

UNITED STATES PATENT OFFICE.

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ACTION OF PIANOFORTES AND MODE OF GIVING STABILITY TO SUCH INSTRUMENTS.

Specification of Letters Patent No. 504, dated December 7, 1837.

To all whom it may concern:

Be it known that I, THOMAS LOUD, of the city of Philadelphia, in the State of Pennsylvania, have invented certain improvements in pianofortes, which improvements consist, first, in what I denominate "the front-motion grand action, with front regulation;" second, in "the back-motion grand action, with front regulation;" third, in "the metallic supporting-brace in tuning-pins or long blocks," and, fourth, in "the detached metallic plate," of which several improvements in the action and in the mode of giving stability to the instrument under the great degree of tension to which it is subjected, and consequently causing it to keep in tune more perfectly than ordinary, I do hereby declare that the following is a full and exact description.

In the accompanying drawing, Figure 1, represents "the front motion grand action, with the front regulation," the respective parts of which are pointed out by the following numerals.

References to Fig. 1: 1, the key; 2, the jack or grasshopper, attached to the key and that lifts the hammer when the key is struck; the front upper part moved, while the back standard is permanent; 3, the regulating screw, with nuts on the screw; 4, the hammer block, to which is attached the hammer shank and hammer head which strikes the strings; 5, the center of hammer block; 6, the capsule, in which the center of the hammer moves; 7, the string; 8, the check, to catch the hammer head after it has struck the string; 9, the spring of the jack.

My improvement in the "front motion grand action with front regulation," consists in the applying the jack or grasshopper (which lifts the hammer and is attached to the key) at once to the block of the hammer, without the use of the "second" or "under hammer," the jack having a front motion; that is to say, the movable part of the jack, after it has taken the hammer to the string, passes, or relieves from it, by a front motion and toward the center of the hammer, instead of passing back, and away from the center of the hammer, which is the common mode in grand actions, and also in the method of regulation of the jack, which is arranged with the regulating screw passing from the front through a loose hole in its movable part, and screwed into the permanent standard at the back; the regulating

screw has two nuts on it, one front and one back of the movable part of the jack. The spring of the jack keeps it firmly against the hammer block, and by screwing the regulating screw, in or out, the nut at the back of the movable part of the jack is made to force forward the front of jack, so as to pass or relieve it off from the hammer block, at the exact point of the hammer head's touching the string. The nut in front of the movable part of the jack is placed at a distance from it, say, of one fourth of an inch, and is used as a guard to prevent the point of the jack flying off too far from the hammer block when a severe blow is struck—the regulation of the jack is from the front, and it can therefore be regulated when the action is in its place in the instrument—as in the ordinary jack of the English action where the under hammer is used. The operations and movements as well as method of regulation of my front motion grand action with front regulation is fully exemplified in the drawing with the numerals referring thereto. The improvement claimed and wished to be secured by Letters Patent, in this modification of the action, is—

The application of the jack or grasshopper immediately to the hammer block, with a front motion, or toward the center of the hammer; together with the front regulation of the jack or grasshopper, when the jack is thus applied at once to the hammer block.

Fig. 2, shows the manner in which I effect my second improvement in the action, denominated by me "the back motion grand action, with front regulation." The back motion grand action, as usually made, is regulated by taking the action out of the instrument, and turning the regulating pins, or screws, which are placed perpendicularly over the projecting arm of the jack which is a part of it; the screw and arm are not in sight, and are not capable of being regulated from the front. The following references and description will fully exemplify the points of difference between this back action, and that which I have invented.

References to Fig. 2: 1, the key; 2, the jack, or grasshopper attached to the key, that thus the hammer upon the key is struck; 3, the relieving lever; 4, the regulating screw, with double nuts to prevent play in the relieving lever; 5, the nuts screwed on the regulating screw; 6, the hammer block attached to the hammer shank and

hammer head which strikes the string; 7, the center of hammer block; 8, the capsule, in which the center of the hammer moves; 9, the string; 10, the check, to catch the hammer head after it has struck the string; 11, the permanent rail, (clothed) against which the relieving lever strikes, in its motion in taking the hammer to the string; 12, the spring of jack.

10 My improvement in the "back motion grand action, with front regulation," consists in attaching to the front or movable part of the jack or grasshopper, that strikes the hammer block, an additional movable lever, called a "relieving lever" with an arm or projection (which is at right angles from its center) passing under a clothed permanent rail, it is attached to the front of the jack by a regulating screw passing through a loose hole in front of jack, and screwed into the relieving lever from the front. The relieving lever is kept firm to the front of the jack by two nuts screwed on to the regulating screw, one front and one back of the front of jack. The regulating screw, by screwing in or out, regulates the point at which the hammer is permitted to fall, by raising or depressing the back arm of the relieving lever, which passes under the clothed permanent rail, so that as the key rises, the jack is struck off from the hammer, sooner or later, as may be necessary. Another important improvement in the use of the relieving lever, is, that the jack, by this arrangement, is regulated from the front of the instrument, when the action is in its place in the pianoforte, this action is called "back motion grand action" because, when the movable part of the jack has taken the hammer to the string, it passes or relieves from the hammer by a back motion, or from the center of the hammer. Its operations and movements as well as the method of regulating it are fully exemplified in the above named drawing, Fig. 2, with the references thereto. The improvement claimed in this modification of the action and wished to be secured by Letters Patent, is—

50 The "relieving lever" of the jack, in the back motion grand action of a piano forte; which relieving lever, either centered in the front part of the jack, or not, is attached to the front or movable part of the jack, by the regulating screw and its nuts; 55 and also, the regulating screw, which is moved or regulated from the front of the instrument, when the action is in its situation in the piano forte.

