

B. G. KINGSLEY.
ILLUMINATING ATTACHMENT FOR KEYBOARD MUSICAL INSTRUMENTS.
APPLICATION FILED SEPT. 29, 1919.

1,401,608.

Patented Dec. 27, 1921.

4 SHEETS—SHEET 1.

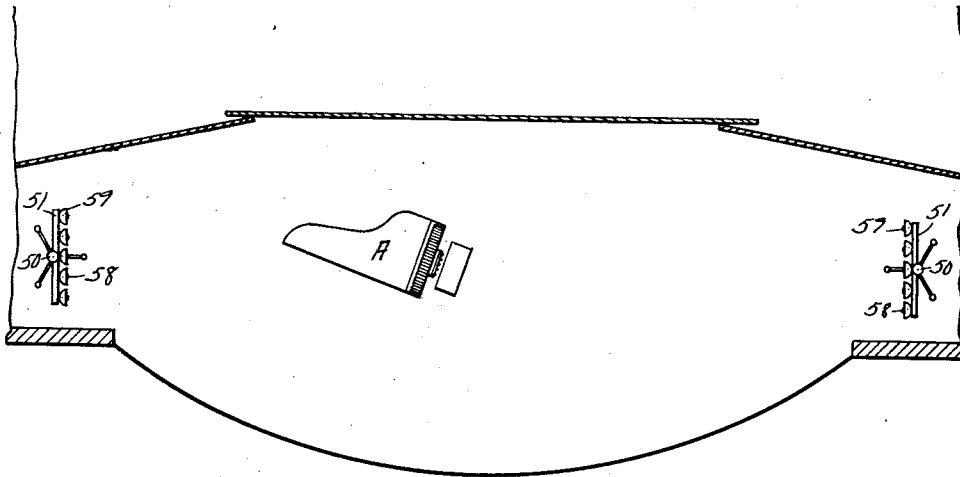


Fig. 1

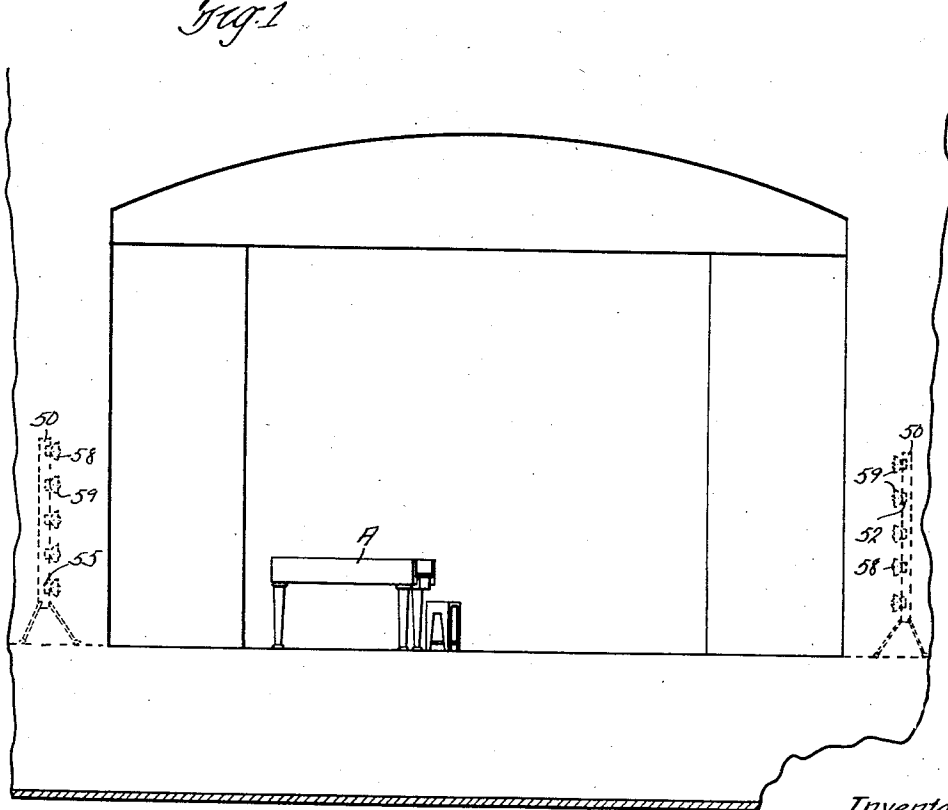


Fig. 2

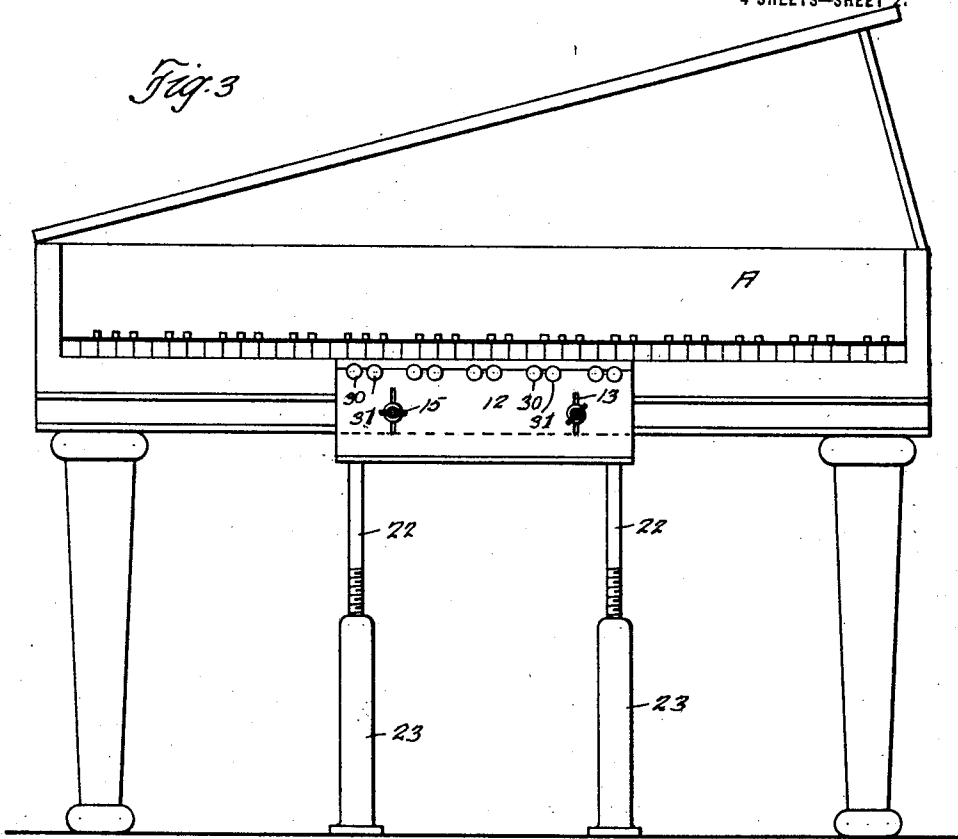
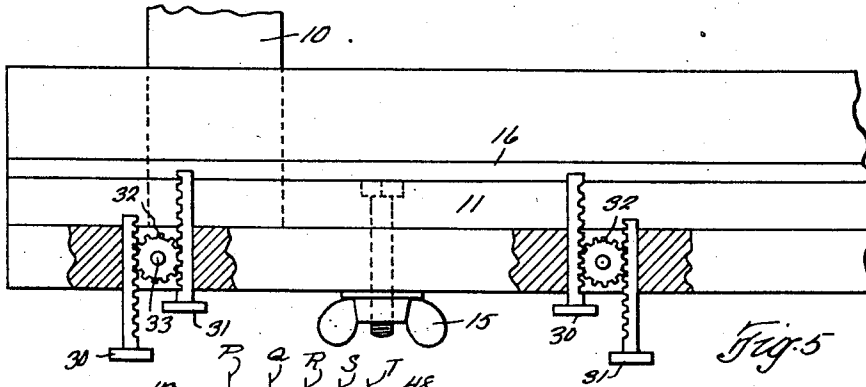
