

(No Model.)

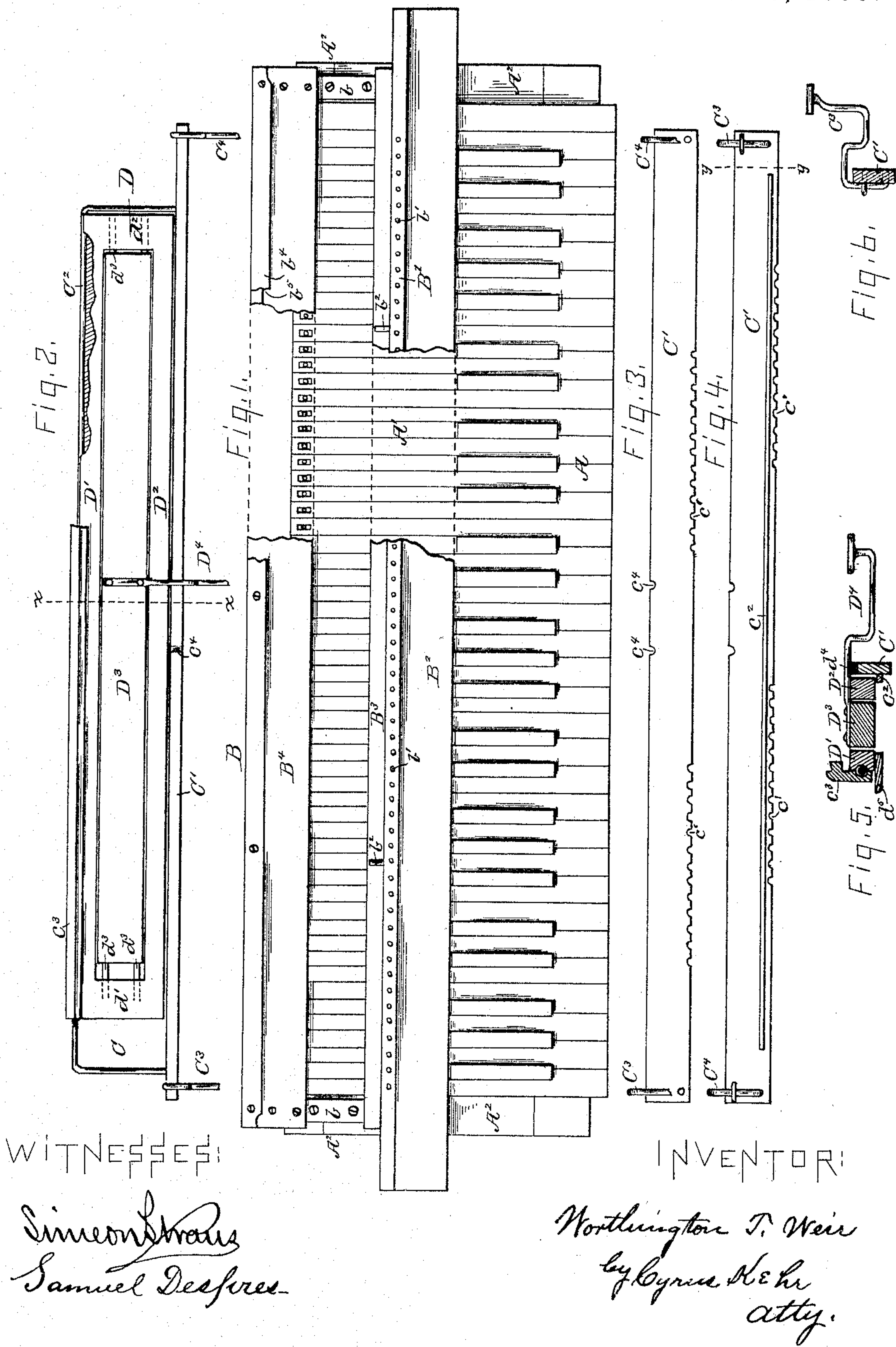
2 Sheets—Sheet 1.

