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K. S. GAGE
PORTABLE PIANO

2,494,700

Filed Sept. 19, 1946

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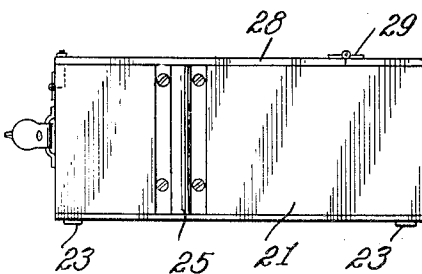
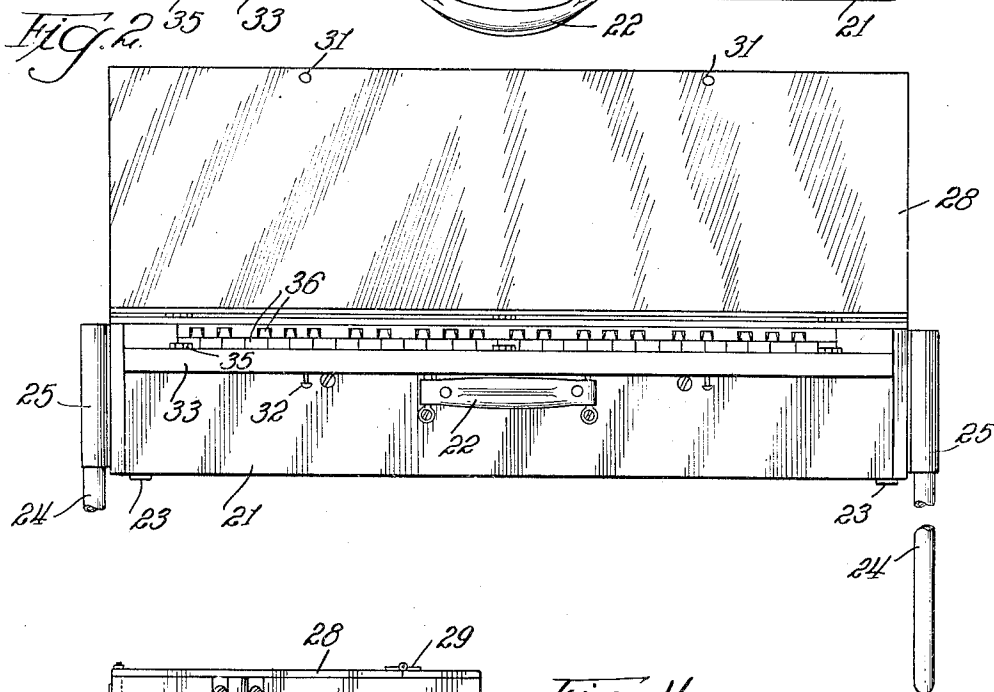
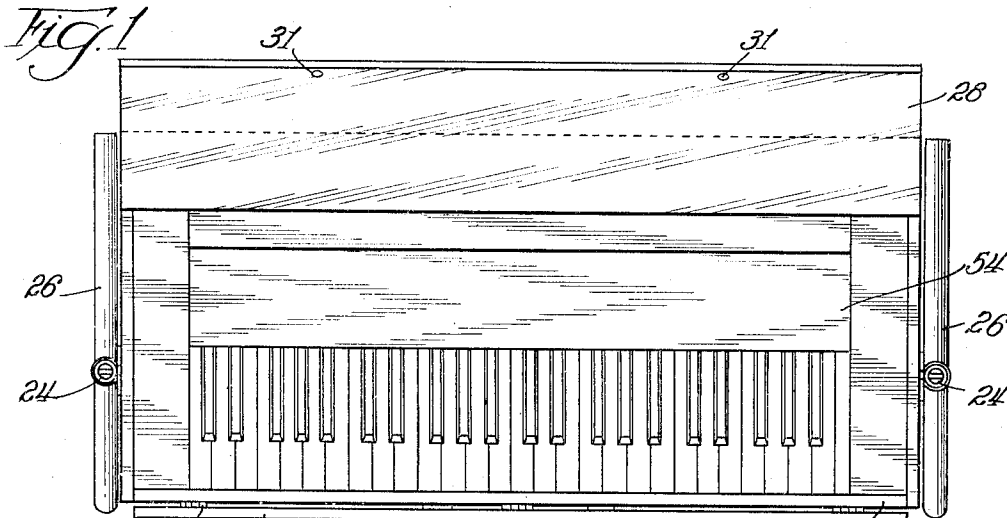


