



# UNITED STATES PATENT OFFICE.

WALTER CRIPPEN, OF NEW YORK, N. Y., ASSIGNOR TO WILCOX & WHITE COMPANY, OF MERIDEN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## MUSIC-SHEET.

No. 803,153.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed June 5, 1905. Serial No. 263,711.

*To all whom it may concern:*

Be it known that I, WALTER CRIPPEN, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Music-Sheets, of which the following, together with the accompanying drawing, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

My present invention relates to the construction of perforated music-sheets for use in autopneumatic music-playing instruments, such as autopneumatic piano-players and other instruments of that class and in which the scale or range of pneumatic operators or action mechanism is provided with a "break" or separated into divisions, as between the bass and treble or at other positions in the scale, and the two (or more) divisions each provided with separate accentuation or expression producing appliances for varying the pneumatic potential or air-tension pertaining to the respective divisions.

The object of my invention is to so construct a perforated music-sheet that artistic effects similar to those introduced in personal manipulation by individual players can be produced automatically in mechanical pneumatic piano-players.

Another object is to provide a music-sheet adapted for the automatic control of the pneumatic music-playing actions and the several accentuation or expression mechanisms in the manner hereinafter explained.

To this end my invention consists in a perforated music-sheet having the peculiar features of construction illustrated in the drawing and defined in the claims.

The accompanying drawing represents a portion of a music-sheet embodying the features of my invention and adjacent thereto the face of a tracker on which such a music-sheet may be employed. It will be understood that in practice the music-sheet may be of any required width and embrace a scale of any desired number of note-perforations to conform to the scale of the particular instrument whereon such music-sheet is desired to be used. The present illustration is, however, somewhat narrowed to come within the limit of the drawing-sheet.

The peculiar and novel features of my in-

vention consist in providing a mechanical music-sheet with the perforations for certain accentive, selected, or melody notes cut therein in partial advance of the normal alinement of the accompaniment-notes and the combination therewith of an accent-controlling perforation positioned in advance of the selected note or notes to which the accent pertains; also, in combining therewith a pedal-controlling perforation or group of holes positioned or cut a step to the rearward of the normal line of note-perforations, such holes terminating with a wide bridge or unperforated portion for a release of the pedal devices before reaching the normal line of the next succeeding group of note-perforations.

Referring to the drawing, M indicates the music sheet or roll, which may be of any required length and have the note-perforations cut therein in accordance with any musical composition as in any instance desired.

T indicates the face of a tracker adapted for coöperation with a music-sheet such as herein described.

I denotes the line of the break or a division in the scale corresponding to the position of the dividing means that separates the accentuation-divisions of the pneumatic playing actions in the particular instrument for which the sheet is intended, in the present instance comprising a bass portion or division L and a treble portion or division R. More divisions may be in some instances employed, if required, the nature and mode of action being similar to that in the two divisions here described. A line, as I, for indicating on a music-sheet the relative position of the break or division is not in itself of my invention, but is herein shown for purposes of illustration.

The numerals 1 to 10 indicate successive groups of perforations that in a manner pertain to each other or act together in governing tones and expression effects.

The transverse dotted lines  $n'$   $n^2$   $n^3$ , &c., shown on the drawing, (but which are not on the sheet in practice,) represent the normal lines at which the leading end of the ordinary note-perforations in any of the several groups of notes would reach and open the tracker-orifices as the music-sheet moves over the same while in operation. The direction in which the music-sheet moves is indicated by the arrow.



The letters *m* indicate the melody note or notes selected for accent, and *a* the accompaniment-notes, each of which class of notes may at times occur at either side of the break or in the bass or treble divisions.

The music-sheet is provided near its edges with a series of side perforations, as indicated by the lines 1<sup>m</sup> 2<sup>m</sup> at the left and 3<sup>m</sup> at the right of the sheet, for controlling the special ducts 1, 2, and 3 in the tracker-face. The series 1<sup>m</sup> and 2<sup>m</sup> are accent-perforations for the bass and treble divisions and the series 3<sup>m</sup> for governing pedal operations.