W. T. WEIR.

KEY BOARD FOR MUSICAL INSTRUMENTS.

No. 352,965.

Patented Nov. 23, 1886.



WITNESSES:

Siméon Kraus
Samuel Despres

Samuel Despres.

INVENTOR:

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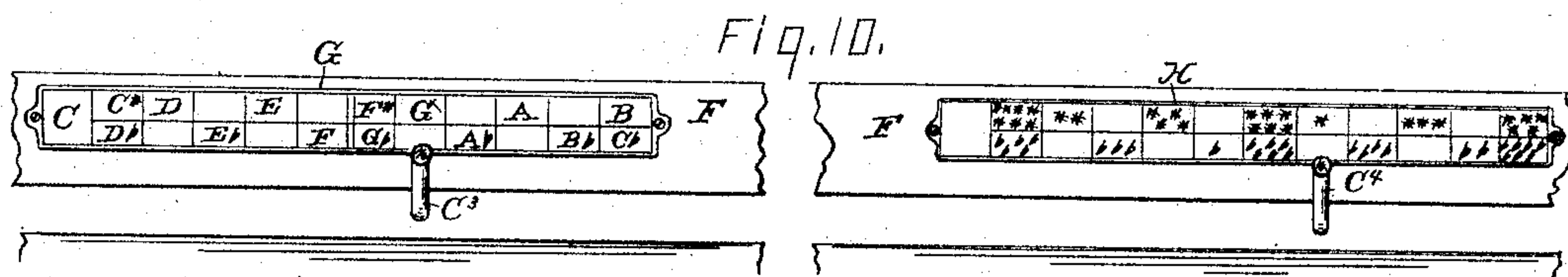
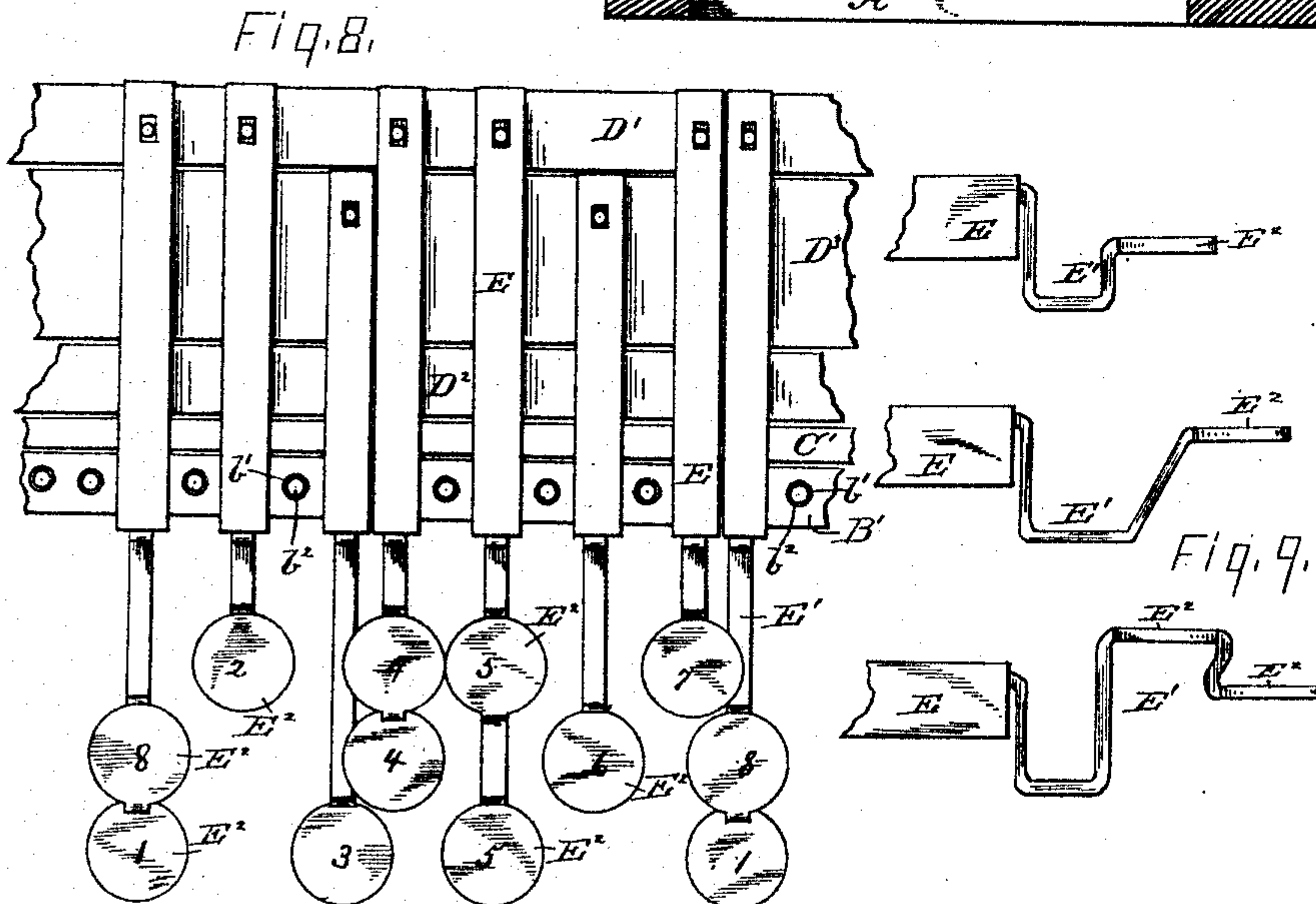
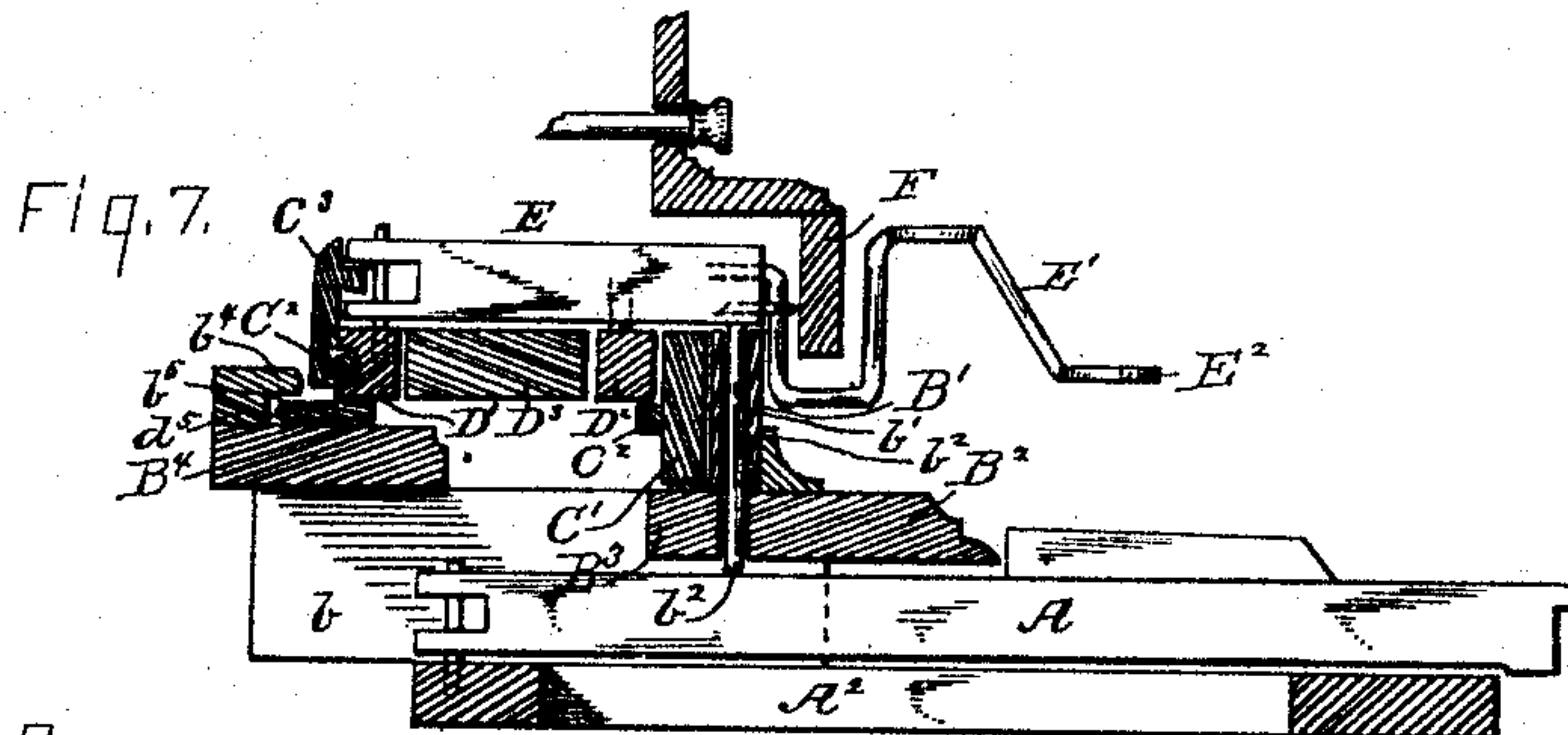
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UNITED STATES PATENT OFFICE.