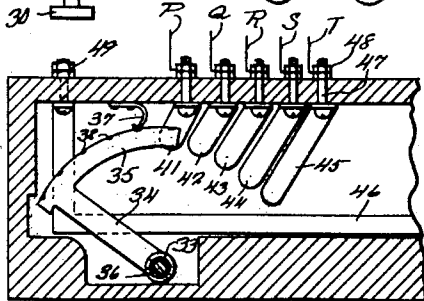
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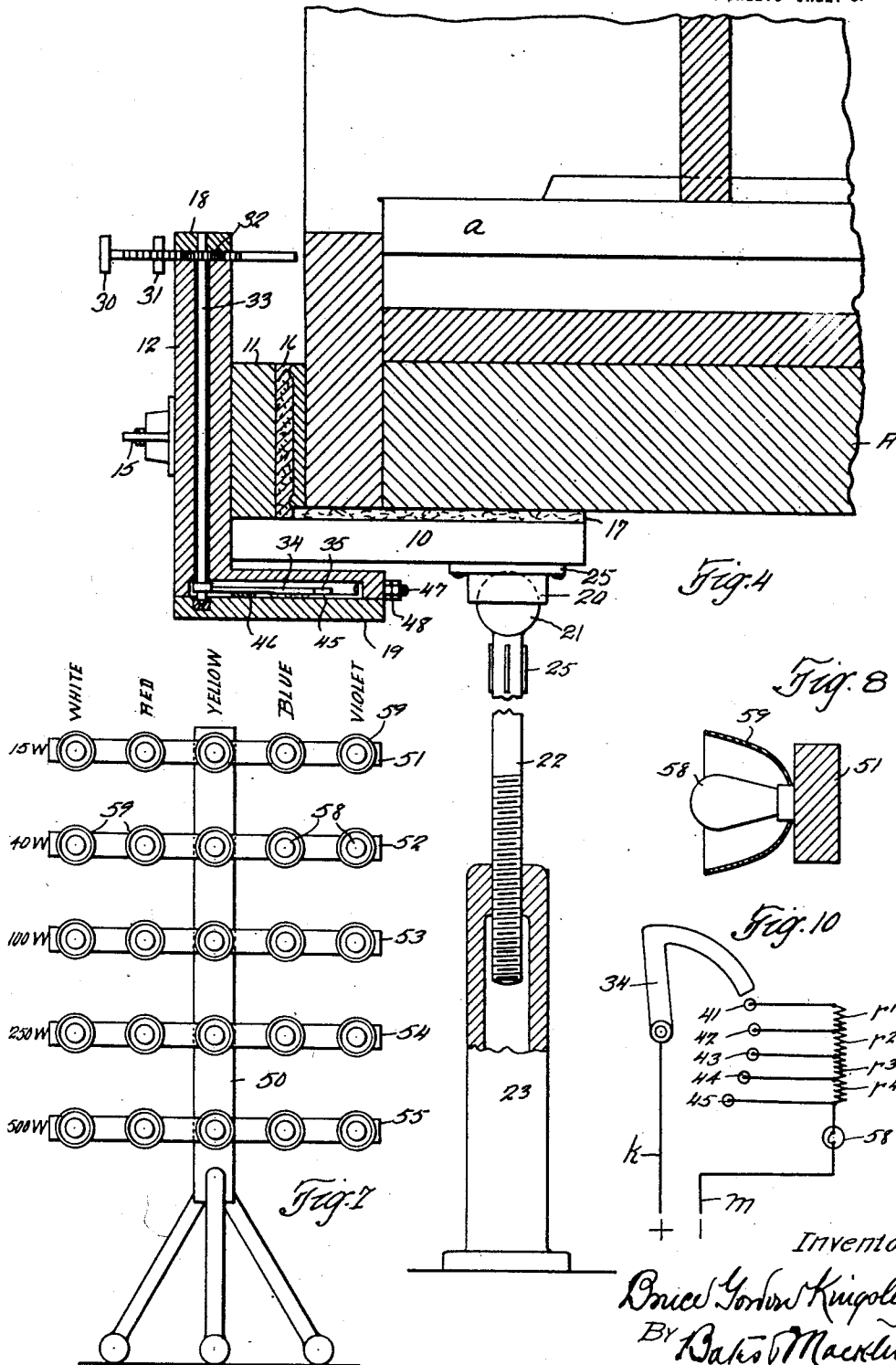
