2 Sheets—Sheet 1.

B. BISHOP.

ATTACHMENTS FOR KEY-BOARD MUSICAL INSTRUMENTS.

No. 186,298. Patented Jan. 16, 1877.

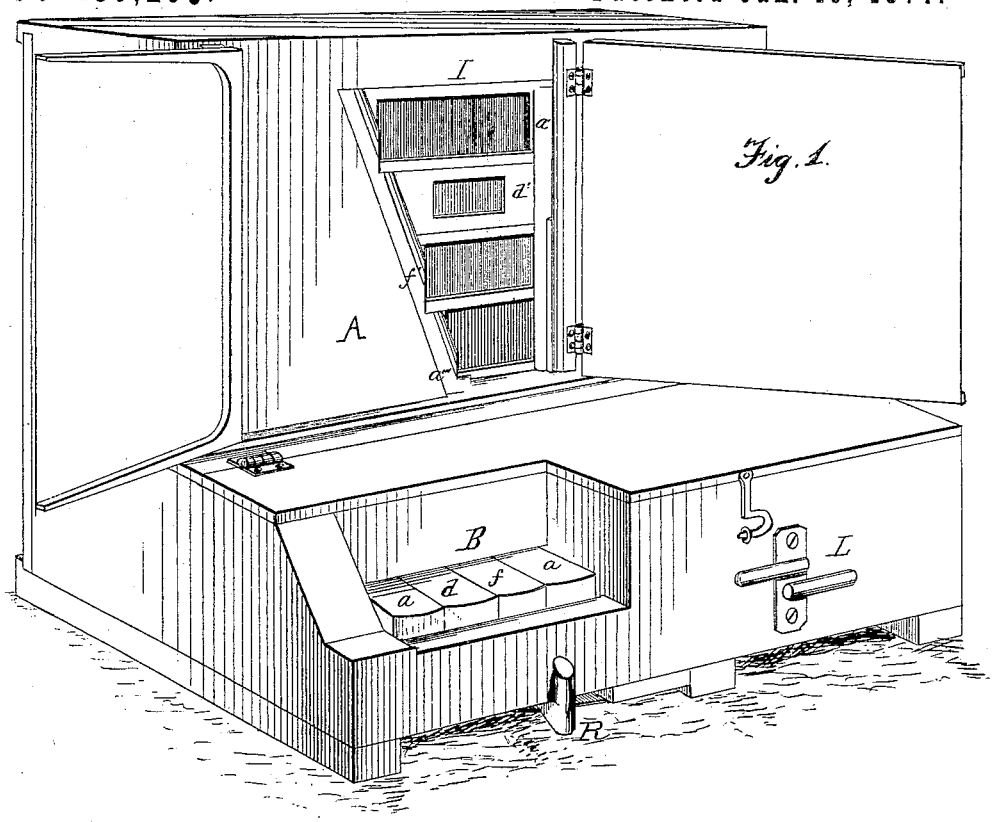

Fig. 1.

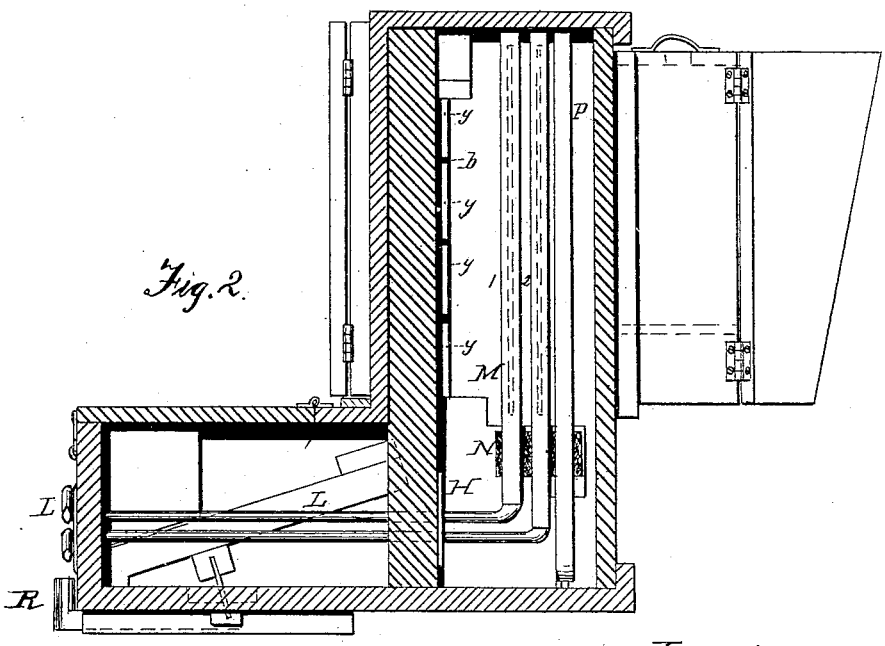

Fig. 2.

