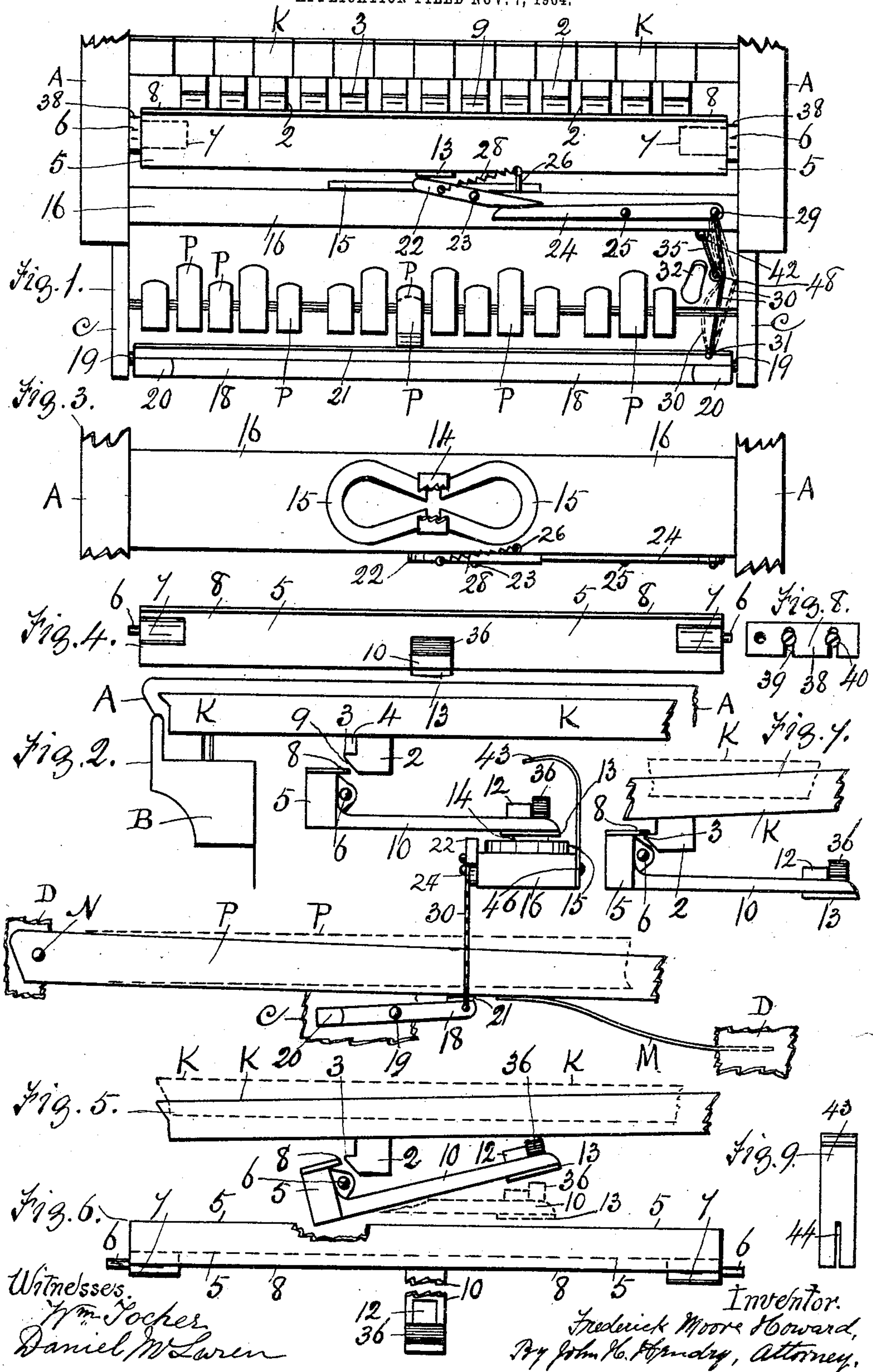


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F. M. HOWARD.
ORGAN AND PIANO.

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UNITED STATES PATENT OFFICE.