WORTHINGTON T. WEIR, OF CHICAGO, ILLINOIS.

KEY-BOARD FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 352,965, dated November 23, 1886.

Application filed May 7, 1885. Serial No. 164,712. (No model.)

To all whom it may concern:

Be it known that I, WORTHINGTON T. WEIR, a citizen of the United States, late of Spring Hill, Illinois, and now residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Key-Boards for Musical Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to organ and piano key-boards in which the keys are divided or arranged in three harmonic divisions or rows, and in which provision is also made for mechanically transposing the music being played, in order to enable the player to more readily play the music; and the devices herein described relate more particularly to improvements and modifications of the devices described in an application for patent for an improvement in key-boards for musical instruments filed by me October 3, 1884, bearing the serial number 144,669, and allowed April 20, 1885.

The invention consists in the matters hereinafter set forth, and particularly pointed out in the appended claims.

In the accompanying drawings, Figure 1 is a view of the ordinary key-board of an organ with the stop-action removed, and a part of my key-board in place thereon. Fig. 2 shows a part of the key-board proper and a frame in which it rests. Figs. 3 and 4 are detail views of the frame shown in Fig. 2. Fig. 5 is a section in line *xx* of Fig. 2. Fig. 6 is a section in line *yy* of Fig. 4. Fig. 7 is a transverse vertical section of the fixed and movable key-boards. Fig. 8 is a fragmentary plan showing one octave of keys in place. Fig. 9 shows finger-pieces for the keys. Fig. 10 shows a compound indicator by which to determine the position of the board.

For convenience in description I use herein the terms "harmonic divisions" and "tonic," "sub-dominant," and "dominant harmonies." The term "tonic harmony" designates collectively all the notes constituting

the chords or triads of the tonic in the several octaves of the musical scale. The term "sub-dominant harmony" designates collectively all the notes constituting the chords or triads of the sub-dominant in the several octaves. The term "dominant harmony" designates collectively all the notes constituting the chords of the dominant seventh in the several octaves, and the term "harmonic divisions" designates collectively the three harmonies above named. I also use the term "half-step," by which I mean a space equal to the width of one key in the ordinary chromatic board of the organ.