Fig. 4

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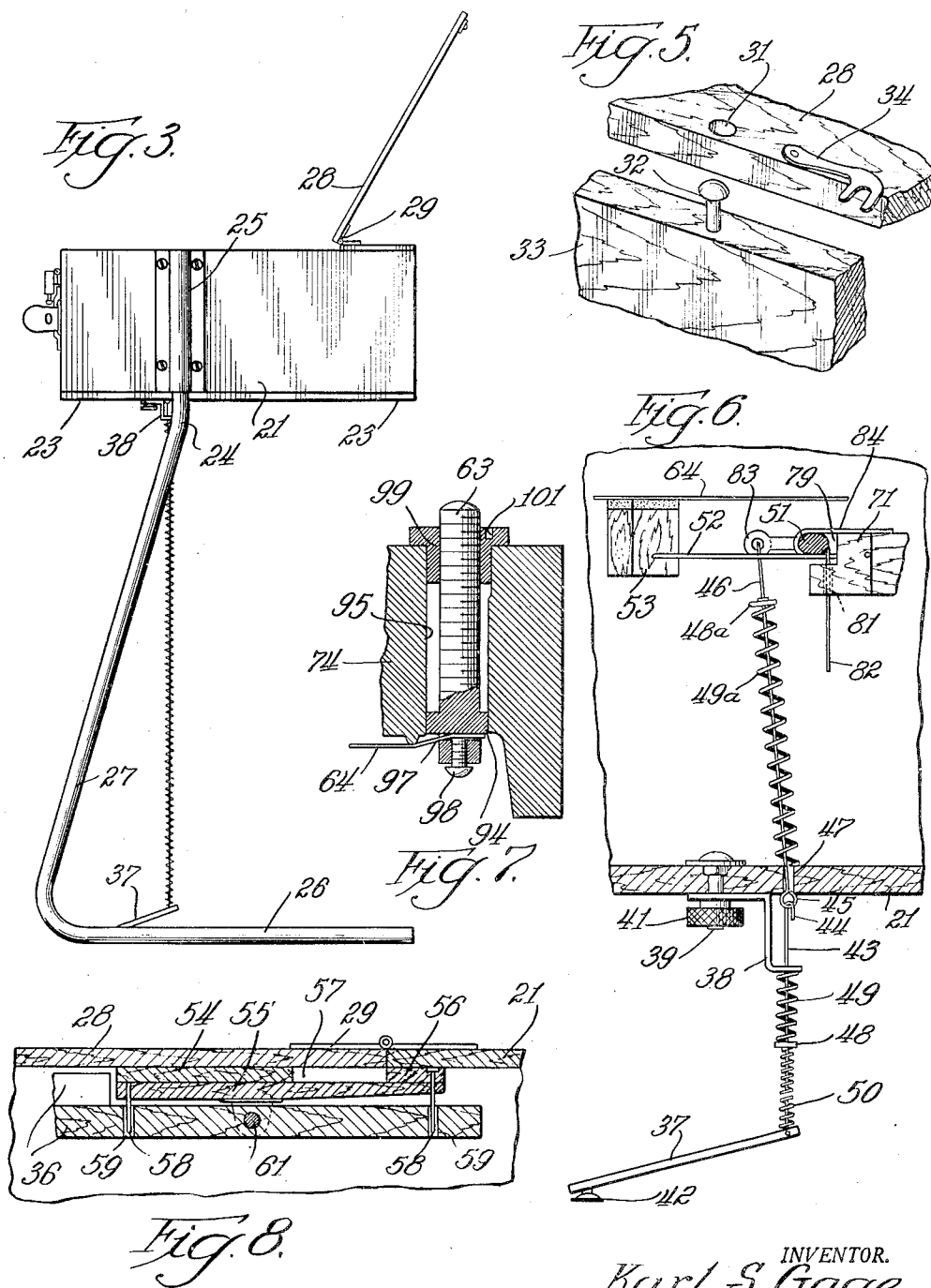
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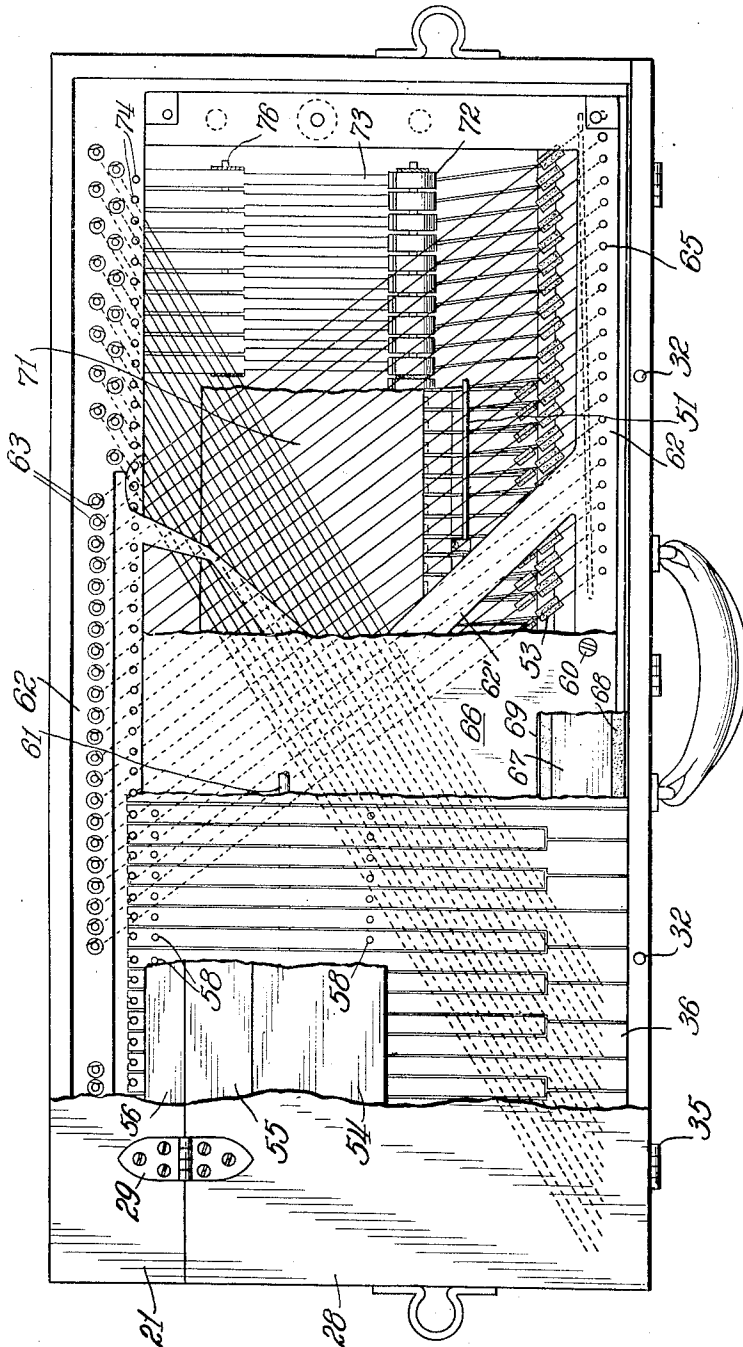
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Fig. 9.



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UNITED STATES PATENT OFFICE

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PORTABLE PIANO

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10 Claims. (Cl. 84—174)

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The present invention relates to a portable piano and more particularly to a compact portable piano which is readily carried from place to place as conveniently and readily as a suitcase or traveling case.