FREDERICK MOORE HOWARD, OF HAMILTON, CANADA.

ORGAN AND PIANO.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, FREDERICK MOORE HOWARD, a citizen of Canada, and a resident of Hamilton, in the county of Wentworth and Province of Ontario, Canada, have invented new and useful Improvements in Organs and Pianos, of which the following is a specification.

My invention relates to improvements in organs and pianos in which certain mechanism connecting the manual-keys and the pedal-keys is arranged and devised to retain one or more notes or chords until released by the playing of another note or chord or by operating one or more pedal-keys.

The objects of my invention are, first, to provide means for detaining one or more manual-keys in depressed position while one or both hands are engaged in playing other parts of a composition on another manual; second, to allow freedom of movement of the different parts of a composition; third, to allow more freedom in the choice and use of stops; fourth, to obtain the effect of the sostenuto-pedal of a piano and to make piano arrangements of compositions more readily adapted to the organ; fifth, to afford facilities for freeing the hands of the organist during the playing of a composition for the purpose of operating stops, turning music-sheets, and performing other essential movements with ease; sixth, to afford facilities for playing together as many distinct parts as there are manuals of the organ, each with a different quality of tone; seventh, to obtain better results from organ students while practicing legato-pedal studies by retaining one or more notes on a manual, which would be released if the pedal-playing were not strictly legato; eighth, to apply the device to piano-actions to make large chords and octaves legato without the constant changing of the pedals required by the use of the sustaining-pedal of the piano; ninth, to sustain the bass notes of a composition on a piano without sustaining others at the same time; tenth, to attain additional functions from the playing of the pedal-keys without additional motion.

The objects of my invention are obtained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the manual or keyboard of an organ, the ordinary pin-rail being removed to show more fully the operating mechanism in rear of said pin-rail,

the distance between the keyboard and the pedal-keys being reduced. Fig. 2 is a side elevation of the operating mechanism, showing a pedal-key depressed, also broken lines of the same as it would appear when not depressed and as viewed from the right-hand side of the keyboard, the distance between the manual-keys and the pedal-keys being similar to and conforming with Fig. 1 of the drawings. Fig. 3 is a detail plan of the stationary supporting-board for the magnetically-charged steel bars and operating-levers pivoted to the front of the board. Fig. 4 is a detail elevation of the key-retaining bar as viewed from the rear of the organ. Fig. 5 is a detail side elevation of a manual-key partially depressed, showing the block on the underneath side of the key passing the metal lip on the key-retaining bar and in consequence elevating the tongue of said bar obliquely. The broken horizontal lines show the position of said key previous to its being depressed. Fig. 6 is a detail plan of the retaining-bar, the central tongue of which is shown broken. Fig. 7 is a detail side elevation of a manual-key depressed to its full extent and locked to the key-retaining bar, the broken horizontal line showing the position of the manual-key previous to its being depressed, as in Figs. 1 and 2. Fig. 8 is a detail end elevation of the adjustable bracket-bearing for the end pivots of the retaining-bar. Fig. 9 is a detail front elevation of the adjustable regulator for tongue motion.

Similar characters of reference refer to similar parts throughout the several views.

In the drawings the walls of the manual-keyboard of the organ are indicated by A, the pin-rail or front part of the organ by B, and the sides or frame of the pedal-keys by C. The above-indicated parts of the organ, together with the manual-keys K and the pedal-keys P, of desirable number and form, and other parts D of the organ, are not new, and therefore do not constitute a part of this invention.

