P. J. MEAHL.

METHOD OF MAKING PERFORATED MUSIC SHEETS.

APPLICATION FILED AUG. 18, 1914.

1,166,618. Patented Jan. 4, 1916.

Fig. 1.

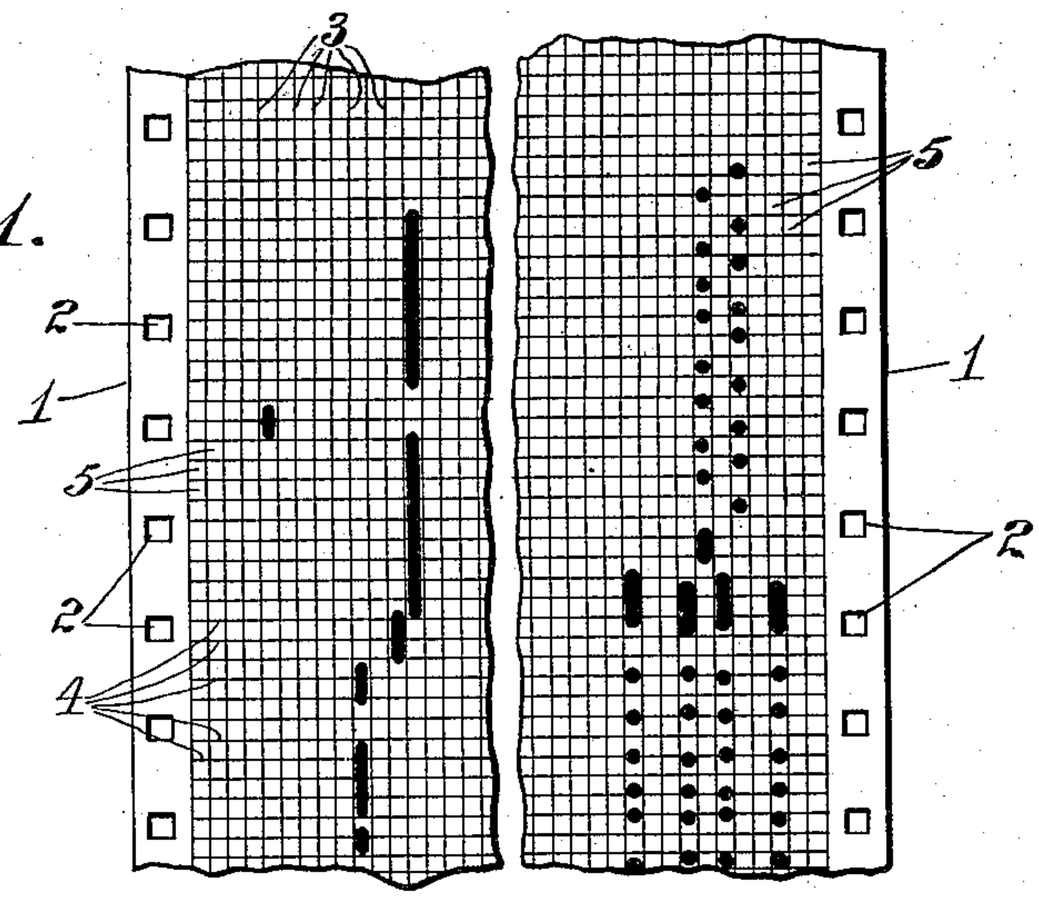
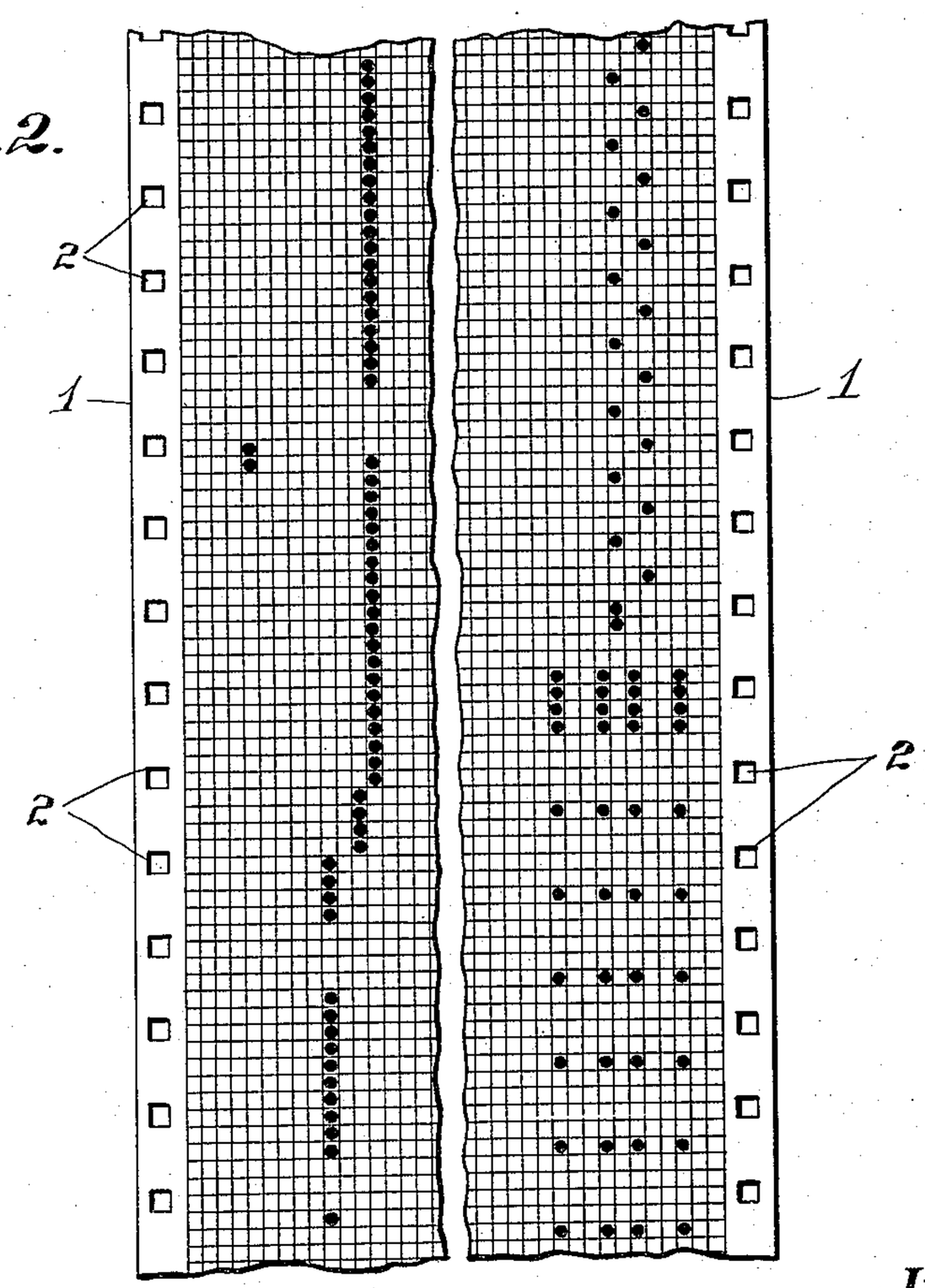


