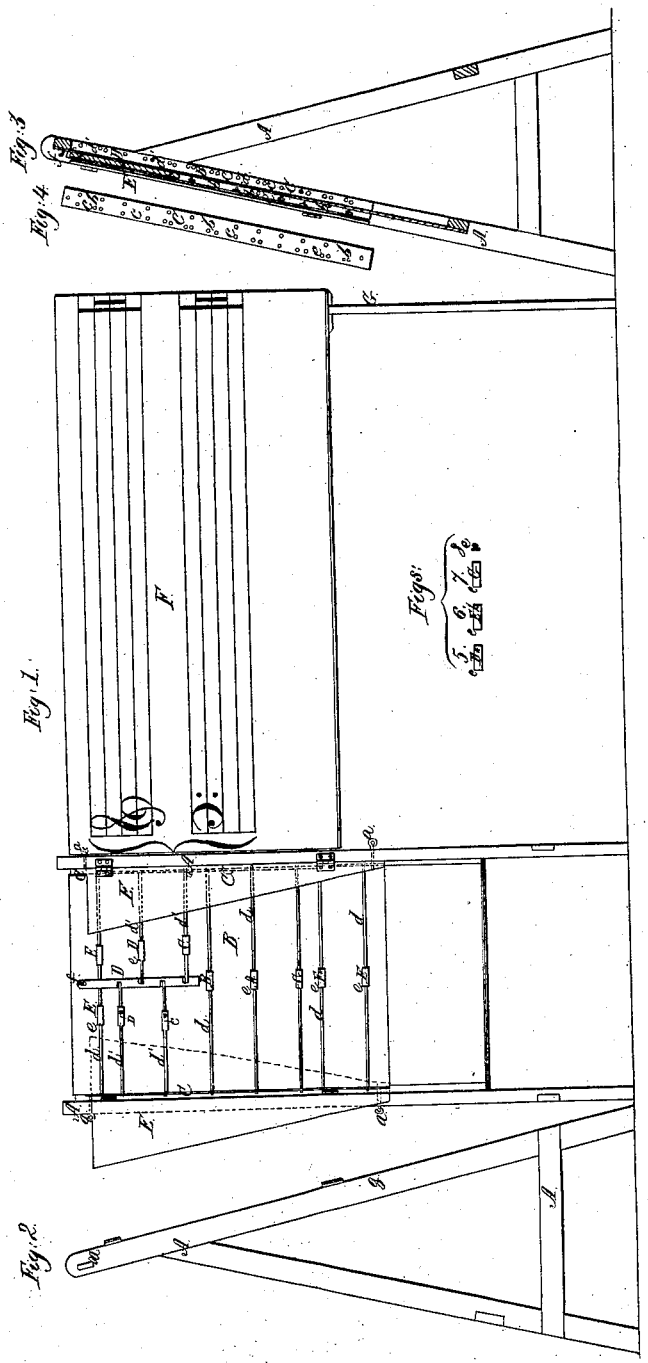
W. B. Billings,

Musical Notation,

No. 7,628, Patented Sep. 10, 1850.



UNITED STATES PATENT OFFICE.

W. B. BILLINGS, OF EASTPORT, MAINE.

MODE OF REPRESENTING MUSICAL SCALES.

Specification of Letters Patent No. 7,628, dated September 10, 1850.

To all whom it may concern:

Be it known that I, W. B. BILLINGS, of Eastport, in the county of Washington and State of Maine, have invented a new and useful apparatus for representing all the musical scales, to be used in giving instruction in singing or for other purposes, which I denominate "The Diagramma Numerosum;" and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1, is a front elevation. Fig. 2, is a side elevation. Fig. 3, is a transverse section taken through the center of the board on which the scales are represented. Fig. 4, represents one of the perforated side pieces. Figs. 5, 6, and 7, represent front views of the letter plates for indicating the notes or sounds that the bars are intended to represent. Fig. 8, is a side or edge view of one of the letter plates.

Similar letters of reference indicate corresponding parts in each of the several figures.

