

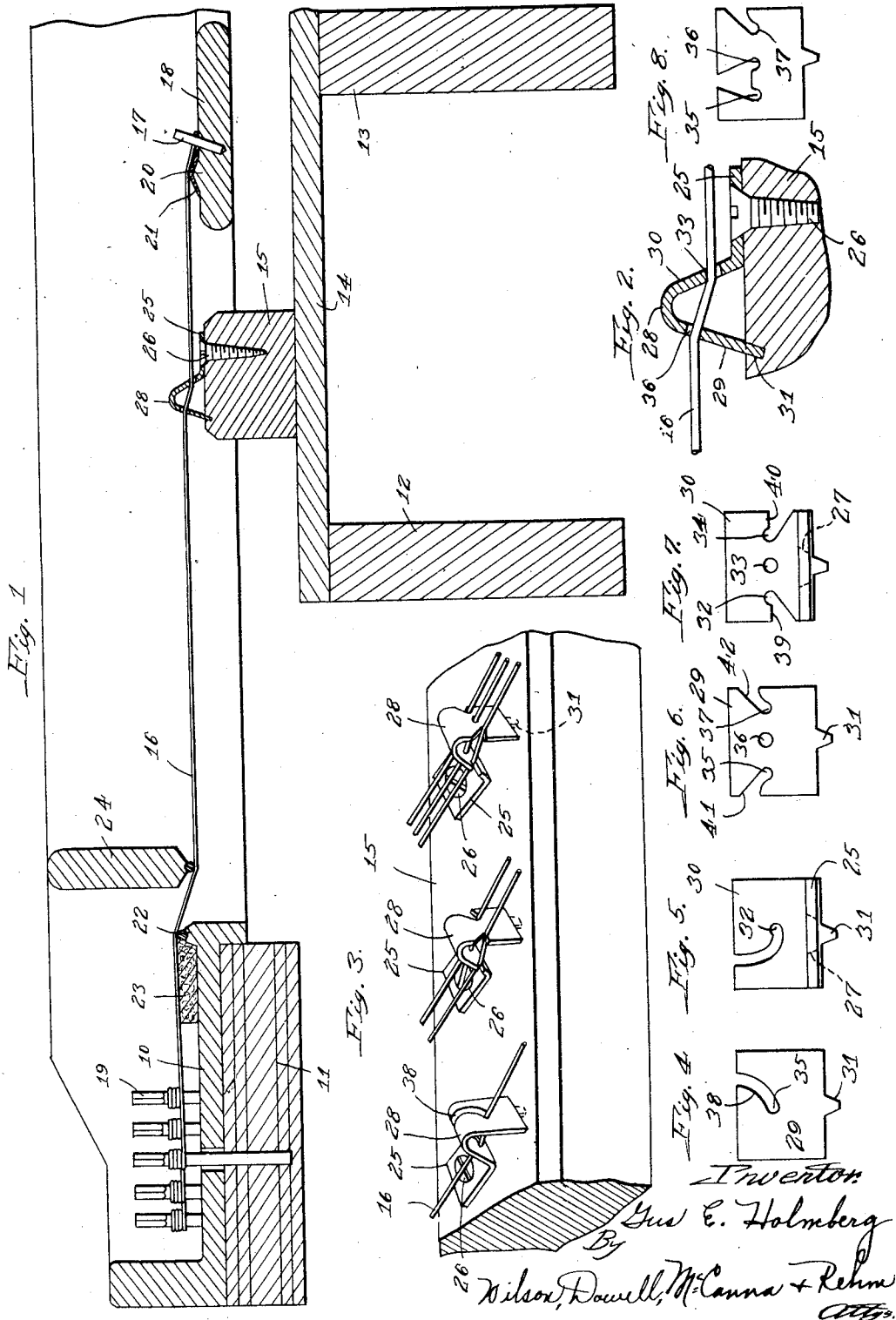
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AGRAFFE

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AGRAFFE

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My invention relates too improved means for limiting the amplitude of vibration of piano strings and has particular reference to a new and improved type of agraffe.

