H. L. HENTZ & J. W. VINAL.

PHRASING ATTACHMENT.

APPLICATION FILED JUNE 22, 1908.

1,065,446.

Patented June 24, 1913.

2 SHEETS—SHEET 1.

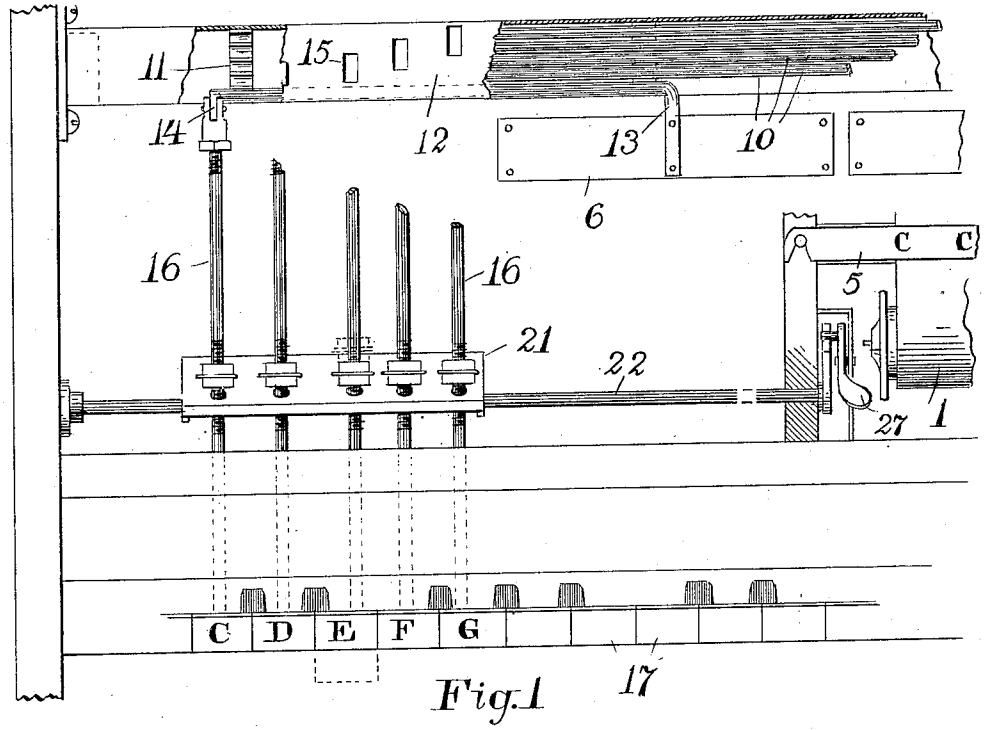

Fig. 1

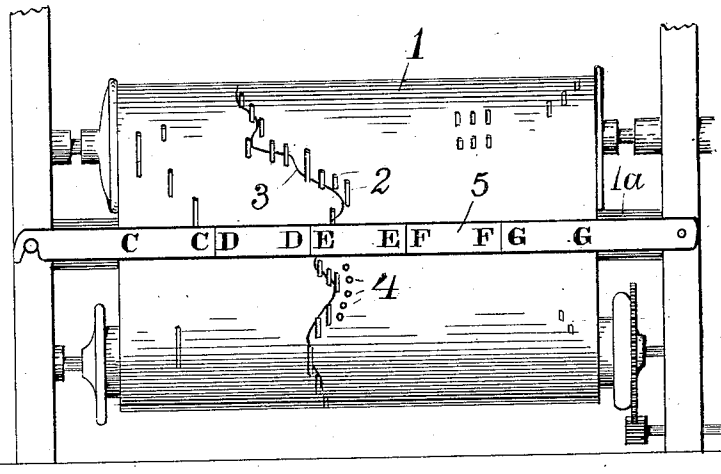

Fig. 2

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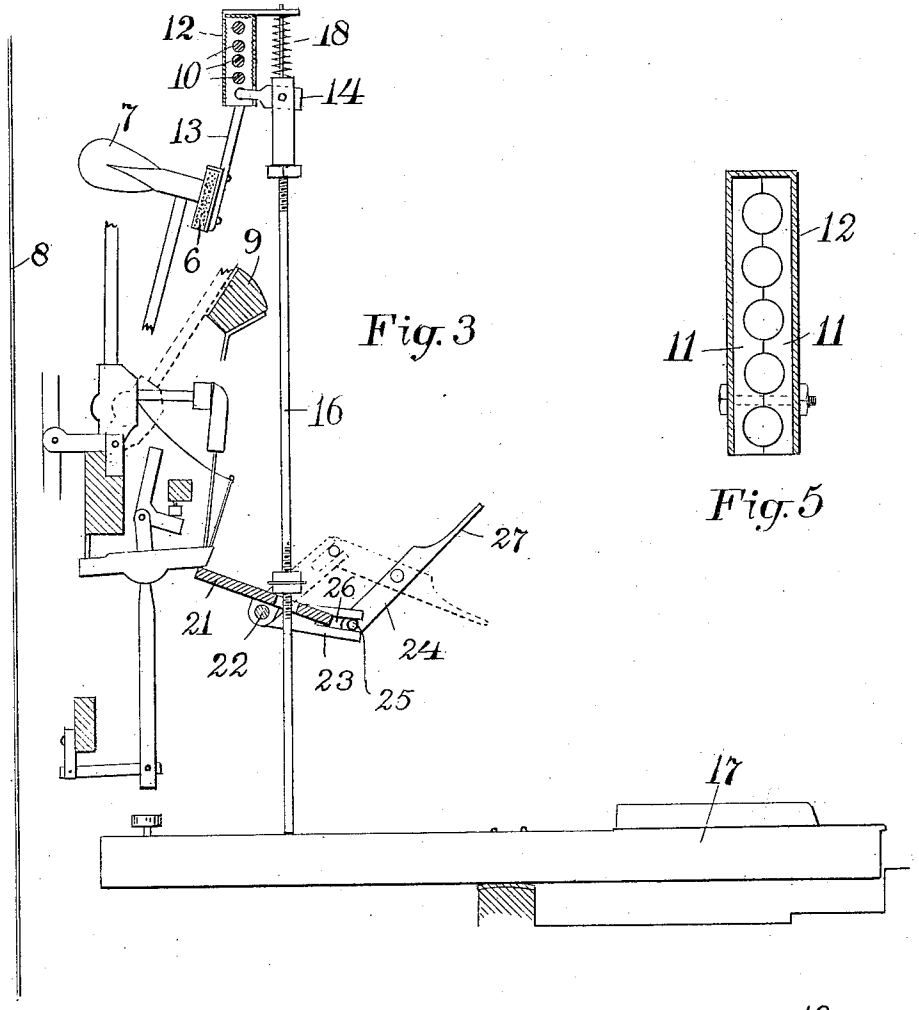

Fig. 3

Fig. 5

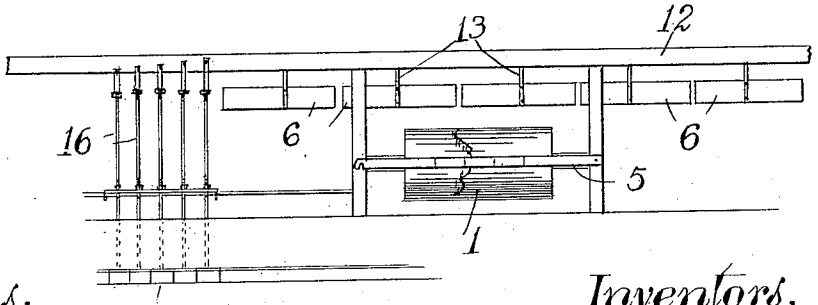

Fig. 4

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UNITED STATES PATENT OFFICE.

HARRY L. HENTZ, OF WEST NEWTON, AND JOSEPH W. VINAL, OF BOSTON, MASSACHUSETTS.

PHRASING ATTACHMENT.

1,065,446. Specification of Letters Patent. Patented June 24, 1913.

Application filed June 22, 1908. Serial No. 439,645.

To all whom it may concern:

Be it known that we, HARRY L. HENTZ, of West Newton, in the county of Middlesex, and JOSEPH W. VINAL, of Boston, in the county of Suffolk, each in the Commonwealth of Massachusetts, both citizens of the United States, have invented certain new and useful Improvements in Phrasing Attachments, of which the following is a specification.

This invention relates to mechanical piano players, and is especially designed for what are known as "interior players," but is adaptable also for the exterior, or cabinet players.

Our invention has for its object the effecting of means for enabling the operator of such an automatic player to control at will the loudness and softness of any particular part of the music being rendered, such as the melody, without affecting appreciably the remainder thereof, as the accompaniment. In other words, our improvements relate to the construction of a phrasing attachment for automatic players.

Our invention for this purpose consists, first, in providing means whereby the operator can have designated to him in what portion of the instrument lie the strings about to be sounded in a specified thread of notes, as the melody; and, second, in providing means whereby he can at will change the expression of such designated strings.