It has been found that there is a need for a portable piano to be used by students, teachers and others who travel and who need a piano for practicing. In the instance of students, it may be desirable to provide a relatively compact, economical portable piano so that classes of students may be taught at a time. On the other hand, teachers also at times have need for a portable piano so that instruction may be given in locations where the conventional piano is not available. It therefore would be highly desirable to provide an improved compact, economical portable piano.

It is therefore another object of the present invention to provide an improved compact portable piano which is readily enclosed in a case which may be carried by one hand, and which has detachable legs and pedals.

Another object of the present invention is to provide in a portable piano, an improved detachable pedal.

Still another object of the present invention is to provide in a portable piano, an improved economical, compact, simple piano action.

A still further object of the present invention is to provide in a portable piano, an improved arrangement of the means interconnecting the manual keys and the hammer action.

Other and further objects of the present invention subsequently will become apparent by reference to the following drawings:

Figure 1 is a plan view of a piano in position ready for use;

Figure 2 is a front view of the piano shown in Figure 1;

Figure 3 is an end view of the piano shown in Figure 1;

Figure 4 is an end view of the piano when closed and ready for transportation;

Figure 5 is a detailed view of a cover locking arrangement;

Figure 6 is a detailed view showing the pedal arrangement;

Figure 7 is a detailed view showing one of the tuning studs;

Figure 8 is a detailed view showing the supporting and guiding means for the manual keys;

Figure 9 is a plan view broken away in successive elevations to show the construction at different levels;

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Figure 10 is a cross-sectional view taken transversely of the piano to show the action at rest;

Figure 11 is another cross-sectional view similar to Figure 10 showing a manual key and associated action parts in note sounding positions; and

Figure 12 is another cross-sectional view similar to Figure 11 showing the positions of the same parts immediately following the sounding of a note.

By referring to Figures 1 to 4 of the drawings, it will be seen that in accordance with the present invention, there is provided a portable piano which is housed in a case 21 which is provided with a carrying handle 22 so that the piano may be carried when closed, as shown in Figure 4. A piano may be placed upon a table and accordingly the case may be provided with suitable legs or rests 23. The case may also be supported by suitable legs 24 which are inserted into sockets 25 which, in one embodiment, are mounted on the cheeks or sides of the case 21. The legs 24 preferably have a horizontal portion 26 which rests upon the floor or supporting surface and an angularly arranged portion 27 which extends between the portion 26 and the case 21.

The case 21 has a cover 28 which is provided with a suitable hinge 29 which may be of the type which limits the rearward movement of the cover 28 to substantially the angular relation illustrated in Figure 3. The cover 28, as may be seen from Figures 1, 2 and 5, is provided adjacent its forward edge with a plurality of apertures 31 arranged to cooperate with suitable headed studs 32 which are mounted in the drop panel 33. The cover 28 is further provided with a plurality of hooks 34 which are arranged to be moved into position beneath the head or heads of the studs 32 to lock the cover for transportation of the piano. The drop panel 33 is secured to the remaining portion of the cabinet 21 by a plurality of hinges 35. The panel 33 when dropped forwardly exposes for convenient use the manual keys 36 of the keyboard.

As may be seen from Figures 3 and 6, the assembled piano includes one or more pedals 37 detachably secured in position by a bracket 38. The bracket 38 has a bifurcated portion which is positioned adjacent a threaded stud 39 which is provided with a knurled nut or thumb screw 41. The pedal 37 may be provided with a suitable surface such as a suction cup 42 for retaining one extremity of the pedal in position. The other end of the pedal 37 is connected to a wire 43 which terminates in a hook 44. The hook 44 engages an