5 In the manufacture of pianos it is essential that the strings be held firmly against the bridge of the piano. This has been customarily accomplished through the provision of a plurality of pins slightly staggered with respect to the direction of the string, the string passing on opposite sides of adjacent pins in contact with the bridge whereby a lateral bend is formed in the taut string. This construction not only serves to 10 secure the string to the bridge whereby vibrations are transmitted to the sounding board but acts to relieve a portion of the tension on the hitch pins. Various other devices have been provided for the purpose of securing the string to the bridge but none of them have, until now, proved to be entirely satisfactory, with the result that, at the present time, substantially the entire industry still employ the old fashioned bridge pin. 20 Some of these devices are so designed as to be in contact with the strings over a considerable length thereof which is undesirable in that it results in a bulky construction. Other devices consist of a number of pieces which are costly to manufacture and difficult to properly secure in position upon the bridge. Some of the agraffes have failed to eliminate the side strain on the bridge and sounding board. Still others have been so 30 designed that they become loosened after the instrument has been in service a short period of time, thus materially affecting the tone of the piano. Other agraffes impart a metallic color to the tone of the piano.

40 I have aimed to provide a one-piece agraffe which may be manufactured at a cost substantially lower than has heretofore been possible.

45 Another object of the invention is the provision of an agraffe which has contact with the strings of the piano over only a very short distance.

50 I have also aimed to provide an agraffe which will not become loose upon the bridge

should the securing means become slightly loosened therefrom.

A still further object of the invention is the provision of an agraffe wherein the tension of the string on the bridge is downward as in the case of a violin and no horizontal tension is applied thereto. 55

I have also aimed to provide an agraffe having improved means for positioning the same upon the bridge. 60

Another object of the invention is the provision of an agraffe of a so-called dead material whereby a metallic tone is not imparted to the string.

A further object of the invention is the provision of an agraffe having improved means for rapidly securing the strings therein. 65

Other objects and attendant advantages will become apparent to those skilled in the art from the following description and the accompanying drawings in which— 70

Figure 1 is a vertical section through the plate, pin plank, bridge, and sounding board of a grand piano embodying my improved agraffe; 75

Fig. 2 is an enlarged view of the agraffe and a portion of the bridge as shown in Fig. 1;

Fig. 3 is a perspective view of the agraffe showing means for securing 1, 2, and 3 strings therein; 80

Fig. 4 is a front view and Fig. 5 is a rear view of the modification adapted to hold a single string; and 85

Figs. 6 and 7 are front and rear views, respectively, of the modification adapted to hold 3 strings.

Figure 8 shows another modification of a structure to hold three strings. 90

Referring first to Figure 1, a section is shown through a conventional grand piano having the usual plate 10, pin plank 11, lining members 12 and 13, and sounding board 14. A conventional bridge 15, is secured to the top of the sounding board 14 in the usual manner. Strings 16 are connected at one end to hitch pins 17 secured in the back member 18 of the plate 10 and at their forward ends to tuning pins 19 passing through the 100

plate 10 and frictionally secured in the pin plank 11, the strings being drawn to the desired tension by rotation of the tuning pins. A ridge 20 is positioned on the upper side of the back member 18 forward of the hitch pins 17 so that the strings 16 will bear against this ridge when drawn taut. A felt layer 21 is positioned between the strings and the ridge 20 to prevent a metallic quality from being transmitted to the strings. At the forward end of the strings 16 near the tuning pins 19 the former pass over a mute bar 22, a felt pad 23 being provided between the plate 10 and the strings to prevent audible vibration thereof. The customary Capo D-Astro bar 24 is positioned above the strings 16 slightly to the rear of the mute bar 22 and projects downward to a lower horizontal level than the upper edge of the mute bar so that when drawn taut the strings 16 will be caused to pass through an angle at the point of contact with the mute bar.

The structure so far described is intended to be merely that of a conventional grand piano, which would ordinarily be provided with a series of pins on the upper surface of the bridge 15 to connect the strings to the bridge and stop the vibrations thereof. I have, however, arranged to provide an agraffe shown more in detail in Figs. 3 to 7, which may be formed from a single piece of so-called dead material, that is, material which will not impart a metallic characteristic to the tone of the strings. I have found that the agraffe may advantageously be formed from sheet brass, or bronze, whereby the desired tonal characteristics are obtained.