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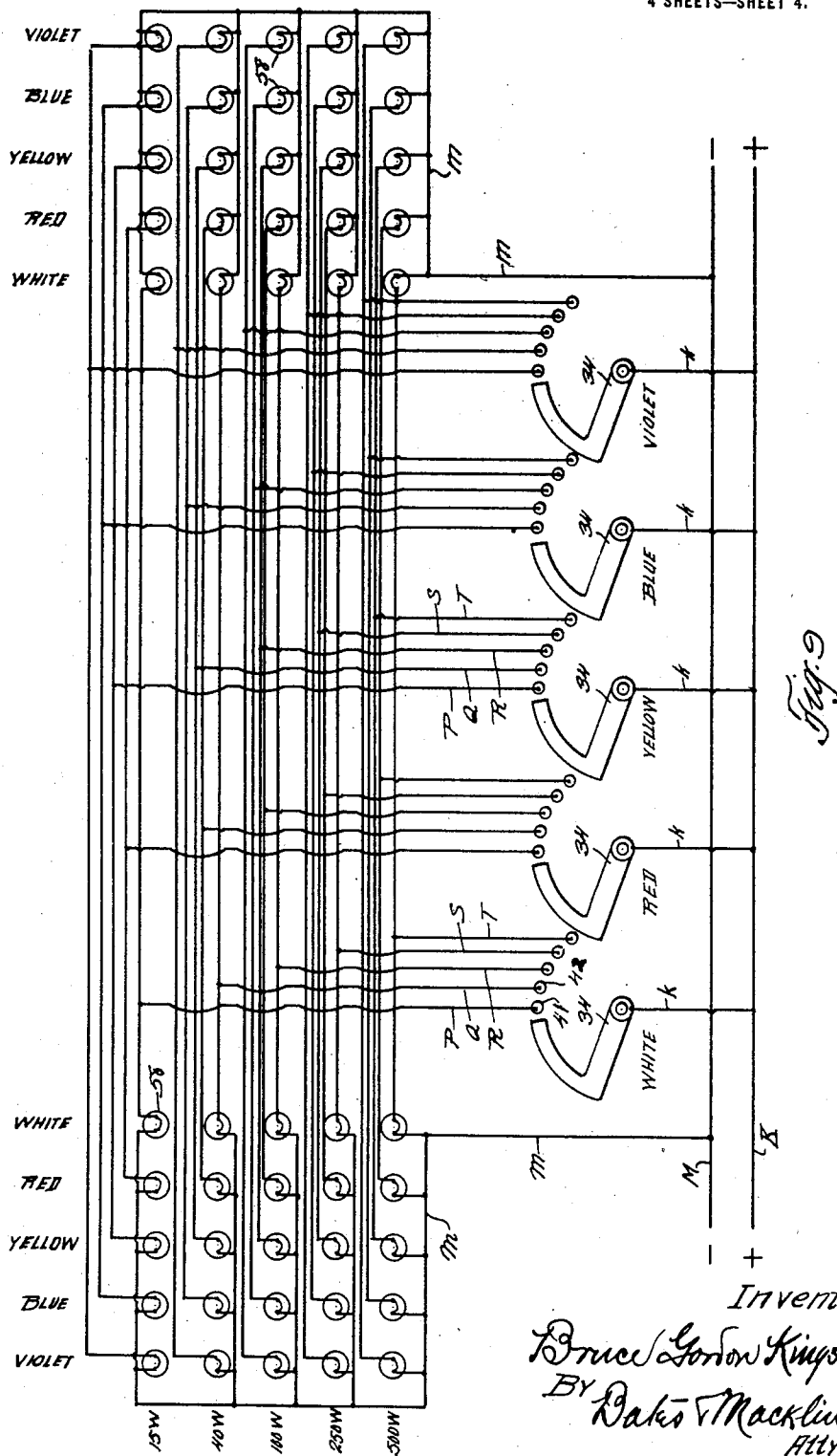
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UNITED STATES PATENT OFFICE.