By reference to the drawings it will be seen that the ordinary key-board is left in its usual position, while my harmonic board is located just to the rear of and over the ordinary board, thus leaving the latter entirely free and unobstructed, while the harmonic board is also always in proper position for use, so that the player may use either board at will.

In all organs the ordinary chromatic key-board (marked A in the drawings) presents an even level upper surface, A', just back of the black keys. Upon this even surface I place my harmonic board permanently.

The frame B (shown in Fig. 1) is fastened by the blocks *b* upon the ends of the frame A², supporting the keys of the ordinary board, A, or otherwise.

B' is a board or bar extending from one block *b* to the other, and provided with a series of vertical holes, *b'*, one over each key of the board A, in which rest loose vertical shafts or pegs *b*². Each of these pegs rests with its lower end on a key in the board A, and its upper end projects a little above the upper surface of the bar B'.

B² is a board lying in front of the peg-bar B' and extending forward to the ivory and ebony of the board A. Such board B² may also extend beneath the peg-bar B', and be perforated by extending the holes *b'* downward. The drawings also show said board B² extending back of the peg-bar B' to form a ledge, B³.

B⁴ is a board placed a few inches back of and parallel to the ledge B³, and extending from one block *b* to the other. Upon the rear part of the board B⁴ is mounted the forwardly-directed tongue *b*⁴, having beneath it the groove *b*⁵.

C is an oblong frame, having at its front the

bar C' and at its rear the rod or bar C², and its length between the ends is three half-steps greater than that of the frame D, below described.

5 On the lower surface of the bar C' are twelve notches, c', spaced the same as the pegs b² and the keys of the board A. These notches are engaged by a pin, b³, projecting from the rear side of the peg-bar B'. This makes it possible
10 to shift said frame C to the right or left, and secure it against lateral movement over any point in the board A which may be selected. C³ C⁴ are handles extending from the frame C toward the player. By these he may lift the front of
15 said frame high enough to release the notches c' from the peg b³, and then shift the frame and let its weight bear it down again and cause another notch, c', to engage the peg b³. On the inner face of the bar C' is a ledge, c², upon
20 which rests one edge of the frame D, described below.

D is another rectangular frame one octave shorter than the board A, composed of the front and rear bars, D² D', connected by end
25 pieces, d' d², and having a shifting-bar, D³, between them. The rear side of the bar D' is grooved to receive the rod C² and ride thereon, and said rod is held loosely in said groove by a strip, c³, or otherwise. The frame D rests
30 within the frame C, and is of sufficient width to fill the space between the bars C' and C², while its length is three keys or half-steps less than the interior length of the frame C, thus permitting the frame D to shift within the
35 frame C three half-steps, and no more. The bar D³ is of sufficient width to fill the space between the bars D' D², while it is made a half-step shorter than the space between the ends d' d², in order that it may be shifted longi-
40 tudinally with reference to said bars D' D² one half-step, and no more. Said bar D³ may be supported in any suitable manner. The drawings, Fig. 2, show pins d³ projecting from the ends of the bar and lying loosely in a hole in
45 the end pieces, d' d².

D⁴ is a lever attached to bar D³ and projecting toward the player, by which the bar D³ and the frame D are tilted and shifted. When the bar D³ rests against the end piece, d², and
50 the whole frame D rests at its farthest point to the right in frame C, it is necessary to lock or secure both. This is done by means of a projection, d⁴, on the under side of the lever D⁴, which engages in a notch, c⁴, in the bar C'.
55 As the bar D³ shifts one half-step within the frame D and the frame D shifts three half-steps, (carrying the bar D³ with it,) the bar D³ is carried to the left a total distance of four half-steps, consequently a second notch, c⁴,
60 placed four half-steps to the left of the first, is required to lock the lever D⁴ when it has been moved to its farthest limit to the left. At the rear of the frame D is fixed the rearwardly-directed tongue d⁵, which rests in the groove b⁵.
65 The inner ends of my keys E may be made of wood or other suitable material, and may be formed and secured like the inner ends of