On the under side of the manual-keys K and near to the front thereof are blocks 2, rigidly secured to said manual-keys. The front part of the blocks 2 have frontwardly-projecting lips 3, forming recesses 4 between the lips and the under side of the manual-keys. The points 3 of the lips are slightly rounded and continue backward obliquely, as at 9, to the bottom of the blocks. As

many manual-keys K as are desirable may be supplied with blocks 2. A key-retaining bar 5 is located immediately below the lips 3 on the blocks 2 and in front of the blocks 2 and extends from wall A to the opposite wall A of the manual-keyboard and is pivotally connected thereto by means of its end pivots 6, which extend more or less into the bracket-bearings adjustably connected to the walls A. 7 represents strengthening-pieces on the rear part of said bar 5 to strengthen and support the pivots. On the upper part of the bar 5 is secured a metal strip, which extends the length of the bar and projects rearwardly over the bar to form a continuous lip 8, extending the full extent of the manual-keys. The key-retaining bar 5 has a centrally-located and rearwardly-extending tongue 10, with upper weight 12, in order to give more weight to the rear part of the bar 5—that is, to the rear of its pivots 6—than to the forward part of the bar in front of said pivots and to give the retaining-bar an impetus when released from the magnetism. The tongue also affords increased leverage to the retaining-bar and controls the motion of the bar. The lower part of the tongue 10 has a soft-iron pad 13, which the magnetically-charged steel bars engage through a layer of felt 14, the felt to prevent absolute contact of the soft-iron pad 13 and the said bars.

The steel bars may be charged electromagnetically or artificially, as desired. The magnetically-charged steel bars 15 are attached to and supported by the rest-bar 16, which is supported by the walls A of the manual-keys.

Immediately below the pedal-keys of the organ is a bar 18, pivotally connected at 19 to the frame C of the pedal-keys and is adapted to oscillate by the depression of any one or more pedal-keys P. The pedal-keys P are pivotally connected at N to the front part of the pedal-frame, as at D, in the usual manner. The front end parts of the bar 18 are supplied with suitable weights 20 in order that the front part of said bar shall have a tendency to fall by gravity to a lower position than the rear part of said bar to keep the rear of said bar in contact with the pedal-keys. The upper and rear part of the bar 18 has a strip of felt material 21, forming a part thereof, to avoid any noise when the pedal-keys are depressed by the organist.

The rear parts of the pedal-keys P are supplied with suitable springs M, connected to the organ, as at D, in the usual manner to give an upward pressure to the rear part of the pedal-keys and bring the same after depression to normal position in the usual manner.

22 is a lever fulcrumed at 23 to the front side or edge of the rest for the steel bars 15. Another lever 24 is fulcrumed at 25 and extends under lever 22. The rear end of the lever 22 and the front end of the lever 24 are

adapted to engage each and to operate each other on the respective fulcrums. 26 is a pillar on the upper side of the said rest 16, and a spiral spring 28 connects the pillar 26 and the lever 22 in front of the fulcrum 23. The function of the spring 28 is to pull the front part of the lever 22 upward that the front and upper part of the lever may engage the tongue 10 of the bar 5. The rear end of the lever 24 is pivotally connected to the upper end part of the connecting rod or cord 30 at 29, and the lower end of said cord 30 is connected to the end part of the pivotal bar 18 at 31. The connecting-rod 30 is preferably made of flexible material and passes in close proximity to the swell-box foot-plate 32. (Shown in Fig. 1 of the drawings.) Said foot-plate of the swell-box is not new. A roller 48 is connected to the lower end of a rod 35 to engage the cord 30.

Considering that the key-retaining bar 5 is made of light material, it is therefore very sensitive to the touch of the lower part of the oblique part of the blocks 2 on the strip 8.

The function of the magnetically-charged steel bars 15 is to draw to and retain the tongue 10, consequently retaining the bar 5 in position.

In Fig. 8 of the drawings is shown the adjustable bracket-bearing 38 for support of the retaining-bar 5, with slots 39 and screws 40 to adjust and tighten said bearings to the walls A.

The rounded lips 3 of the blocks 2 are free from friction and wear when the manual-keys K are being depressed, because the tongue 10 is brought upward with impetus by the oblique part 9 of the blocks 2 engaging the lip 8.

When the tongue 10 is suddenly released from the influence of the magnetism, it rises with impetus, allowing the lips 3 on the blocks 2 to pass the lip 8 on the retaining-bar 5 without friction.

43 is a tongue-motion regulator on the rear side of the rest 16 and has a slot 44 to allow vertical adjustment of the same and is secured to said rest 16 by means of a screw 46.