The agraffe is formed from a single piece of metal to provide a flat portion 25 adapted to be secured to the top of the bridge 15 by means of a screw 26 passing through an opening 27 therein. Formed integral with the flat portion 24 is a V-shaped portion 28 providing a front side wall 29 and a rear side wall 30. It is desirable that the angle between the side walls 29 and 30 be as small as practicable in order to reduce to a minimum the length of contact between the strings 16 and the agraffe. The wall 29 of the agraffe is of such length as to project downward slightly beyond the plane of the flat portion 25 and is provided with a locating tip 31 intermediate the ends of the lower edge thereof. In positioning the agraffe upon the bridge 15 the locating tip 31 is placed over a previously located and marked point and is forced into the wood of the bridge as shown in Figs. 2 and 3, by insertion of the screw 26 at a marked point, until the lower edge of the wall 29 comes in contact with the bridge. It will be seen that since the lower edge of the wall 29 lies in a lower plane than the flat portion 25 it will be necessary to spring the metal of the agraffe slightly in order to bring the flat portion 25 in contact with the bridge 15 throughout the

entire area of its lower surface. Thus the entire agraffe is placed under a slight upward pressure whereby, should the screw 26 become slightly loosened through seasoning of the bridge 15 the agraffe will not become loose upon the bridge, but will merely spring upward slightly against the head of the screw 26.

The tip 31 serves a plurality of purposes. It serves as a locating point to indicate, in connection with the screw opening 27, the proper position of the agraffe. The tip also prevents the agraffe from turning with the screw when the latter is being inserted. It also permits the front wall to be held stationary so that the spring action may be exerted on the screw. It further prevents lateral movement of the agraffe.

Each of the agraffes may have one, two, or three openings 32, 33, and 34, in the rear side wall 30 thereof to accommodate one, two or three piano strings therein in the manner shown in Figure 2. These openings pass through the wall 30 at right angles thereto and, where more than one is provided, in a plane parallel to the flat portion 25 as shown in Figs. 6, 7 and 8. The front wall 29 of each agraffe is provided with either one, two or three openings 35, 36, and 37, similar to the openings 32, 33 and 34, in the rear side wall 30 but located in a substantially higher plane than the openings 32, 33 and 34, whereby a string 16 when passing through an opening in the wall 30 and a corresponding opening in the wall 29, will be bent through a vertical angle at the side wall 29 and at the side wall 30. Thus corresponding openings in the side walls 29 and 30 lie in the same vertical plane but not in the same horizontal plane.

In order to permit a string to be inserted in the agraffe without threading it endwise through an opening, I have provided slots which lead to the openings whereby the string may be moved transversely of its length through the slot and into the opening and whereby the string will be held firmly in the opening when drawn taut. Thus in Figs. 3, 4, and 5, wherein a single opening 32 is provided in the wall 30 and a single opening 35 is provided in the wall 29, a slot 38 serves to connect the openings 32 and 35, passing through the junction of the two walls 29 and 30. Thus a single string may be passed through the slot 38 transversely of its length and be caused to engage the openings 32 and 35, as shown in Figs. 2 and 3. On the other hand where the agraffe is to support two strings, two openings 32 and 34, are provided in the side wall 30 and two openings 35 and 37 in the side wall 29. Slots 39, 40, 41 and 42, are provided in the side edges of the walls 30 and 29, respectively, permitting one string to be inserted into the openings 32 and 35 through the slots 39 and 41 and a second string to be inserted into the openings 34 and

37 through the slots 40 and 42, respectively. If desired, the slots to the two pairs of openings may be formed through the junction between the walls 29 and 30 as shown in Figure 8, which structure will likewise permit the strings to be moved into the desired openings. Where three strings are to be positioned in the agraffe in three pairs of openings, the openings 33 and 36 shown in Figure 6, may be provided which require the string to be threaded endwise through the agraffe or alternatively the structure shown in Figure 8 may be employed whereby the string may be moved into the openings transversely. Thus in Figure 8 all three strings may be secured in the agraffe without being threaded into the opening endwise, while in the modification shown in Figs. 6 and 7, one of the strings must be threaded through the openings 33 and 36 endwise.

Figure 3 shows the three agraffes which may advantageously be employed in a piano. The one containing the single pair of openings is adapted to be employed for the base strings of the instrument where only a single string is employed for the production of a single tone. The agraffe shown at the center of this figure is that adapted to hold two strings which are employed for the intermediate strings of the piano in which two strings are employed to produce a single tone. The agraffe shown at the right is that adapted to hold three strings normally employed to produce a single tone in the higher register of a piano.