eye 45 formed at one end of a damper wire 46 which passes through a suitable aperture 47 in the bottom of the cabinet 21. The wire 43 between the pedal 37 and the bracket 38 may be provided with a collar 48, and a coiled spring 49 interposed between the collar and the bottom of the bracket holds the hook 44 and the eye 45 in proper engagement. The wire 43 between the collar 48 and the pedal 37 may be surrounded with a suitable conduit or coiled spring sheath 50 which serves to reinforce and guide the wire 43. The damper wire 46 passes through the bottom of the cabinet 21 through a suitable aperture 47. The damper wire 46 at an intermediate point carries a collar 48^a which engages one extremity of a spring 49^a which is interposed between the collar 48^a and the bottom of the case 21. The upper extremity of the damper wire 46 is connected to a damper rod 51 which extends longitudinally in the case 21 so as to engage the wire shanks 52 which support at their outer extremities the string dampers 53.

By referring to Figure 8, it will be seen that immediately beneath the cover 28 there is provided a longitudinally extending supporting member 54 which is connected to another longitudinally extending member 55 which in turn is connected to a longitudinally extending member 56. This latter member 56 is connected to the remaining upper portion of the case 21. The longitudinally extending recess 57 formed between the members 54 and 56 serves as a stop for the music resting on the cover 28 when it is in the position shown in Figure 3. The longitudinally extending member 55 is provided with a plurality of downwardly extending pins 58 which pass through suitable apertures 59 in each of the manual keys 36 to properly guide and position these keys. Each key 36 preferably is supported at an intermediate point between pins 58 on a suitable support such as a rod 61. The rod 61 is supported at each end by the housing 21 and at suitable intervals from the longitudinally extending member 55.

Further details of the construction of the present invention will become apparent from Figure 9, from which it will be seen that at the left side of the figure, the top of the case 21 together with the closed cover 28 is visible. Immediately to the right of the cover 28 there is seen the construction which provides a music rest stop when the cover 28 serves as part of a music rack. This construction includes the longitudinally extending members 54, 55 and 56. Just towards the front of the member 54 the manual keys 36 may be seen. To the right of the broken line terminating the transversely arranged members 54, 55 and 56, the manual keys 36 are shown to have the spaced apertures 58 and it further will be seen that each of the keys 36 is pivotally mounted on a suitably supported transversely arranged rod 61.

To the right of the portion just described, there is seen a frame 62 which extends longitudinally within the case 21 and which has an interconnecting X framework 62'. The frame 62 is suitably supported in the case 21 as by screws 70. The frame 62 carries the various strings 64 which extend between opposite sides of the frame 62. At the front edge of the frame 62 the ends of the strings are secured to suitable hitch-pins 65 and at the opposite side, each of the strings is connected to a tuning stud 63 which is shown in greater detail in Figure 7. Immediately above the frame 62 there is positioned a sound board 66 suitably secured in position, as by screws 60.

Adjacent the front edge of the sound board 66 there is mounted in spaced relation thereto a longitudinally extending support strip 67 which carries two resilient or felt strips 68 and 69. The resilient strip 68 is provided for the outer extremity of certain of the keys 36, whereas the other strip 69 is provided for the other keys 36 which correspond to the sharps and flats of the keyboard. To the right of the sound board 66 as formed by the broken line, there may be seen a longitudinally extending support member 71 which carries the dampers 53 and the damper bar 51. Right beneath the longitudinally extending member 71, there is positioned the remainder of the piano action which includes a plurality of butts 72 and a plurality of wippens 73 as well as certain other components illustrated in Figures 10 to 12.

Referring more particularly to Figure 10, it will be noted that the frame 62 along its rear edge is provided with the plurality of apertures 74 so that wire abstracts 75 may pass therethrough to interconnect the rear extremity of the keys 36 with wippens 73. The wippens 73 are pivotally mounted at 76 and supported from the transversely arranged support member 71 by a plurality of downwardly extending flanges 77. Each wippen is biased to a normal position by a looped spring 78 which has one extremity connected to the support member 71 and the other extremity connected to an intermediate point on the wippen 73. The support 71 adjacent its forward edge is provided with a step portion 79 and it is also illustrated in Figure 6. The upright surface of the step portion 79 carries the support wires 82 for the dampers 53. The horizontal surface of the step portion 79 is provided with a plurality of apertures 81 through which are passed damper connecting wires 82. The upper extremities of the damper connecting wires 82 are provided with hooks or eyes for engaging the damper supporting wire shanks 52. The damper connecting wire 82 extends downwardly and then rearwardly so as to engage the bottom side of the wippen 73 at an intermediate point. Immediately adjacent the eye portions of connecting wires 82 there is positioned a transversely arranged damper rod 51 which, as is apparent from Figure 6, is of elliptical or oval cross-section.