Referring to the drawings forming part of this specification, Figure 1 is a front elevation showing a portion of our attachment connected with a key manual. Fig. 2 is a front elevation of a sheet of perforated music adapted for indicating the locations in the instrument of the strings to be sounded in the execution of a specified line of notes. Fig. 3 is a side sectional elevation of a piano action and key manual having our attachment applied thereto. Fig. 4 is a front elevation in diagram similar to that of Fig. 1, but upon a much smaller scale and showing the full number of hammer-controlling devices. Fig. 5 is a cross section upon an enlarged scale of the tubular support for the shafts of the said devices.

The perforated sheet music and its operative mechanism are of the usual construction, with the exception that some particular line of the perforations, as those controlling the melody, are made to be clearly visible to the operator. Preferably such line of perforations 2 of the sheet 1 is accompanied by a printed line 3 of some contrasting color; although a series of dots or spots 4 would serve the purpose practically as well. The only important thing is that such line of perforations shall be clearly and readily distinguishable from the remainder of the same.

Immediately in front of the perforated sheet 1 where it passes over the tracker-board 1^a such as is always employed, but not so close to the paper as to interfere with suction, is secured a bar or ribbon 5 bearing upon its face a plurality of space-indications each having its individual designating character, as the letters shown. The letters illustrated are preferably C, D, E, F and G, and the purpose in selecting the same is to enable us to employ an equal number of those keys in the extreme treble or bass that are seldom or never used in manual playing of the instrument, to be utilized as expression levers for effecting the operation of the accenting device. In doing this, we provide the action hammers with auxiliary rests, each rest supporting several hammers and there being as many such rests as there are lettered spaces on the member 5, hereinafter termed the indicator. Said rests control preferably all the hammers within the range of substantially all the usual melodies. Said rests 6 are preferably five in number and supported in a position to afford a rest for the heads of the hammers 7 and to retain the latter so near the strings 8 as to substantially reduce the strength of the hammers' blows when actuated, or to be swung away from possible interference with the hammers, so that the latter can normally rest against the usual hammer-rest rail 9 and so be actuated with full strength. To thus adjust the position of any one or more of these auxiliary rests 6, each is rigid with a slender shaft 10 rotatably supported in bearings 11 within the hollow bar or tube 12. As shown in Figs. 1 and 3, each said shaft is formed with an arm 13 at one end for the support of a rest 6, while its opposite end is provided with a horizontal arm 14 projecting out through a suitable opening 15 in the face of the hollow bar 12. Each arm 14 has depending therefrom a vertical post 16 whose lower extremity is immediately above the

inner end of a key 17. By depressing the outer end of such a key, the post associated therewith rises and the corresponding rest 6 is swung away from engagement with the heads of the hammers otherwise supported thereby; a spring 18 pressing downward upon the upper end of said post, serving to normally retain its rest in the position shown in Fig. 3.

The post 16 at the extreme left hand being connected with the rest 6 to the left of the others; the second post from the left being connected with the second rest from the left, and so on, the operation of any particular rest is dependent upon the depression of a corresponding key. Consequently if at a particular instant the melody line 3 is within the space E on the indicator, the operator depresses the key E (Fig. 1) and thereby retracts the rest 6 corresponding to such position, and permits the hammers full swing which were supported by such rest. Hence as the melody line passes from space to space on the indicator, the corresponding keys are depressed, and the appropriate rests withdrawn to allow the melody to loudly sound, while all the other notes remain subdued. If the operator wishes both melody and harmony to be equally loud, he presses upon all five of the keys controlling the rests 6, while if he wishes the harmony to be strong and the melody subdued, he depresses all said keys except that corresponding to the space traversed by the melody line. By varying the extent to which said keys are depressed, he secures different shades of expression; it being evident that a swing of a rest 6 but partially from its normal position permits of but a slight increase in the vigor of its hammers' strokes.

It is, of course, essential that the rest-operating keys shall be mute, in order that discords shall not be produced by their manipulation. To render such keys thus mute, we provide the tilting plate 21 mounted upon the rocking shaft 22 and operated by means of the arm 23 rigid with such shaft, and the lever 24 intermediately pivoted to a suitable support and having a pin 25 engaging a slot 26 in said arm. By pulling up upon the thumb-piece 27, the rear edge of said plate is elevated and the action raised thereby to a point to enable the keys controlling the rests to be freely manipulated without affecting their hammers, as shown in Fig. 3. This plate 21 serves another important function: When it is desired to put this attachment out of control in order that the piano-player shall operate with equal loudness on all the strings of the piano, said plate is tilted with its front edge uppermost. This puts the action of the five keys again into operative condition, and at the same time elevates all the posts 16 sufficiently to swing all the rests away from possible interference with the hammers.