BRUCE GORDON KINGSLEY, OF LOS ANGELES, CALIFORNIA.

ILLUMINATING ATTACHMENT FOR KEYBOARD MUSICAL INSTRUMENTS.

1,401,608.

Specification of Letters Patent.

Patented Dec. 27, 1921.

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To all whom it may concern:

Be it known that I, BRUCE GORDON KINGSLEY, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a certain new and useful Improvement in Illuminating Attachments for Keyboard Musical Instruments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to means adapted to be associated with a musical instrument having a key-board, such as a piano or organ, enabling the performer to readily provide various kinds of illumination appropriate to the piece he is playing.

To this end I have provided a simple switching attachment for the piano or organ. This attachment has a set of switches with their actuators arranged in such position that they may be operated by the player while his fingers are on the keys of the piano or organ and control circuits to suitable electric lamps of various colors, each switch corresponding to a given color. I also arrange the switches and circuits so that varying intensities of light may be produced by varying actuations of the switch. Thus the switch may, for instance, gradually cut out resistance to increase the intensity of the light or it may connect in the circuit additional lamps for the same purpose. I prefer to make, as the switch actuator, a pair of push buttons acting complementarily, the one serving to swing a switch arm in the "on" direction and the other in the "off" direction, the pushing in of one button being accompanied by an automatic outward movement of the other.

All of the above mentioned features, and others contributing to the efficiency of my system, are included within my invention. The invention is hereinafter more fully described in connection with the embodiment thereof illustrated in the drawings and is summarized as to its essential novel features in the claims.

In the drawings Figure 1 is a diagrammatic plan, and Fig. 2 a diagrammatic elevation of a stage on which stands a piano equipped with my switching attachment, and in the wings of which are illuminating standards controlled by the switches. Fig. 3 is a front elevation of the piano equipped with my attachment; Fig. 4 is an enlarged vertical section of the switching attachment

and the adjacent portion of the piano keyboard; Fig. 5 is a sectional plan of a portion of the attachment; Fig. 6 is a horizontal section of a portion of the switching attachment adjacent to one of the switch arms; Fig. 7 is a front elevation of one of the lamp standards; Fig. 8 is a detail illustrating the reflector about the lamps; Fig. 9 is a diagram of electric wiring which may be employed; Fig. 10 is a diagram illustrating a modification of the electric connections.

As shown in Figs. 1 to 4, A is the case of the piano, the keys of which are designated *a*; the switch attachment is adapted to be removably clamped to the under side of the piano with the switch actuators in front of and slightly below the keys. As shown, the frame of the attachment comprises a base strip 10 to which is attached an upright strip 11. To provide the adjustment the strip 11 may carry studs projecting through slots 13 in the plate 12, these studs having wing nuts 15 screwing onto them.

The device just described is suitably clamped against the under side of the keyboard frame and against the front thereof. Suitable padding, as, for instance, felt strips 16 and 17, may be inserted to prevent marring the piano. The clamping device shown consists of a pair of extensible struts which extend from the floor against the under side of the frame plate 10. As shown, the struts comprise screws and tubular standards into which they are threaded. The base plate 10 may be provided with socket members 20 having hemispherical cavities in which rest ball-shaped heads 21 of the screws 22 which screw into tubular standards 23. The standards 23 rest on the floor and by turning the screws 22 (which may be readily done by grasping the roughened portion 25 thereof) the attachment base 10 is clamped against the under side of the piano frame.