The rod 51 is arranged to be rotated by a suitable crank or lever 83. The rod 51 is retained in position by suitable fastening means or clips 84 mounted upon the top surface of the supporting member 71.

The forward portion of each wippen 73 carries a wire jack 85 having a stepped or hooked and preferably flattened portion 86 arranged to engage a generally horizontal surface on the butt 72. The jack 85 also has a vertical portion 87 which is arranged to be engaged by a vertical surface of the butt 74 as seen in the position shown in Figure 10, as subsequently will become apparent. Each butt 72 is provided with a hammer shank 88 which carries a hammer 89. The top surface of the hammer 89 may be provided with felt 91. The bottom of the hammer 89 is arranged to rest on a transversely arranged felt or resilient strip 92. From Figure 10 it is also evident that the transversely arranged supporting member 71 is supported from the frame 62 by a plurality of downwardly extending posts or support members 93.

From Figure 10 it is readily apparent that each of the strings 64 extends from a hitch-pin 65 to a tuning stud 63. The tuning stud 63, as may,

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be seen from Figure 7, has a threaded body portion terminating in a collar 94 which fits into a circular recess or aperture 95 and is prevented from turning therein by any suitable means. Immediately beyond the collar 94 the tuning stud 63 is provided with a transversely arranged aperture 97 which receives one extremity of the string 64 which is securely anchored in position in any desired manner as by a set screw 98. The position of the tuning stud 63 is determined by the adjustment of a nut 99 which is provided with a slot 101 so that the nut may be adjusted by a screw driver or key. In order to tighten the string 64, the nut 99 is adjusted so as to draw the tuning stud 63 upwardly. This arrangement of tuning stud permits relatively compact positioning of the studs as may be required in certain portions of the frame 62.

Each key being pivotally supported on the rod 61, as shown in Figure 11, when the forward or manual end is depressed, the rear end of the key moves upwardly. This moves upwardly the rear end of the wippen 73 by means of the abstract wire 75, so that the jack 85 has its horizontal portion 86 bearing against the generally horizontal cam surface 102 of the butt 72. After the butt 72 has been moved a predetermined distance, the vertical surface 103 of the butt engages the upper extremity 87 of the jack 85 so as to disengage the jack from further driving relation with the butt 72. Thus the final travel of the hammer 89 is brought about by the energy stored in the hammer and not by direct driving connection between the jack and the butt. At the time the forward end of the wippen 73 moves downwardly, the damper connecting wire 82 bends the damper supporting wire 52 so that the damper 53 is moved away from the string 64.

After the hammer 89 has struck the string 64, the hammer drops back to the position shown in Figure 12. As long as the manual key 36 is held in the position shown, the wippen 73 holds the damper 53 away from the string 64 so as to sustain the tone of the note struck.

In the previous Figures 10 and 11, no mention is made of any actuation of the pedal 37 and hence the member 51 would be in a neutral position. If, however, the pedal were actuated, member 51 would be moved to the position shown in Figure 12, thereby to move all damper supporting wires 52 to the position shown in Figure 12 so that all notes struck at that time, as in a chord, would be sustained. As long as the pedal is actuated such notes would be sustained even though other notes subsequently are played. Thus the pedal provides convenient tone sustaining action or effect.

Although for the purpose of illustrating and describing the present invention, a preferred embodiment has been shown in the drawings, it is to be understood that the invention is not to be limited thereby since such variations in the instrumentalities employed and in their arrangement are contemplated as may be commensurate with the spirit and scope of the invention set forth in the following claims.