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Cox and Leot

2 Sheets—Sheet 2.

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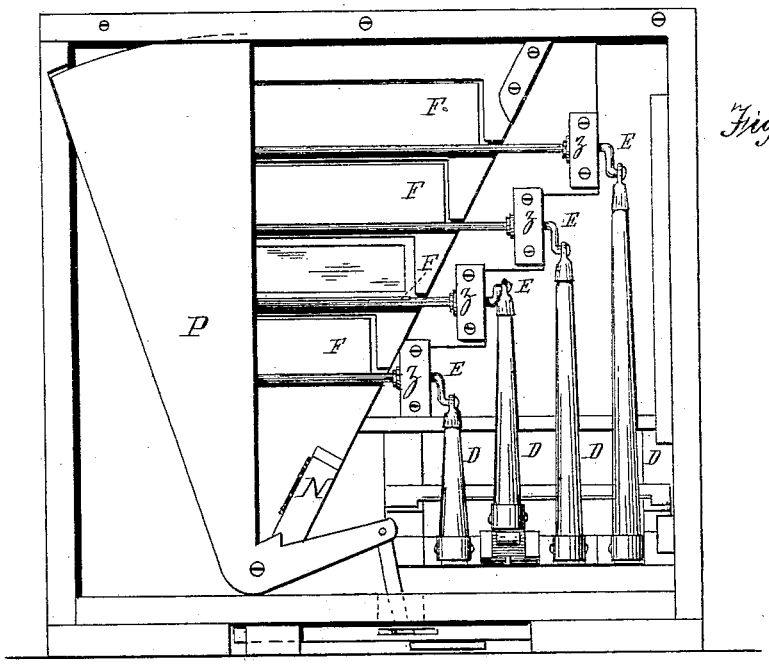

Fig. 3.

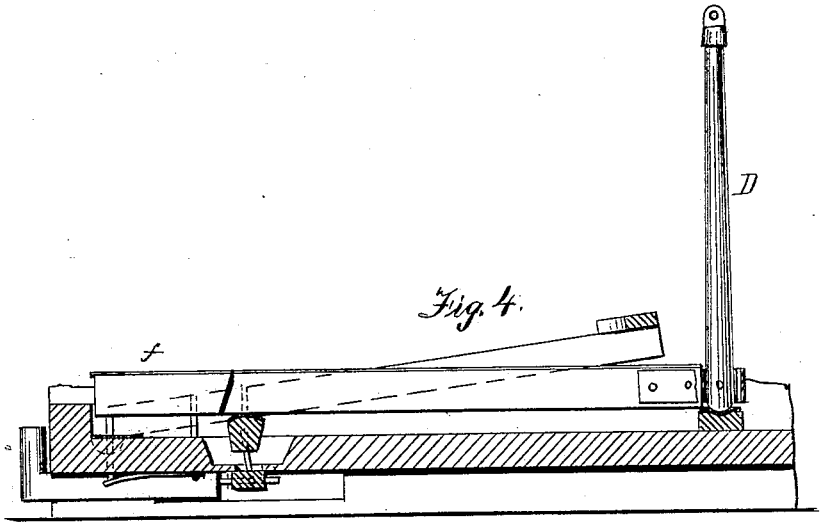

Fig. 4.

Witnesses;
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Cox and Lea

UNITED STATES PATENT OFFICE.

BAINBRIDGE BISHOP, OF NEW RUSSIA, NEW YORK.

IMPROVEMENT IN ATTACHMENTS FOR KEY-BOARD MUSICAL INSTRUMENTS.

Specification forming part of Letters Patent No. **186,298**, dated January 16, 1877; application filed June 7, 1876.

To all whom it may concern:

Be it known that I, BAINBRIDGE BISHOP, of New Russia, in the county of Essex and State of New York, have invented a new and useful Improvement in Instruments for Displaying Color, of which the following is a specification, reference being had to the accompanying drawings.

The invention relates to the art of typifying musical sounds by the display of colors, and, in the present instance, is exhibited in the device formed of elements hereinafter described.

It is well known that there are seven cardinal colors in the prism or spectrum, and also that there are seven cardinal sounds in the musical scale. Thus, the colors of the spectrum are as follows, in the order stated, to wit: violet, indigo, blue, green, yellow, orange, and red, while the sounds of the musical scale are as follows, in the order stated: do, re, mi, fa, sol, la, si, or, according to the literal scale, *c*, *d*, *e*, *f*, *g*, *a*, *b*. It is, therefore, clear that each cardinal note or sound may be represented by a color in the natural key in the order of colors shown in the spectrum; also, the sharp or flat of a note can be typified by blending the color it represents with, respectively, the next color on each side. Thus, if the natural note be represented by green, the sharp would be indicated by blue-green—the color produced by blending green, the typical color, with blue, the next color above; and the flat would be indicated by yellow-green—the color produced by blending green, the typical color, with yellow, the next color below.