The embodiment shown is designed for connecting five sets of lights which may have different colors, as, for instance, white, red, yellow, blue, violet. The switching mechanism for each of these five sets is identical. As shown, it comprises a pair of push buttons 30 and 31, which have rack teeth meshing with a pinion 32. This pinion is rigid on a vertical shaft 33 which carries rigidly at its lower end a switch arm 34. This switch arm is adapted to connect with a series of contacts, as 41—45 carried in the

lower portion of the adjustable front frame 12. These contacts are in electric connection with the lamps, as hereinafter explained.

It will be seen that by reason of the mutual gearing of the two push buttons 30 and 31, with the switch arm, the pushing in of one button will swing the arm in one direction and result in the pushing out of the other button. A number of contacts 41-45 are provided to enable different intensities of light, as by coupling in additional lamps or cutting out resistance as may be desired.

In the particular embodiment shown, I have provided for five intensities of light for each of the five different colors, by having five switch contacts 41-45 adapted to be engaged by the arm 34. In Fig. 6, this arm is shown in first "on" position. It may be mounted on an insulating bushing 36 on the shaft 33 and may constantly contact with a conductor bar 46. It has an arc-shaped engaging portion 35, which in the first active position will contact with the first switch point 41; in the second position with the first two contacts 41 and 42; in the third position with three; in the fourth position with four, and the fifth position with all five contacts. A suitable detent device provides a slight resistance against moving the switch arm from one position to another, so that the operator may readily tell by feeling when he pushes the button from one step to the next. This detent device is shown as a spring 37 bearing against the edge of the arc-shaped portion 35 on the arm 34, and adapted to engage periodic notches 38 therein.

The particular form of switch shown in Figs. 4 and 6 may be readily constructed by making the top member 18 and the bottom member 19 removable and the pinion 32 removably secured on the shaft 33. The contacts 41, etc. may have stems secured in place by binding posts 47 provided with nuts 48. The common contact 46 may have a binding post 49. By locating the binding posts at the rear, convenient electric connections may be made. The dimensions shown for the switch proper are merely illustrative and the parts shown should be considerably heavier and more clearance allowed to carry the current sometimes desired, as will be readily understood. If desired this switch may be merely a pilot to direct a light current through corresponding relay magnets which would operate switches suitable for heavier current.

Referring now to Figs. 1, 2, and 7, 50 designates a suitable standard carrying cross arms 51 to 55 inclusive. Each of these cross arms is shown as carrying five lamps which we may consider as having colors of white, red, yellow, blue and violet. The lamps on one arm are of the same intensity, but those on the different arms are preferably of dif-

ferent intensities, increasing by sufficiently wide gaps to make a very appreciable difference in the illumination; for instance, the lamps on the arm 51 may be of 15 watts; those on the arm 52 of 40 watts; those on the arm 53, 100 watts, on 54, 250 watts, and 55, 500 watts. These selections of wattage are of course merely illustrative. The lamp standards are preferably located out of sight of the audience and each lamp is provided with a reflector to direct the light toward the piano and the performer. One of the lamps and its reflector is shown in Fig. 8, the lamp being designated 58 and the reflector 59. The five switch contacts for each pair of push buttons are connected successively with the correspondingly colored lamps carried by the five arms.

In operation, if the left hand push-button 30 is pushed in one notch, the contact 41 is engaged and the 15 watt white light is illuminated. If pushed farther, to cause engagement of the two contacts 41 and 42, the white lamps of 15 and 40 watts are illuminated, and so on, the final position illuminating all of the white lamps and providing in this case 905 watts. Similarly the second pair of push-buttons will illuminate the red lamps, the third, the yellow lamps and so on. The intensity may be varied up or down by pushing in one or the other button 30 or 31, as desired, and the lights entirely extinguished by pushing the button 31 in to its limit.