60 Fig. 3. represents what I denominate the "metallic supporting brace" as inserted in the tuning pin, or long block, of a piano forte, and the manner in which it is connected with the other parts of the instrument.

65 Reference to Fig. 3: 1, the metallic supporting brace; 2, the tuning pin, or long

block, to which the metallic supporting brace is attached; 3, the points of support to the points of tubes or braces, or metallic plate, and made usually with a projecting part in the casting let in, down the front of the block, and fastened with a screw; 4, projecting part of the casting, made in notches, and let in and screwed to the front of long block, to secure the lowest point of support; 5, tuning pins in long block to which the strings are attached; 6, bridge on long block, upon which the string rests, and form the vibrating point; 7, metallic plate, to which the end of string is fastened; 8, braces or tubes for supporting the metallic plate.

My metallic brace as applied to piano fortes consists of a band of metal (usually cast iron) of about three eighths of an inch in thickness, and varying from three fourths of an inch, to two and a half inches in width, which is inserted into the long, or tuning pin, block; there being projecting parts of the casting, which pass down, and are let into the front part of the block, and are firmly screwed to it, at the several points of support, either between the tuning pins and the bridge on said block, or on the outer side of the tuning pins, following the whole, or part of the whole line of tuning pins, and against which the treble end of the detached metallic plate, to be presently described, as well as the brace, or braces, that support the metallic plate, is attached or supported; and also against which, in my patent compensation tube piano fortes, one end of each tube is attached, inserted, or supported. For a description of which compensation tubes I refer to the Letters Patent of the United States granted to me therefor. The great value of this supporting brace, is its giving an unchangeable support to the various points that support the metallic plate to which the ends of the strings are attached, and in taking the strain arising from the tension of the strings off from the case, or wooden part of the piano forte.

What I claim as my improvement, and wish to have secured by Letters Patent, in what I denominate my metallic supporting brace, is—

The inserting, or attaching of a continuous metallic band or brace, called the "metallic supporting brace" in the tuning pins, or long block, of piano fortes, to form supports to the metallic plate, by braces, tubes, or otherwise for more than one point of its strain, the said supporting brace being continuous, either in one or more pieces, and being placed in, or attached to, the tuning pin or long block to receive the strain from the metallic plate arising from the tension of the springs, either by its touching the plate, or by braces or tubes attached to it, in the manner, or upon the principle herein fully made known.

Fig. 4. shows my fourth improvement, consisting of the "detached metallic plate," together with its connection and combination with the other parts of the instrument.

- References to Fig. 4: 1, the front of the instrument; 2, the back of the instrument; 3, the long, or rest pin block; 4, the detached metallic plate; 5, the places where the screws are inserted, to hold the plate level; 6, the wooden pin, upon which the plate rests; 7, a projecting piece of the casting on the under side of plate, at the place of attachment at the treble or back of the instrument, to the long, or rest pin block; 8, a projecting piece of casting on the upper side of plate, at the place of attachment at the bass or front of instrument, to the wooden brace; 9, the attachment at the projecting bend of plate, to the metal brace; 10, casting inserted in the under side of wooden brace, to meet the projection on the plate at 8; 11, the end of case, or instrument; 12, the wooden brace; 13, the metallic brace; 14 the metallic supporting brace.
- My improvement denominated "the detached metallic plate" consists in the plate (which in my instruments is of cast iron) being detached (except at the two ends of the plate) from the back and end of the piano forte case instead of filling the corner as is commonly done; its inner edge following the line of the pins to which the strings are fastened on the plate on the outer edge, forming a band of the required shape, varying in width from three to eight inches, thereby reducing the quantity of metal, and exposing more of the sound board.

The detached metallic plate is screwed at the two ends to the pin blocks, to which the sound board is fastened, to preserve its level with the bridges, and it also rests upon a wooden pin (inserted in the bottom of the instrument) in the bend near the center of the plate; the strain of the strings is supported by attaching it at the treble or back of the instrument, against the tuning pin, or long block, or castings, inserted in the block, and at the bass, or front part of instrument, against the wooden brace, or a metal casting inserted in it,—and in the center of plate, by one or more metal braces, with or without hardened steel points; which braces rest against the plate, and against my metallic supporting brace, inserted in the tuning or rest pin block, but without any side or lateral supports.

The great value of the detached metallic plate, consists in the reduction of the metal in width, to a narrow band, instead of filling up the corner of the instrument, and thereby avoiding the contraction and expansion of the large plate, which is always against the string.

The improvement claimed and wished to be secured by Letters Patent, in the detached metallic plate, is—

The detaching the plate from the back and end of the case, except at the ends of plate, where it is screwed to keep it level.

THOMAS LOUD.

Witnesses:

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