For properly supporting the shafts 10, we prefer to mount them in the bi-part bearings 11 each of which consists of two fluted blocks as shown in Fig. 5. Each block contains a series of semi-circular recesses which when put face to face form circular bearings. This is necessary because of the fact of each shaft being formed with an arm at each end and so incapable of being introduced longitudinally into suitable bearings. By placing the five shafts into a proper number of the bearing-blocks 11 and then bending the sheet metal about the same to form the tubular bar 12, with the arms 14 protruding through the slots made therefor in one face of such bar, as shown in Fig. 1, and fastening such parts together, as by a small bolt indicated in Fig. 5, said shafts are securely supported.

What we claim as our invention and for which we desire Letters Patent is as follows, to wit;—

1. The combination with a piano provided with the usual strings, hammers, action and keyboard, of an automatic player therefor, means for reducing the effect of said hammers' blows, said means being divided into a moderate number of independent sections, and means whereby the depression of any one of an equal number of keys of said keyboard will affect a corresponding section of said blow-reducing means.

2. The combination with a piano constructed in the customary manner and hence having the usual strings, hammers, action and keyboard, of an automatic player therefor, means for reducing the effect of said hammers' blows, and means in contact with a limited number of the seldom used keys of said keyboard whereby the depression of any one such key will affect a limited section of said blow-reducing means.

3. The combination with a musical instrument having a keyboard, and an automatic player therefor, of means connected with certain seldom-used keys of the keyboard and operated thereby at will for affecting the action of the player; said means being provided with means to disconnect the said keys from their normal functions.

4. The combination with a piano having the customary strings, hammers, action and keyboard, of an automatic player therefor, means normally acting to reduce the effect of the hammers' blows, and keys located in the said keyboard and similar to the keys in the latter for temporarily withdrawing any one of several sections of said reducing means for the purpose of accenting the melody in the music being played.

5. The combination with a musical instrument having the usual manual, and an auto-

matic player having a perforated music sheet, of an indicator fixed to the instrument in the path of the music sheet and having its face divided into a plurality of spaces each bearing a letter of the musical scale, an equal number of devices for reducing the effect of the hammers' blows each affecting a group of notes in the instrument, and means connected with certain keys of the manual for operating the respective devices; each key corresponding in name to a character on said spaces.

6. The combination with a piano having the usual hammers, strings and manual, and an automatic player having a perforated music sheet, of an indicator fixed to the piano in the path of the music sheet, a plurality of rock shafts each having an arm descending rigidly therefrom, a hammer rest carried by each arm, arms horizontally projecting from said shafts, and posts descending from the horizontal arms into contact with the inner sections of an equal number of the keys of said manual.

7. The combination with a piano having the usual hammers, strings and manual, and an automatic player having a perforated music sheet, of an indicator fixed to the piano in the path of the music sheet, a plurality of hammer rests each affecting a group of hammers, an equal number of vertically movable posts each controlling one of said rests, an equal number of keys supporting said posts, and means operative at will for disconnecting said keys from said posts.

8. The combination with a piano having the usual hammers, action, strings and manual, and an automatic player having a perforated music sheet, of a plurality of hammer rests each affecting a group of hammers, an equal number of vertically movable posts each controlling one of said rests, an equal number of keys supporting said posts, and means operative at will for disconnecting said keys from their actions, or for elevating said posts out of engagement with said keys and restoring such keys and actions to their normal conditions.

9. The combination with a piano having the usual hammers, action, strings and manual, and an automatic player having a perforated music sheet, of a plurality of hammer rests each affecting a group of hammers, an equal number of vertically movable posts each controlling one of said rests, an equal number of keys supporting said posts, a rock-shaft, a plate fixed to said shaft and penetrated by said posts, adjustable stops on said posts supporting the latter on said plate, and means controlling said shaft.

10. The combination with a piano having the usual hammers, action, strings and manual, and an automatic player having a perforated music sheet, of a plurality of hammer rests, an equal number of vertically movable posts each controlling one of said rests, a rock-shaft, a plate fixed thereto, and means controlling said shaft; said plate being adapted when rocked in one direction to raise the posts out of engagement with their keys, and when rocked in the other direction to permit such engagement but to put the actions belonging to such keys out of engagement therewith.

In testimony that we claim the foregoing invention, we have hereunto set our hands this 18th day of June, 1908.

HARRY L. HENTZ.
JOSEPH W. VINAL.

Witnesses:
A. B. UPHAM,
WARREN N. AKERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."