Octaves may be indicated by deepening the tone of the color in the descending scale. Thus, the higher note being, for instance, represented by orange, the octave below would be a deeper orange.

I have discovered, and it is part of this invention, that the object I seek to attain will be very fully effected by adapting the colors to the key or scale of A minor, so that the different tones and semitones will be represented as follows: A, indigo; B, violet-red; C, red; D, orange; E, yellow; F-sharp, green; G-sharp, blue; A, indigo; B, violet-red; C, red.

Semitones: A, indigo; A-sharp, violet; B, violet-red; C, red; C-sharp, orange-red; D, orange; D-sharp, orange-yellow; E, yellow; F, yellow-green; F-sharp, green; G, green-blue; G-sharp, blue; A, indigo; A-sharp, violet; B, violet-red; C, red.

It is plain that the key of A minor is not the only one which permits of the adaptation described. Thus, the scale of color may be transposed and adapted to the key of C major and other keys, or the colors otherwise adapted so that the cardinal and modified colors will correspond with the tones and semitones, as specified, and the same intervals and order of arrangement be preserved.

The device in which the invention has been embodied is illustrated in the accompanying drawings, which represent, respectively, in Figure 1, a perspective view of a device embodying the elements of the invention; in Fig. 2, a sectional view of same, and in Fig. 3 a rear view of same with one of the screens F lowered. Fig. 4 is a sectional view, showing one of the keys and its connection with the pitman-rod.

In the accompanying drawings, A represents the case of a melodeon or organ, it being obvious, however, that the invention can be applied to a piano-forte or other analogous instrument. The front of the case, upon one side, is provided with the bank of keys B, representing the notes or letters *a*, *d*, *f*, *a*, of the musical scale, and so lettered, which extend rearward, and have attached at their inner extremities the lower ends of the pitman-rods D, extending upward, and having their upper ends pivoted upon the outer ends of the crank-shafts E, which are of graduated lengths, as desired, and extend through the block *z*, in which one side is journaled, the other end working in a bearing in the cleat *b*. To these crank-shafts E are rigidly secured the lower edges of the blinds F, which, with the adjacent parts of the shafts, fit snugly in the recesses *y*, provided for them in the partition H, which, directly opposite the blinds F, is provided with a series of panes, I, of stained glass of the various desired colors, and, in the present instance, lettered *a'*, *d'*, *f'*, *a'''*. Thus, suppose the colors of the panes I shown in the present instance represent *a d f a*, the keys B

being connected in any suitable manner with the reeds of an organ, when one of the keys is struck—for instance, *f*—the pitman-rod D is forced up, rotating the crank-shaft E, opening the corresponding blind, and thus, if a strong light be placed at the rear of the device, an indigo light, indicating *f*, is at once shown at the same time the reed of the key *f* speaks.

The arrangement of the colored panes is merely a matter of mechanical construction. Thus, panes of glass of the colors blue-green, representing *d*-sharp, and yellow-green, representing *d*-flat, could be readily inserted in proximity to the pane representing green, and operated by keys placed in the manner usual in piano key-boards.

Upon one side of the case A, in proper relation to the key-board, are provided the stops L, connected with the stop mechanism of the organ, and having their shafts extending through the case, and working in bearings in the front part thereof and the partition H, in the rear of which they are attached to the base of the triangular translucent screens M, of such dimensions that, when operated, they will shut off the light from the panes I.

Opposite the base of the screens is provided the inclined bumper N, to receive the screens when operated, and hold them in position. In the present instance these screens are colored yellow and red, and are numbered, respectively, 1 and 2, and represent, respectively, the key-notes, to wit, *c* and *a*. Thus, when the performer is playing in the key of *c* or *a*, the yellow screen 1, or the red screen 2, is respectively operated.

In a full-sized instrument there should be twelve of these screens, each of the color indicative of the key in which the performer is playing. The stops for operating the screens may readily be arranged in a manner analogous to that shown of the stops L.

In the rear of the screens is placed another screen, P, of semi-opaque material, and similar in shape to the screens M. This screen P is operated by means of any suitable attachment to the lever R, which works the swell of the organ, and thus the volume of light may be instantly increased with the increase of the volume of sound by simply moving the pedal.

It is obvious that the device may be used in conjunction with an organ, or any other instrument having a key-board, or it may be wholly detached therefrom, and provided with an independent series of keys.

In practice, the instrument is placed before a strong natural light, either direct or deflected, and the colors may be shown upon screens or other suitable surfaces.

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

1. The combination, with a musical instrument, of a device arranged to exhibit a series of colors corresponding with the notes played, substantially as specified.

2. An instrument having a series of movable colored plates combined with apparatus for producing musical sounds, and provided with a movable colored screen or screens, as set forth.

In testimony that I claim the foregoing improvement in instruments for displaying color, as above described, I have hereunto set my hand this 22d day of April, 1876.

BAINBRIDGE BISHOP.

Witnesses:
BYRON POND,
ALMON PORT.