Fig. 2.



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METHOD OF MAKING PERFORATED MUSIC-SHEETS.

1,166,618. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed August 18, 1914. Serial No. 857,331.

To all whom it may concern:

Be it known that I, PHILIP J. MEAHL, a citizen of the United States, and a resident of Summit, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in the Method of Making Perforated Music-Sheets, of which the following is a specification.

This invention relates to certain new and useful improvements in the method of making perforated music sheets, particularly to the method of making a master sheet for perforating such sheet in quantities for the trade, which master sheet contains a record of manual playing, the perforations of which master sheet are so adjusted or rectified so as to adapt the use of such master sheet in a mechanically controlled machine for making copies of the same for practical use, all of which will be described in detail hereinafter.

In the accompanying drawings in which like letters of reference indicate like parts in all the figures:—Figure 1 is a face view of the record sheet made automatically by manual playing and by an automatic recording machine, parts being broken away. Fig. 2 is a similar view of a copy of the said sheet as rectified, parts being broken away.

In making the master sheet according to my new and improved method, a musical composition is first played by a skilled pianist on a piano which is connected with an automatic recording machine which contains mechanisms for actually recording or perforating on a moving sheet every key stroke made by the pianist, which record marks correspond to the length of time a key is held depressed, so as to produce a correct visual record of each key depressed and of the time it has remained depressed. This record is made upon a sheet of paper 1 which is provided at its marginal edge with openings 2 into which teeth or cogs of sprockets pass so that the sheet 1 is fed uniformly and always in a straight line without any possibility of lateral divergence whatever and without slipping. This sheet is preferably provided with a series of longitudinal parallel lines 3 forming longitudinal divisions, each of which divisions correspond to one of the 88 punches of the recording machine, it being assumed that the pianist shall be able to use any one of the keys of the piano key board. The sheet is likewise preferably provided with transverse equidistant lines 4, which lines with the longitudinal lines form squares 5 in which the punchings are to be made. The punchings are formed between the longitudinal lines 3 as the paper cannot diverge laterally and no slipping is possible on account of the engagement of the paper with the sprocket teeth but it is practically impossible for a human being to strike the keys with such absolute precision that the punchings will be exactly in the correct positions.