The nature of my invention consists of a frame of wood carrying a board representing the ground work of the scales, at each side of the board are placed movable bars of metal or wood each provided with corresponding series of holes which receive the ends of the cross bars or wires, the holes in the side bars being so arranged that by means of the required number of cross bars, and a movable center piece, all the major or diatonic scales and their relative minor scales, the chromatic scale and the enharmonic scale may be represented, a letter being attached to each bar to indicate what sound it represents; attached to one side of the frame is a board having staves marked upon it to assist in explaining the necessary exercises.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and practical application.

A, A, is a light wooden frame carrying a board (B), on which a quadrangular black surface is marked out.

C, C, are thin bars of wood or metal which fit in grooves at the sides of the board B, and are secured by pins (*a*), (*a*), passing through the sides of the frame A, A, each side bar is provided with two series of holes, one series consisting of thirteen (13) *b*, *b*, *b*, at regular intervals apart, and the other of twenty-two (22) *c*, *c*, *c*, being at irregular intervals; the bars C, C, project above the face of the board so as to leave the holes clear.

d, *d*, *d*, are bars or wires of sufficient length to reach across the frame having their ends fitting to the holes in the side bars d^1, d^1, d^1, are shorter bars reaching only half across the board being supported at one end in one of the side bars C, C, and at the other in a movable center piece (D), which is hung on a small hook *f*, and has holes corresponding to the four below the top one of the holes *b*, *b*, *b*, (the center piece D, and the short bars d^1, d^1, d^1, are only used in representing the minor scales).

e, *e*, *e*, (Figs. 1, 5, 6, 7, 8) are small metal plates which may be either made to fit easily to slide on the bars *d*, *d*, *d*, *d′*, *d′*, *d′*, or may be permanently secured to them, the plates have each the name of a note or musical sound marked upon them to denote what sound each bar *d*, or *d′*, is intended to represent on the scales E, E, are wings made of thin slabs of wood, they are attached by hinges to the sides of the frame A, A, and when closed give the scale represented by the bars on the black board the appearance of a ladder, (one of the wings is represented in Fig. 1, thrown open to show the ends of the bars *d*, *d*, *d*, and *d′*, *d′*, *d′*, fitting the side bar C, its position when closed is shown by dotted lines). F, is a board attached to one side of the frame A, A, and having an extra support G, it has two scales marked upon it for the purpose of assisting the person who explains the scales, who can represent notes upon it by marking.

The practical application of the apparatus is as follows: In vocal music a great number of scales are employed as the chromatic scale, several major or diatonic scales, and their relative minors, and the enharmonic scale; if these were each shown by a separate diagram or board the whole apparatus would be very cumbrous. It is not necessary here to explain the nature of the several scales but merely to explain briefly how they are represented. Either set or series of the holes in the side bars C, C, can be placed in the front of the board, (in Figs. 1 and 3, the series *h*, *h*, *h*, at regular intervals apart are so represented) and upon them any person versed in musical science can with the wires or cross bars *d*, *d*, *d*, and

d', d', d', build the chromatic scale, or any of the major or diatonic scales with their relative minors; the chromatic and major scales are formed of bars extending right across the frame, but as some of the upper notes in the minor scales do not fall in the same place in ascending and descending, it is necessary to divide the upper part of the scale, the bars to the left representing the position of the notes in ascending, and those to the right their position in descending (the wires are arranged in Fig. 1 to represent one of the minor scales). When it is required to form the enharmonic scale the bars C, C, are taken out and turned around to bring the holes c, c, c, in front (as shown in Fig. 4) and the scale built up by the wires d, d, d, the plates e, e, e, always being put on the wires or bars before they are put in their places, to indicate what sound they represent. The scales will be very clearly represented, the wires or cross bars being kept bright and the board before which they are placed being black, they will be shown up very distinctly.

Having described my invention, I will now state what I claim as new and desire to secure by Letters Patent—

I claim, the manner herein described of representing, each and all of the scales used in music by the combination of the board B, the side bars C, C, the center piece D, and the bars d, d, d, and d', d', d', having letters attached to them to indicate the name of the notes or sounds they represent; or any other combination of parts substantially the same.

W. B. BILLINGS.

Witnesses:
S. D. JENKINS,
C. F. BACHELOR.