper tuning-pins by a well-known agraffe-bar *p'*, which extends transversely across the strings. Each note within the range of the instrument is represented by two or more strings, each set of strings being actuated by means of a double row of hammers *h h'*, the shanks *h²* of which are inserted at their lower ends into the upper socket-shaped ends of elbow-shaped hammer-butts *J*, which are pivoted to a common fulcrum-rod extending transversely of the strings and mounted in forwardly-projecting bracket-arms *f''*, attached to a bridge *B*, which is supported on the string-frame *a*. The hammers are held normally away from the strings. The lower arms of the hammer-butts *j* are connected with the free ends of tension-springs *j'* the opposite ends of which are applied to a transverse rod *j²*, which is supported in brackets *j³*, extending downwardly from the bridge *B*. The lower arms of the hammer-butts *j* engage the upper ends of spring-actuated damper-levers *d'* for a single series of dampers *d*, said damper-levers being applied to a fulcrum-rod *d²*, supported at the lower part of the bridge *B*, the lower end of said damper-levers being connected with the damper-shanks *d³*, to which the dampers *d* are attached and with the movable members of a series of pneumatics *P*, which are supported on a second bridge *B'* below the bridge *B*, as shown clearly in Fig. 4, the bridge *B'* being, like the bridge *B*, supported on the metallic string-frame *a*.

The elbow-shaped hammer-butts *j* form a sharp point at their angles, their points being engaged by the teeth of star-wheels *w*, of the well-known construction, which are placed loosely on a transverse shaft *f*, supported on the brackets *f'*, as many star-wheels being arranged as there are hammer-butts. The star-wheels *w* are separated in the usual manner by metal disks or washers, or placed in slotted racks, so as to provide for the proper spacing of the same and hold them in their proper relative position toward the pointed elbow of the hammer-butts. The

hammer-heads of the double rows of hammers are arranged one below the other, two for each string, the shanks of the upper hammers being bent or offset adjacent to the hammer-heads, so as to pass downwardly between the shanks of the lower row of hammers, as shown clearly in Fig. 4. The hammers of each group are alined with the string or strings actuated thereby, as shown. The dampers d are held normally in contact with the strings by the damper-levers and are moved away from the strings when the latter are struck by the hammers. The shanks of the dampers d are connected with the movable members of the pneumatics P , so as to move the same at each actuation of the hammer-butts away from the stationary members simultaneously with the removal of the dampers from the strings, the pneumatics serving on their collapse to retard the return of the dampers, which would otherwise take place quickly under the tension of the damper-lever springs and permit thereby the free vibration of the strings caused by the strokes of the hammers before the dampers are returned into contact with the strings. The pneumatics P permit the quick removal of the dampers from the strings, but the slow return of the same into contact therewith for interrupting the vibrations of the strings, as the collapsing of the pneumatics takes place slowly owing to the slow escape of the air from the same. The hammer-butts j , hammers h , dampers d , and pneumatics P are actuated by a traveling perforated music-sheet m . The arrangement of a pair of hammers for each string permits the string to be sounded by the stroke of one hammer, or by the stroke of both hammers simultaneously or alternately in rapid succession by the alternating actuations of the two hammers, so that the expression of the piece of music played on the instrument may be varied by producing pianoforte, sostenuto repetitions, &c., without requiring any special expression mechanisms.

The music-sheet m is made of sufficient length and connected at its ends after being placed in position. It is guided over rollers m' m'' , located at the upper and lower parts of the frame b . The music-sheet is provided with inwardly-projecting teeth of any approved construction. As shown, these teeth are bent up from the sheet, forming slots or openings therein. The endless music-sheet has, owing to its extra length, the advantage of permitting the playing of pieces of music of greater length, such as overtures, operatic selections, &c., or dance-music, in which the movements are repeated, without replacing the music-sheet. This forms a main advantage of the instrument, as it not only increases the attractions, but also the practical utility of the same, as it can be used whenever select pieces of music are desired,

or when it is to be used for playing for a dance.

In front of the gang of star-wheels w is supported a retaining-bar g , which is provided with spaced rollers g' , arranged equidistantly from each other and pressing on the smooth or outer face of the perforated music-sheet m , so as to hold it in engagement with the teeth of the star-wheels w . The retaining-bar g is supported at the ends in links g'' , which are attached to a second bar g''' , parallel with the retaining-bar g , and supported in bearings of the horizontal brackets g^4 , as shown clearly in Fig. 3. As the bar g''' turns in the brackets g^4 , the returning-bar g has a slight oscillating motion, so as to yield somewhat to the music-sheet as the same is passed through between it and the star-wheels. The pivoting of the retaining-bar g also permits it to be swung up sufficiently when removing the music-sheet and replacing it by a new one without injury to the teeth of the same.