Pianists have more or less idiosyncrasies and peculiarities in touch and so forth, which they use for the purpose of bringing out the expression and their interpretation of the composition and furthermore it is almost impossible for the pianists, especially when playing rapidly to strike the successive notes of a trill or a rapid succession of the same note with such regularity that the punches will appear in the correct positions. It will be found in practice that in such an automatically produced record of manual playing, the punchings representing a series of notes struck in succession, will not be the same distance apart and there will be considerable variation. This is absolutely unavoidable, but such a sheet cannot be used for the mechanical reproduction of copies because the machines for reproducing such record or making copies in quantity are purely mechanical and are dependent upon having the individual perforations or beginnings of slots in the master sheet spaced with exactness in accordance with the strokes of the means for operating the punches in the duplicating machine and because such duplicating machines are provided with selector devices which make a predetermined series of strokes per unit of time and the selectors can only properly select if the paper is moved in exact accordance with the strokes of the selector mechanism and the perforations have the proper positions in relation to the feed of the master sheet. The record marks made automatically by the piano player have no fixed relation whatever to the number of steps or strokes of the mechanically operated punch controlling or selecting means of a mechanically operating duplicating machine for producing copies of such perforated sheet and unless the individual perforations or beginnings of slots in the master sheet have

this fixed relation to the steps of the mechanically operated perforating machine, such master sheet cannot be used successfully on such reproducing machine. Therefore, after the pianist has produced the record of his manual playing in the manner that I have described and which I have indicated in Fig. 1, a skilled person makes the necessary corrections or transpositions or changes so that the record marks or punchings are in proper places and the bridges between the note slots in alinement will be of the proper size. For example, for an eighty-eight note machine, each cut made by a punch is from one-twenty-seventh to one-thirty-second of an inch. The smallest bridge of paper permissible in the completed sheet is three-sixteenths of an inch. In order to form such bridges in the completed sheet to be used by the player, four or five cuts of the punches must be omitted for a bridge. The skilled person correcting this manual record, transposes the punchings corresponding to the beginning or end of a note slot or single punchings in their relation to the squares 5 when they have not been cut out in the exact proper position by the automatic recorder, the corrected or adjusted sheet being shown for example in Fig. 2. Such corrected sheet however cannot be used as a master sheet in a machine for making the commercial perforated note sheets because it is on too small a scale and therefore I pass this automatically made and subsequently corrected manual record sheet shown in Fig. 2, through a special perforating machine having mechanically controlled selecting means, which produces a copy on a larger scale and this enlarged copy of the adjusted and corrected automatically made record sheet of the manual playing is then used in an ordinary purely mechanical perforating machine of the well known type, used for making any number of commercial copies of commercial perforated music sheets, such as are used in the various automatic piano players now on the market, which reproducing means has a mechanically operated punch controlling or selecting device operated at regular intervals for each time unit.

Having described my invention what I claim as new and desire to secure by Letters Patent is:—

1. The method of making copies of automatically recorded music sheets for automatic musical instruments, consisting in producing automatically a record of manual playing on a key instrument; manually making corrections on the automatically produced record sheet as are required for proper bridges, sustenuto and the elimination of false notes; making a copy of the so corrected sheet so as to give the beginnings of the note slots the proper relation to the steps of a mechanical reproducing machine having step by step selectors and a step by step feed and using the so corrected sheet as a master sheet in a mechanically or electrically operating duplicating machine having step by step selectors and a step by step feed to obtain an enlarged copy of the original sheet and using this sheet just produced as a master sheet in a mechanically or electrically operating duplicating machine for making sheets commercially, substantially as set forth.

2. The method of making copies of automatically recorded music sheets for automatic musical instruments, consisting in producing automatically a record of manual playing on a key instrument; then correcting and adjusting the positions of those record marks thus produced requiring correction or change as to their position in the direction of the length of the sheet or the length of such record marks so that said record marks will coincide with the positions which they must have in order to enable them to control the operations of punches in a machine having mechanical punch controlling means which are operated at regular intervals in a unit of time and have a fixed relation to the steps for the feed of the paper; and then making an enlargement of the so adjusted or corrected record and finally using this enlarged copy of the record as a master sheet in a perforating machine having a mechanically operated punch controlling or selecting means, which operates a definite number of times in each time unit and for a determined feed of the paper, substantially as set forth.

Signed at New York city, in the county of New York and State of New York this 28th day of July, A. D. 1914.

PHILIP J. MEAHL.

Witnesses:
OSCAR F. GUNZ,
PAUL H. FRANKE.