The colors of the lamps may be so selected that various shades or intermediate colors may be obtained by using two or more sets of lamps; thus, the white and red lamps together would give an approximately pink color; the red and yellow, orange; the yellow and blue a green color; the blue and violet, indigo.

It is desirable with the large number of wires necessary to control the various lamps to arrange them in a suitable cable so that they may be readily carried with the equipment, such cable leading from the piano attachment to the two standards and having suitable connection with the source of the current. I consider it desirable to have two plug terminals adjacent to the corresponding standards so that the connection may be made with the source of the current at either side of the stage.

Fig. 9 is a diagram illustrating the wiring with the lamps arranged as described. In this diagram K and M indicate the two main lines terminating at their opposite ends in plugs adapted to be connected to the source of current. Branches *k* lead from the line K to each of the switches 34, and branches *m* lead from all of the lamps to the line M. From the contact point 41 a line P passes through the 15 watt lamp having the color corresponding to the switch. A line Q

passes from the contact point 42 through the 40 watt lamp, and so on for the lines R, S and T. The various wires illustrated in the diagram may readily be combined into a cable of twenty-seven wires, that is, the five sets of five wires, P, Q, R, S, and T, and the two wires K and M.

To avoid the necessity of cabling so many wires to and from the attachment, it may be feasible to obtain different intensities from a single lamp in each color set, by means of resistance. This is illustrated in the diagram Fig. 10, where the lines from the various contacts, 41, 42, 43, and 44 lead through resistances r^1 , r^2 , r^3 and r^4 to the lamp 58, while the line from the contact 45 leads directly to this lamp. The effect of the switch arm 34 in this case is to gradually cut out resistance in series with the lamp, and thus increases its illumination.

It will be seen that my system provides a readily portable equipment adapted to be attached, for instance, to a piano on a stage, and to provide for illumination from positions hidden from the audience. The switch actuators are so located that they may be very conveniently operated by the thumbs of the player while his fingers are on the keys, and he is thus able to flood the region around the piano with an illumination of a color and an intensity which he deems most appropriate for the particular tones, chords, motifs or musical figures being produced at that time.

It is to be understood that many changes may be made in the particular form of apparatus illustrated without departing from my invention. For instance, while I have referred to lamps of various colors, this does not mean that the lamp globe must be colored as the same effect might be produced by an interposed colored pane. The variation of the intensity might be effected by means of shields operated by magnets controlled by the switches, rather than varying it within the lamp itself. Various changes in the switch mechanism and the means for holding it in place will also suggest themselves to those skilled in this art.

I claim:

1. The combination with a musical instrument having a keyboard, of a set of controlling devices located adjacent to the keyboard and adapted to control illumination of different colors independently of the keys.

2. The combination with a musical instrument having a keyboard, of a means for producing illumination of various colors adapted to interpret the emotions produced by the music and a set of controlling devices operable independently of the notes produced corresponding to the respective colors and located in a position to be engaged by the player while his hands are on the keys.

3. The combination with a musical instru-

ment having a keyboard, of a set of electric lamps adapted to give different colored illumination adapted to interpret the emotions produced by the music, a set of switches operable independently of the notes produced, one corresponding to each color, and means for holding said switches in proximity to the keyboard.

4. The combination with a musical instrument having a keyboard, of illuminating means, and means adapted to be operated by the player independently of the notes produced while playing for varying the intensity of the illumination to interpret the emotions produced by the music.

5. The combination with a musical instrument having a keyboard, of a set of controlling devices located adjacent to the keyboard and adapted to control illumination of different colors independently of the notes produced, each controlling device corresponding to a different color and having means for varying the intensity of such color.

6. The combination with a musical instrument having a keyboard, of illuminating means adapted to interpret the emotions produced by the music, and means adapted to be operated by the hands of the player while his fingers are on the keys and independently of the notes produced for controlling the character of the illumination whereby the illumination may be varied according to the operator's interpretation of the music produced.