The manifold advantages of my improved construction will, doubtless, have become apparent. The agraffe is formed from a single piece of sheet material by the ordinary stamping and forming processes whereby the cost of manufacture thereof is relatively small. The two walls of the agraffe serve to securely hold the strings of the instrument at closely spaced points and do not permit of movement thereof whereby only a small amount of space on the bridge is taken up and the string remains at the desired pitch over a longer period of time than would otherwise be the case.

The tension of the string on the bridge is downward and no lateral twisting strain is imparted thereto as is the case where staggered bridge pins are employed. Because of this the bridge is not placed under a lateral tension from the great multiplicity of strings secured thereto and consequently is free to transmit the vibrations of the strings to the sounding board undistorted, thereby materially improving the tone of the instrument. In other words, the bridge is under compression but not under lateral strain.

Means are provided for accurately positioning the agraffe upon the bridge whereby lateral movement thereon through unequal tension of the strings or otherwise does not displace the agraffe.

The agraffe is placed upon the bridge under a slight tension whereby eventual loosening of the screw due to the seasoning of the wood in the bridge merely permits the agraffe to spring back slightly, thus preventing the same from becoming loose on the bridge and impairing the tone of the instrument.

The agraffe is formed from a so-called dead material which does not impart a characteristic color to the tone of the instrument and consequently does not require to be padded or muffled as is the case when steel or similar materials are employed.

I have thus described and illustrated a specific embodiment of my invention and I am aware that numerous alterations and changes may be made therein without materially departing from the spirit of the invention and the scope of the appended claims in which—

I claim:

1. In a one-piece agraffe the combination of a front and a rear wall in the form of an inverted V, the legs of which form integral rear and front walls, means for attaching said agraffe to the bridge of a piano, the bottom free ends of each of said walls being adapted to bear against the bridge of a piano, each of said walls having three openings and slots connecting therewith to permit spaced strings to be inserted therein by movement transversely of its length, two of said slots extending from the junction of said walls to an opening in each wall to permit the central string to be inserted through such transverse movement, said openings lying in different horizontal planes whereby said string, when taut, will have a downward pressure on one of said walls and an upward pressure on the other of said walls.

2. The combination in an agraffe arranged to be positioned on the bridge of a piano to support the strings thereof, of a front and a rear wall positioned transversely of said bridge, said front wall having a tip on the lower edge thereof adapted to be pressed into said bridge to prevent movement of said wall with respect thereto, and a substantially flat portion integral with said rear wall for securing said agraffe to said bridge.

3. The combination in an agraffe arranged to be positioned on the bridge of a piano to support the strings thereof, of a rear wall, a portion projecting outward from the lower end of said wall integral therewith, having an opening to receive a screw for securing said agraffe to said bridge, a front wall integral with said rear wall, a tip on the lower edge of said front wall adapted to be inserted into said bridge, said front wall being of greater length than said rear wall, whereby insertion of said tip and said screw in said bridge will cause said agraffe to be brought against said bridge under a tension to prevent said agraffe from becoming loose there-

on when said screw becomes slightly loosened.

4. An agraffe arranged to support the strings of a piano upon the bridge thereof comprising a single piece of sheet metal having bends providing a flat portion adapted to receive a screw to secure the portion against said bridge, an upwardly bent rear wall adjacent thereto and a downwardly bent front wall, said walls having openings at different horizontal levels to receive at least one string of a piano.

5. In an agraffe a one-piece body of sheet metal having a flat portion provided with an opening for the reception of a screw for securing the agraffe to the bridge of a piano, said body being bent upwardly to provide a rear wall and thence bent downwardly to provide a front wall, each of said walls having at least one opening and a slot connecting therewith to permit a string to be inserted therein by movement transversely of its length, said openings lying in different horizontal planes whereby said string, when taut, will have a downward pressure on one of said walls and an upward pressure on the other of said walls.

6. An agraffe as described in claim 5 in which the lower end of the front wall extends to a lower plane than the lower surface of said flat portion whereby the agraffe is placed under tension when the agraffe is placed upon a flat surface and the flat portion is drawn tightly down.

In witness of the foregoing I affix my signature.

GUS E. HOLMBERG.

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