the ordinary keys of the organ, and each resting at its outer or middle portion on a peg, b'. I use only seven keys in each octave, and these, 70 when the bar D³ is at its farthest limit to the right, are spaced according to the major scale. All the keys of each octave, excepting the third and sixth, are mounted upon the bars D' D², while the third and sixth are mounted upon 75 the bar D³, in order that they may be shifted to the right or left a half-step with reference to all the other keys, thus changing the spacing from major to minor and from minor to major. The outer ends of the keys may be continuous 80 with the inner ends, and the same in form as the ordinary piano or organ keys; but I prefer to use the form shown in the drawings. This consists of a piece of wire or sheet metal, E', suitably attached to the front end of the 85 wooden part of the key, and bent downward just outside of the peg-board B', as shown, until it almost touches the board B², (or the key-board A when the board B² is not used,) then outward horizontally about three-fourths 90 of an inch, or more, and then upward a suitable distance to receive or constitute a finger-piece.

F is a face-board projecting downwardly in front of the peg-board and extending the full 95 width of the organ. By extending said face-board lower down than the upper face of the peg-board B' the interior of the organ is completely concealed from view and a finished appearance is given to the organ, and the object 100 of the downward bend in the arms E' of the keys E is to make room for said face-board. The handles C³ C⁴ and the lever D⁴ are also similarly bent for the same purpose. Said face-board F may be a continuation of the 105 front of the ordinary stop-action, which is to be raised from its customary position on the board A and placed just above my harmonic board.

A horizontal board or bar, which may be 110 the foot-board of the stop-action, as shown in Fig. 7, is placed above the upper surface of the peg-bar B' a distance less than the length of the pegs b². This prevents the pegs over which no keys rest from falling out of their 115 holes when the organ is turned over during transportation. The pegs may then be plain shafts without heads, spurs, or notches to secure them in the holes, which is a much more simple construction than previously shown. 120 A line of muffling may be glued on the key-board A just beneath the ends of the pegs.

The finger-pieces E² of the keys are preferably arranged in three rows or banks, each row or bank comprising the keys belonging 125 to one of the harmonic divisions, as described in Letters Patent No. 204,981, granted to me September 9, 1884. This is accomplished by bending the outer ends of the arms E', so that they will stand in three different vertical 130 planes, and making the ends in the second row a little higher than the first and the third a little higher than the second. As the first, fourth, and fifth notes of the scale throughout

the several octaves each belong to two harmonies, the keys representing such notes are each bent so as to extend horizontally into two banks or rows, Figs. 7 and 9. It is obvious that a wooden key might also be notched so as to bring finger-surfaces into two different banks.

G and H, Fig. 10, are indicator-scales placed on the face-board F, one back of the handle C³ and the other back of the handle C⁴, divided longitudinally into twelve spaces of the same width as the keys in the key-board A, and the vertical shanks or the heads of said handles C³ C⁴ serve as pointers for said scales. Said twelve spaces represent the half-steps of one octave of the key-board A. On one of said scales the spaces are marked with the Roman letters and a sharp or flat (when needed) representing the key-notes of one octave. In the spaces of the other scale are marked the necessary number of sharps or flats, or both, to represent the signatures as usually printed at the beginning of pieces of music.

The operation of my key-board is as follows: With the frame D and bar D³ moved to their farthest limit to the right in the frame C, the keys, as before stated, are spaced according to the major scale, and the board is then adapted to play music written in that scale. The entire board may now be shifted over the board A by lifting the handles C³ C⁴ and stopping over the desired key-note in the board A, in the manner described in my former patent, above referred to, and as is done with ordinary transposition-boards. The proper position is shown by the indicators described. If the player knows the key, and not the signature, in which the music to be played is written, he moves the entire board until the handle C³ stands before the proper letter in the scale opposite said handle. If he has the written music before him, he shifts the entire board until the handle C⁴ stands before the space in the other scale, which contains the same signature he finds at the beginning of the piece. Thus if the signature of the piece is three sharps the handle C⁴ is placed before the space in the scale on which three of these characters are marked. This latter provision, it will be seen, enables the player to set the board without taking the trouble to remember or ascertain what letter corresponds to a certain signature.