The motion of the perforated music-sheet is controlled by a spring-motor M , which is wound up in the usual manner by a detachable hand-crank c and intermediate gearing, as shown in Figs. 1 and 3, the winding-gear of the motor being provided with the usual check-pawl for preventing the unwinding of the spring-barrel. The barrel of the motor M transmits motion by a gear-wheel transmission to the regulating-fly M' and to an intermediate shaft n , the fly mechanism serving to regulate the speed of the motor and of the intermediate transmitting-shaft n in the manner well known in music-boxes and similar instruments. The spring-motor and the intermediate shaft n are supported in bearings of brackets n' n'' , attached to a supporting-plate B^2 and the opposite end of the bridge B . A suitable clutch mechanism (not shown) is employed for stopping or starting the motor. The spring-motor can also be started by means of a "coin-operated" attachment when such an attachment is desired to be used in connection with the instrument. On the intermediate shaft n are mounted driving-gear wheels n^3 , which engage equidistant marginal perforations n^4 , arranged along both sides of the traveling music-sheet, so as to move it around its guide-rollers until the entire piece which is represented in the music-sheet is played. The motion of the music-sheet produced by the intermediate shaft n in connection with the pressure of the retaining-bar and rollers on the same produces the proper engagement of the projections of the music-sheet with the star-wheels w and by the same the proper actuation of the hammers and dampers, the star-wheels following the motion of the teeth and perforations of the music-sheet and forming the transmitting mechanisms for the hammer and damper actions.

The music-sheet can be readily changed by separating the ends of the same and then re-

moving it from the instrument by lifting the retaining-bar. A new sheet is then placed in position by passing it through the space between the retaining-bar and the star-wheels, 5 guiding it over the top rollers until it arrives at the lower rear part of the instrument and then moving it forward at the lower part for connecting the ends.

The advantages of my improved mechanical musical instrument are that the same is 10 practically a small piano in which all the parts of an upright are combined on a smaller scale and actuated and automatically played by an endless music-sheet driven by a long- 15 running spring-motor. The entire mechanism is inclosed in a case which may be provided with glass doors in the front so as to be protected against dust; that long pieces of music or several short pieces of dance-music 20 can be played by one music-sheet, as the same is about five times the length of the ordinary music sheets or disks heretofore employed in such instruments; that by one winding of the spring-motor the instrument will play for 25 from twenty-five to thirty minutes without rewinding; that electrical motors, which are not always available and which require special electrical connections, are dispensed with; that the instrument can be used in all public 30 places where piano-music is desired for entertainment without requiring a professional piano-player, such as refreshment-parlors, cafes, dancing-pavilions, and other places of amusement; that it is also attractive for 35 family use owing to the better selections of music which can be produced; that the music-sheets can be conveniently wound up on a roll so as to be immediately ready for insertion and use in the instrument, and that the 40 actuating mechanism is simple in construction and not to be liable to get out of order, while the music produced is that of a sweet-toned piano played by an accomplished musician.

45 Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a mechanical musical instrument, the combination, with the string elements, of a 50 group of hammers for each element, the hammers in each group having a common axis of movement and being alined with the string element actuated by said hammers.

2. In a mechanical musical instrument, the 55 combination, with the string elements, of hammers for actuating said elements, said hammers being arranged in groups, one group for each element, and having a common axis of movement, and means for simultaneously actuating the hammers of each 60 group.

3. In a mechanical musical instrument, in combination with strings, hammers for actuating the same arranged in groups, one 65 group for each string, the hammers in each

group having a common pivot but being independently operable.

4. In an instrument of the class described, a plurality of strings, a group of hammers for each string, all of the hammers having a common pivot, and means for simultaneously or 70 independently actuating the hammers in each group.

5. In a musical instrument, in combination, a plurality of strings, and a group of hammers 75 for each string, the hammers in each group having a common axis of movement.

6. In a musical instrument such as described, the combination of the strings, the hammers arranged in transverse rows and in 80 groups made up of hammers in alinement longitudinally with respect to the strings, all of said hammers having a common pivot, and the means for actuating hammers in each row simultaneously with or independently 85 of the hammers in the other row.

7. The combination, with the strings, of hammers arranged in transversely-disposed rows and in groups made up from hammers in both rows, the hammers in each group 90 having a common axis of movement, and hammer-actuating means.

8. In a musical instrument, the combination, with the dampers, of suction-operated means for retarding the return movement 95 thereof.

9. In a musical instrument, the combination with the dampers, of suction-operated retarding means in operative connection 100 with each of the same.

10. The combination, with the dampers and damper-shanks, of suction-operated retarding means attached to said damper-shanks.

11. In a musical instrument, the combination, with the dampers and damper-shanks, of pneumatics attached to said damper-shanks. 105

12. In a musical instrument, the combination, with the strings, of a row of dampers extending transversely across the same, a 110 bridge also extending transversely of said strings, and pneumatics mounted on said bridge and having their movable members attached to said dampers. 115

13. In a musical instrument, the combination of the strings, a bridge extending across the same, elbow-shaped hammer-butts pivoted upon said bridge, means for actuating said hammer-butts, a second bridge below 120 the first, dampers mounted on said second bridge, and damper-levers pivoted on the first bridge and attached at one end to the damper-shanks, the opposite end of said levers engaging the lower legs of said hammer-butts. 125

14. In a mechanical musical instrument, the combination of a plurality of strings, a group of dampers having a common axis of movement, a damper-lever for each damper, ro- 130

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tary actuating devices, pivoted hammer-
butts engaged by said actuating devices and
in operative connection with said dampers,
and a pneumatic connected with each
5 damper-lever for retarding the return move-
ment of the dampers.

In testimony that I claim the foregoing as

my invention I have signed my name in pres-
ence of two subscribing witnesses.

WILLIAM H. HOSCHKE.

Witnesses:

PAUL GOEPEL,

HENRY J. SUHRBIER.