I claim:

1. The combination, in a portable piano, comprising a casing having a frame supporting piano strings, dampers for said strings, a bar for said dampers, a pull wire extending from said bar to the exterior of said casing, a spring interposed between said casing and a point on said wire, a detachable pedal having a wire adapted to be connected to said damper pull wire, and

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a detachable guide for said pedal wire mounted on the exterior of said casing.

2. A portable piano having a casing containing a keyboard, a sound board extending beneath said keyboard, a plate supporting said sound board, a plurality of strings supported beneath said sound board upon said plate, a piano action mounted beneath said plate and strings, and means operatively connecting the keys of said keyboard with said action.

3. A portable piano having a casing containing a keyboard, a sound board extending in a substantially horizontal plane beneath said keyboard, a plate supporting said sound board, a plurality of strings supported beneath said sound board upon said plate, a piano action mounted beneath said plate and acting upon said strings, and a plurality of abstract wires passing through the rear portion of said plate and interconnecting the keys of said keyboard with said action.

4. A portable piano having a rectangular casing, a generally rectangular plate mounted within said casing, a sound board mounted upon said plate, a plurality of manual keys mounted in said casing above said plate and sound board, a plurality of strings supported beneath said sound board upon said plate, a piano action comprising a plurality of hammers, jacks and wippens mounted beneath said plate, the hammers of said piano action acting upon said strings, and a plurality of abstract wires passing through said plate and interconnecting the wippens of said action with the said manual keys.

5. A portable piano having a rectangular casing, a generally rectangular plate mounted within said casing, a sound board mounted on said plate, a plurality of manual keys mounted above said plate, a plurality of dampers and wippens mounted beneath said plate, a plurality of abstract wires passing through said plate and interconnecting the wippens with the manual keys, and a detachable pedal adapted to actuate said dampers.

6. A portable piano having a rectangular casing, a plate mounted therein, a sound board mounted on said plate, a plurality of strings mounted on said plate, a plurality of manual keys positioned above said plate, a plurality of dampers and wippens mounted beneath said plate, a plurality of abstract wires passing through said plate to the rear of said sound board and interconnecting the wippens with the manual keys, and a detachable pedal adapted to be connected to the exterior of said casing for actuating said dampers.

7. In a portable piano, the combination comprising a horizontal frame, a plurality of strings mounted thereon, a plurality of wippens mounted beneath said strings, each wippen having a hooked jack, and a pivoted butt connected to a hammer, said butt having a surface in engagement with said jack for a predetermined portion of the movement of said wippen.

8. In a portable piano, the combination of a horizontal frame having a plurality of strings thereon, a plurality of wippens positioned beneath said strings, each wippen having a jack, a pivoted butt connected to a hammer for each wippen, said butt having a cam surface in engagement with said jack for a predetermined portion of the actuation of said wippen, and a surface on said butt for disengaging said jack from said first surface for the remaining portion of the actuation of said butt.

9. In a portable piano, the combination com-

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prising a horizontal frame, a plurality of strings thereon, a plurality of wippens mounted beneath said strings, each wippen having a jack, a damper arranged to be actuated by said wippen, a pivoted butt for cooperation with said jack, said butt having a surface normally in contact with said jack so as to be actuated thereby when said wippen is actuated and an adjacent surface for disengaging said jack from said first surface whenever said butt has been turned a predetermined amount to provide a subsequent free movement of said butt.

10. In a portable piano, the combination comprising a frame having a plurality of strings thereon, a plurality of butts and wippens, a plurality of hammers connected by a shank to said butts, each wippen being provided at its free end with a wire jack having a hooked portion, each butt having a recessed surface normally in contact with a hooked portion of said jack so as to be

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actuated thereby whenever said wippen is actuated and having an adjacent surface for disengaging the hooked portion of the jack from said first surface whenever the butt has been turned a predetermined amount thereby to cause the energy stored in said hammer to move said hammer freely toward and away from said strings.

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