7. The combination with a musical instrument having a keyboard, an electric lamp, a switch for the lamp, and an actuator for the switch supported in front of the keys and in position to be engaged by the hand of the player while his fingers are on the keys and independently of the notes produced.

8. The combination with a musical instrument having a keyboard, an illuminating device and a switch therefor, means for removably clamping the switch to the musical instrument with its actuating portion in position to be engaged by the hand of the player while his fingers are on the keys and independently of the notes produced.

9. The combination with a musical instrument having a keyboard, an electric switching device and an extensible structure engaging the floor and pressing the switching device upwardly against the musical instrument beneath the keyboard.

10. The combination with a musical instrument having a keyboard, of an electric switching device and a pair of extensible legs each consisting of a screw and a standard engaging the floor and pressing the switching device upwardly against the musical instrument beneath the keyboard.

11. The combination with a musical instrument having a keyboard, of an electric switching device, said switching device hav-

ing a vertically adjustable portion extending upwardly to a point adjacent to the front end of the keys and having actuating members carried by said portion.

5 12. The combination with a musical instrument having a keyboard of an electric switching device and an extensible structure engaging the floor and pressing the switching device upwardly against the musical instrument beneath the keyboard, said switching
10 device having a vertically adjustable front portion extending upwardly to a point comparatively near the front end of the keys.

13. The combination with a musical instrument having a keyboard, of a frame, a pair of extension legs engaging the floor and clamping said frame against the under side of the keyboard frame, said clamping frame having an adjustable front plate, and a
20 manually operable switch carried by said front plate.

14. The combination with a set of switches adapted to be clamped forward of and below the keyboard of a musical instrument, of
25 electric lamps for causing illumination of various colors, and circuits from the switches to the lamps.

15. The combination with a set of switches adapted to be clamped and adjacent to the keyboard of a musical instrument of a pair of standards remote from the instrument and carrying lamps for causing illumination of various colors, and circuits from the switches to the lamps of both standards.

35 16. The combination of a set of switches adapted to be clamped adjacent to the keyboard of a musical instrument and operated independently thereof, a pair of standards adapted to be located at the opposite sides
40 of the musical instrument, each standard having sets of lamps of different colors, and a set of conductors leading from the switching devices to the respective lamps.

17. The combination with a musical instrument having a keyboard, of lamps of
45 various colors, a set of switches adjacent to the keyboard, each switch governing the lighting of the lamps of one color, each

switch having several positions to cause a different intensity of such color.

18. The combination with a musical instrument having a keyboard, of a set of lamp equipments adapted to produce various colors and varying intensities of color, means removably clamped adjacent to the keyboard carrying a set of switches, each switch
55 corresponding to a different color, and each switch having various positions adapted to produce different intensities of its color.

19. The combination with a musical instrument having a keyboard, of a set of electric lamps adapted to produce various colors and varying intensities of color, means removably clamped adjacent to the keyboard carrying a set of switches, each switch
65 corresponding to a different color, and each switch having various positions adapted to produce different intensities of its color, each switch having two mutually connected push members enabling it to be operated in
70 either direction.

20. The combination with a musical instrument having a keyboard of a group of electric lamps grouped in sets of different wattage, each set having lamps of various
75 colors, a set of switches located adjacent to the keyboard of the musical instrument, each switch corresponding to one of the colors and each switch having various positions, and circuits for connecting switches with the
80 various lamps.

21. The combination with a musical instrument having a keyboard, of a standard having arms, groups of electric lamps on the arms, the lamps being grouped in sets of different wattage, each set having lamps of
85 various colors, a set of switches located adjacent to the keyboard of the musical instrument, each switch corresponding to one of the colors and each switch having various
90 positions, and circuits for connecting switches with the various lamps.

In testimony whereof, I hereunto affix my signature.

BRUCE GORDON KINGSLEY.