In accordance with my invention the note selected for accentuation is positioned or cut in the sheet with its leading end *e* advanced beyond the normal alinement of the accompaniment note perforation pertaining to the group of notes in which the particular selected note or notes occur, and for operation in combination therewith I provide a perforation in the row of accent-perforations corresponding with the respective division in which such selected note is sounded, said accent-opening being positioned in advance of the advanced end of the perforation of the note or notes to be accented, as indicated by the dotted parallel lines at *f*.

Where the selected notes occur at the left or bass side of the break I, the accent-perforation therefor is formed in the series 1<sup>m</sup> and governs the tracker-duct 1, that communicates with the accentuation-controlling mechanism for the bass-division of the instrument. Where the selected notes occur at the right or treble side of the break, then the accent-perforation therefor is formed in the series 2<sup>m</sup> and governs the tracker-duct 2, that communicates with the accentuation-controlling mechanism for the treble-division of the instrument. In case there are more than two divisions of the instrument then the music-sheet may be provided with additional series of accent-perforations formed therein in the same advanced relation as above specified.

When melody or selected notes occur simultaneously at both the bass and treble sides of the break, then a plurality of accent-perforations are formed in the sheet at the same alinement position, one being in the series 1<sup>m</sup> and the other in the series 2<sup>m</sup>, as shown for the groups 5 and 10.

The accent-perforations are each preferably, as shown, formed as a single round hole; but in some instances the shape of the hole may be modified or slightly elongated, if desired. The extent to which these perforations are advanced is best a dimension equaling from one-half to a whole width of a single opening, more or less.

In addition to accent-perforations the music-sheet is also provided with a series 3<sup>m</sup> of perforations that coöperate with a tracker-duct 3 for governing pedal-controlling mechanism, whereby the sustaining-pedal of the piano

is actuated for "sustanuto" effects. These perforations I arrange in groups or rows of adjacent small holes of greater or less extent, according to the length of the notes to which they relate, and I position the leading end of the opening pertaining to each group a step or short distance, as at *r*, rearward from the normal line of the group of notes to which the respective pedal-perforation pertains. In each group the perforation or row of holes terminates so as to leave a broad bridge or imperforate portion *s* before the commencement of the opening for the next succeeding group of notes, so that the pedal devices will be released before the succeeding group of notes comes into acting position. The correct use of the pedal is governed by the position and number of holes in the respective groups.

In practice the successive groupings of the notes conform to the particular musical composition represented; but the constructive principles and combinations involved are substantially as herein specified. As illustrated in the present drawing, group 1 shows the note-perforations therein arranged to approach the tracker simultaneously. The melody or selected note *m* is in the treble-division R. It is accented by the accent-perforation *a*, positioned in the series line 2<sup>m</sup> and forward of the normal line *n'*. The pedal-perforation *d* is on series line 3<sup>m</sup>, the distance of space *r* following the normal line. Group 2 shows a set of note-perforations without accent or pedal perforations. Group 3 shows the selected note in the treble advanced, as at *e*, beyond the normal *n*<sup>3</sup>, the accent-perforation *a*<sup>3</sup> advanced, and the pedal-perforations *d*<sup>3</sup> rearward of the line and of short duration. Group 4 shows the melody or selected note *m* as occurring in the bass-division L. Said note is advanced beyond the normal line *n*<sup>4</sup>, and an accent-perforation *b* is provided in advanced position on the series line 1<sup>m</sup>, the pedal-perforations being as shown at *d*<sup>4</sup>. Group 5 shows a group having selected advanced notes *m* in both bass and treble divisions. Such notes are advanced beyond the line *n*<sup>5</sup>, and two accent-perforations *b*<sup>5</sup> and *a*<sup>5</sup> are combined therewith, one on each of the series lines 1<sup>m</sup> and 2<sup>m</sup> and advanced, as at *f*, and the pedal-perforations are rearward of the normal alinement, as at *d*<sup>5</sup>. Group 6 is similar to group 3, but is without pedal-perforations. It has accent-perforations *a*<sup>6</sup>. Group 7 is similar to group 2, but with pedal-perforations, as *d*<sup>7</sup>, and no accent. Group 8 is similar to group 3, but with the melody or selected note *m* advanced in a less degree. Group 9 is similar to group 3, but with the selected note *m* advanced in greater degree. Group 10 shows a group in which all of the notes are accented, in which case they are necessarily all cut to approach the tracker at the same instant. Advanced accent-perforations *b*<sup>10</sup> and *a*<sup>10</sup> are provided



for each division L and R, and a row of pedal-perforations  $d^{10}$  rearward of the line  $n^{10}$  and extending to the finale of the said notes.