The operation of my invention is as follows: When one or more manual-keys K begin to descend, the blocks 2 press obliquely on the retaining-bar 5. This pressure breaks the soft iron on the rear end of the tongue from the tension of the magnetism. When the tongue 10 has risen from the influence of the magnetism, it ascends with impetus. The retaining-bar and tongue being rigidly connected oscillate on the pivotal ends of the retaining-bar with the impetus given as above described. When the retaining-bar is oscillating with the above-mentioned impetus and the keys are descending by the pressure of the fingers, the lip 3 on the block descends below the lip 8 of the retaining-bar without further friction of the lips. The felt 36 on

the top of the tongue 10 comes in contact with the regulator 43, causing the bar and tongue to rebound and return by gravitation to the original position. The soft iron on the rear end of the tongue again comes into the influence of the magnetism, and the manual-keys depressed by the organist become locked in their depressed position by the engaging of the lips 3 and 8. When the fingers are removed from the manual-keys, said keys remain in depressed position until other manual-keys are depressed, when the retaining-bar again oscillates with impetus and releases the keys previously retained. As the first-depressed manual-keys are released the second-played manual-keys are acted upon in a similar manner to the first. Hence the movement of the retaining-bar is acted upon by magnetism, impetus, rebound, and gravitation.

The operation previously referred to is controlled by the pedal-keys in the following manner: When the pedal-keys P are not depressed, the retaining-bar 5 is kept out of action by a spring 28, attached to the lever 22, which raises the tongue 10. When the rod 35 is normal and one of the pedal-keys depressed, as shown in Fig. 1 of the drawings, the lever 22 is also normal. When the rod 35 is moved by the foot toward the left-hand side, the depression of a pedal-key takes up the slack in the cord 30 without bringing the retaining-bar into operative position. When the rod 35 is moved by the foot toward the right-hand side, the lever 22 is removed from proximity to the tongue 10.

The pedal-keys P are located below the manual-keys in the usual manner and are for the purpose of playing bass parts of a composition and for controlling the operation of the bar 5 by means of the bar 18, which is connected to the levers 22 and 24 by the cord 30.

There are two ways of retaining the keys in depressed position when depressed by the hand—by the depression of the pedal-keys and by means of the foot-pressing rod 35. There are also two ways of releasing depressed manual-keys—by depressing other manual-

keys, by releasing depressed pedal-keys, and by relaxing the connecting-cord 30.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an organ, a horizontal bar adapted to oscillate therein, an extending lip on the bar, manual-keys, beveled lips on the manual-keys, a tongue on the bar, an armature carried by the tongue, magnets underneath the said armature, and means for throwing and rebounding the said tongue.

2. In an organ, pedal-keys, a bar having pivotal connection with the pedal-frame and in contact with pedals, a retaining-bar parallel therewith and adapted to oscillate, and means to operate said bars by the said pedal-keys.

3. In an organ, a stationary bar, magnets on the bar, an armature above the magnets, a lever pivoted to the stationary bar, pedal-keys below said bar, an oscillating bar below the pedal-keys, and means connecting said lever to the said oscillating bar.

4. In an organ, a stationary bar, a magnet on the bar, a key-retaining bar adapted to oscillate, a tongue projecting therefrom, an armature on the tongue, a stop for the tongue, and means on the tongue to engage the tongue-stop.

5. In an organ, pedal-keys, a horizontal bar adapted to oscillate near the pedal-keys, a stationary bar above the pedal-keys, a lever pivoted to the stationary bar and a cord connecting said lever and oscillating bar.

6. In an organ, manual-keys, blocks with lips on the manual-keys, an oscillating bar, a lip on the bar and magnets to hold the bar.

7. In an organ, manual-keys, beveled blocks with lips on the manual-keys, a retaining-bar adapted to oscillate, a lip on the bar, the beveled blocks to engage said lip, a tongue on the bar, an armature on the tongue, a stationary bar, a magnet on the bar, and a tongue-motion regulator on the stationary bar.

FREDERICK MOORE HOWARD.

Witnesses:

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