If it is desired to play in the minor, and the board is set for the major, the lever or arm D⁴ and the board D³ are moved one half-step to the left, the stationary keys forming a stop. This moves the third and sixth keys each a half-step to the left and spaces the entire board according to the minor scale. When the music changes from major to relative minor, the entire frame D and bar D³ are shifted by means of the lever D⁴ to the farthest limit to the left, the frame C in the meantime remaining stationary. This changes the spacing and position of all the keys to relative minor. In find-

ing the position of the board by the scale it will make no difference whether the board is to be used in the major or minor, the signature for each being the same. In shifting the board by either the handles C³, C⁴, or D⁴, the entire frame D and bar D³ are tilted, whereby all the keys E are raised from the upper ends of the pegs b².

In the application herein referred to an indicator-scale is shown having the Roman letters and sharps or flats indicating the key-notes, and the sharps and flats indicating the signatures marked in the same vertical spaces. This, it has been found, requires so much vertical space that it cannot be conveniently placed on the face-board F, the latter being of necessity made narrow. Furthermore, it improves the appearance of the instrument materially to place a narrow scale at each side of the instrument, rather than one wide one at one side. It will be observed, also, that symmetry cannot well be produced by placing a single scale at the middle of the instrument, because it is difficult to mount a pointer at the middle in such manner as not to interfere with the movements of the keys while the frame C remains stationary.

I claim as follows:

1. In a musical instrument, a transposition key-board composed of a frame, C, and frame or board D, resting within said frame C, said transposition-board resting loosely in open grooved or angular ways, whereby said board is restrained from shifting in a transverse direction, but is permitted to be shifted longitudinally and to be raised at its front side or lifted entirely from said ways, substantially as herein set forth.

2. In a musical instrument, a transposition key-board composed of a frame, C, and frame or board D, resting within said frame C, said transposition-board resting loosely on a way or ways, while its rear portion is loosely engaged by a horizontal groove and tongue or hook, and its front portion rests against a relatively-fixed parallel bar, whereby said key-board is restrained from shifting transversely, but is permitted to be shifted longitudinally and to be raised at the front side, or lifted entirely from its seat, substantially as herein set forth.

3. In a musical instrument, the combination, with the frame C and frame or board D, having the tongue d⁵, of a bar, B⁴, having the groove b⁵, and the bar B', substantially as shown, and for the purposes set forth.

4. In a musical instrument, the combination, with the frame C and frame or board D, having the tongue d⁵, of a bar, B⁴, having the groove b⁵, and the bar B' and ledge B³, substantially as and for the purposes set forth.

5. In a harmonized key-board having the finger-pieces arranged in banks, substantially as described, keys E, which extend outwardly to the first bank, of which they are to form a part, then upwardly to the level of said bank, then outwardly across said bank, then down-

wardly to the level of the next bank, of which they are to form a part, then outwardly in said second bank, substantially as shown and described.

5 6. In a musical instrument having a transposition key-board, a pair of separate indicator-scales, one bearing the characters indicating the signatures usually printed at the beginning of pieces of music, and the other
10 bearing the characters used to represent the

key-notes, in combination with a pair of pointers mounted upon the transposition-board, and carried by the latter before said indicator-scales, substantially as shown and described.

In testimony whereof I affix my signature in 15 presence of two witnesses.

WORTHINGTON T. WEIR.

Witnesses:

CYRUS KEHR.

CHARLES H. ROBERTS.