By cutting the selected or melody note in advance of its accompaniment the sound thereof is established before the accompaniment sound takes its primary effect, but in a slight degree only, so that it appeals to the ear as a more expressive effect and not as a perceptible difference in tempo, while the advanced accent serves to pick out the selected tones in an efficacious and brilliant manner, and the pedal-perforations in their following order control the pedal action for properly sustaining and enriching the effects and utilizing the ethereal sounds that rise from the strings when they vibrate sympathetically.

By means of the invention shown and described when employed in connection with a suitable music-playing instrument having pneumatically-controlled accentuation and pedal-actuating devices an exact interpretation or rendition may be produced wholly automatically of the style that some particular artist or musician has played the composition, reproducing such peculiarities and characteristics of expression as are inherent to the individual personal performance, since the peculiar arrangement, positioning, and combination of the selected note-perforations, accent-perforations, and pedal-perforation in practical effect picks out the melody or selected single notes, accenting, sustaining, and bringing out in sharper outline the power and gradations of tones and expressively executing all in the way the composer intended.

It will be understood that I do not herein claim, broadly, the idea of providing a music-sheet with accent or pedal perforations irrespective of its construction.

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

1. A perforated music-sheet having the selected or melody note perforation cut in partial advance of the accompaniment-note perforations; in combination with an accent-perforation positioned in advance of the normal tracker alinement for said accompaniment-note perforations, substantially as set forth.

2. A music-sheet having side perforations, for accent, cut or positioned therein in advance of the normal alinement of the note-perforations to which the accent pertains, as set forth.

3. In a mechanical music-sheet provided with groups of note-perforations, the perforations for selected, accentuable or melody notes positioned therein with their leading end advanced beyond the normal alinement of the accompaniment-note perforations pertaining to the same group; in combination with an accent-perforation therefor positioned in ad-

vance of the advanced end of said selected-note perforation.

4. In a mechanical music-sheet, a system of perforations comprising a selected accentuable or melody note perforation having its leading end advanced in relation to a line coincident with the normal transverse alinement of accompaniment-notes, an advanced accent-perforation positioned forward of said line, and a pedal-governing perforation positioned rearward of said line, all arranged for operating in the manner and for the purposes set forth.

5. In a mechanical music-sheet for automatic musical instruments having a "break" or plurality of divisions in their action; a group of note-perforations comprising accompaniment and melody note perforations with selected or accentuable notes occurring at each side of the break or division line, the selected-note perforations cut with their leading ends in advance of the normal alinement of the accompaniment-note perforations pertaining to the respective group, and a plurality of accent-perforations for severally controlling accent in the respective separate divisions.

6. In a mechanical music-sheet, a series of note-perforations having certain perforations for selected accentuable notes positioned for acting slightly in advance of their coacting accompaniment-note perforations; in combination with separate series of accent-perforations for the treble and bass divisions, the accent-perforations disposed at an advanced position and a series of pedal-perforations in which the respective perforations are positioned a step or space rearward of the normal line of the note-perforations pertaining to the group.

7. A music-sheet comprising bass and treble divisions, a dividing-mark thereon, a series of groups of note-perforations comprising melody and accompaniment notes, the selected accentuable note perforations positioned with their leading ends in advance of the normal transverse alinement of the accompaniment-note perforations, said sheet provided near one edge with two series of accent-perforations in which the perforations are positioned in advance of the normal note alinement, and having near its other edge a series of pedal-perforations in which the perforations are positioned rearward of the normal note alinement, said pedal-perforations terminating with an imperforate bridge before reaching the normal line of the next succeeding group.

Witness my hand this 2d day of June, 1905.

WALTER CRIPPEN.

Witnesses:

STANLEY B. WHITE,  
FRANK C. WHITE.