F. H. MOWBRAY.

PERFORATED TUNE SHEET FOR MECHANICAL PIANO PLAYERS AND THE LIKE.

APPLICATION FILED JULY 12, 1915.

1,281,632.

Patented Oct. 15, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

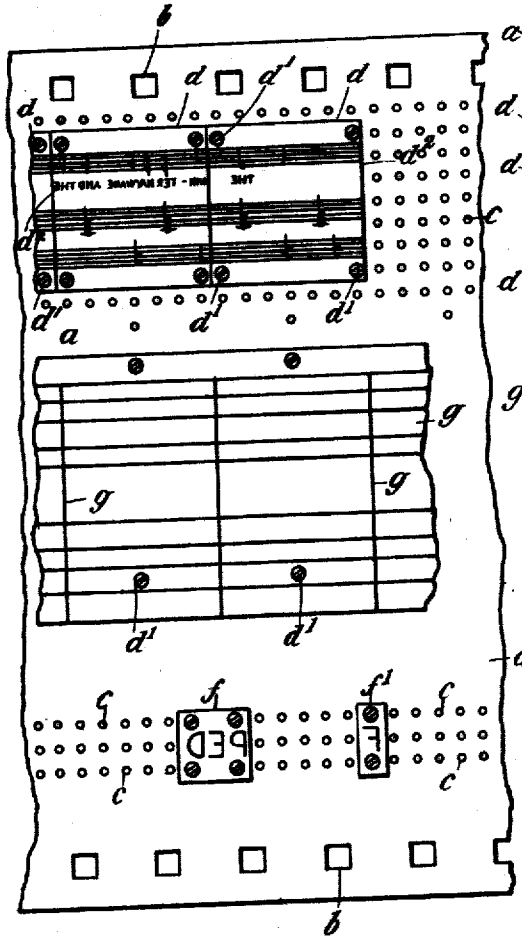
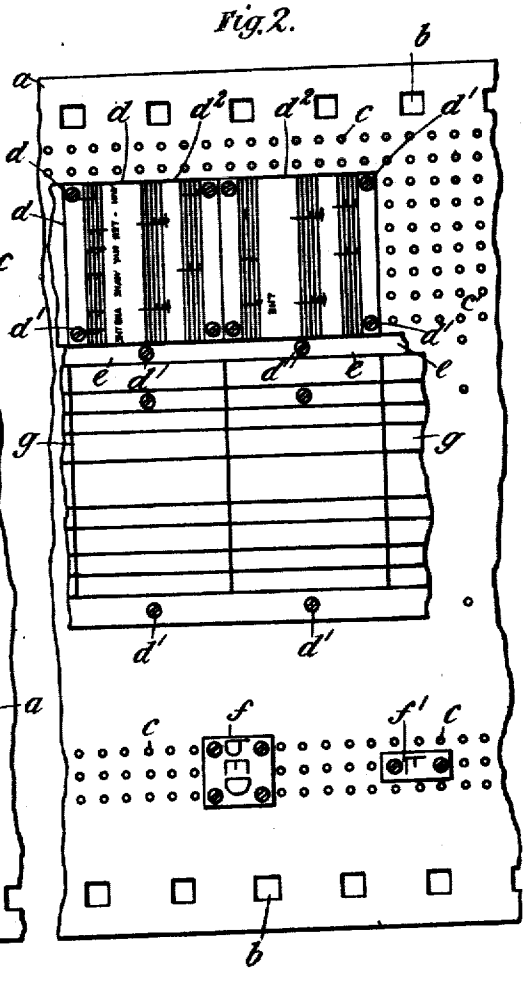


Fig. 2.



Witnesses:
S. M. Stuckey
C. H. Fesler

Inventor:
Frank H. Mowbray
By Munn & Co
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

F. H. MOWBRAY.

PERFORATED TUNE SHEET FOR MECHANICAL PIANO PLAYERS AND THE LIKE.

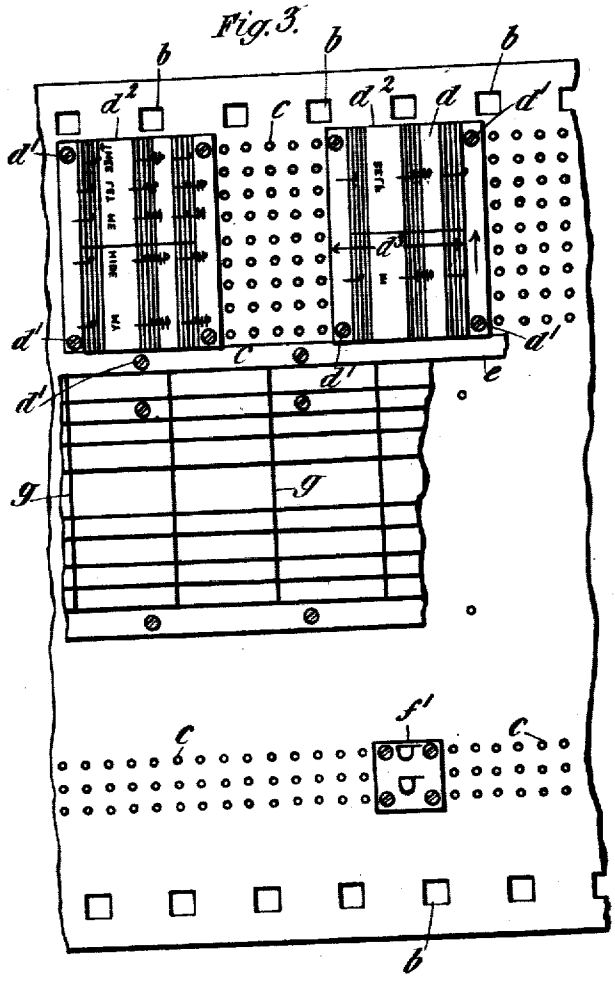
APPLICATION FILED JULY 12, 1915.

1,281,632.

Patented Oct. 15, 1918.

2 SHEETS—SHEET 2.

Fig. 3.



Witnesses:
B. M. Stucker
C. N. Fesler

Inventor:
Frank H. Mowbray
By Lyon & Lyon
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANK HERBERT MOWBRAY, OF MAIDENHEAD, ENGLAND, ASSIGNOR TO THE ORCHESTRELLE COMPANY, OF LONDON, ENGLAND.

PERFORATED TUNE-SHEET FOR MECHANICAL PIANO-PLAYERS AND THE LIKE.

1,281,632. Specification of Letters Patent. Patented Oct. 15, 1918.

Application filed July 12, 1915. Serial No. 39,391.

To all whom it may concern:

Be it known that I, FRANK HERBERT MOWBRAY, a subject of the King of Great Britain, residing at Norfolk Lodge, Oldfield Road, Maidenhead, in the county of Berks, England, have invented certain new and useful Improvements in and Relating to Perforated Tune-Sheets for Mechanical Piano-Players and the like, of which the following is a specification.

This invention relates to perforated tune sheets for mechanical piano players and the like which sheets are adapted to be used with instruments having either vertical or horizontal tracker bars and the respective surfaces of which bear stave lines key and time signatures, notes and other music characters, expression marks, words and the like pertaining to the composition to be performed, so arranged that they can be read by the performer when the sheet is used on an instrument provided with either type of tracker bar. The music characters, words and markings on tune sheets of this kind have heretofore been printed by means of two independent sets of printing plates, that is to say, one set for the vertical and another set for the horizontal arrangement and such printing operations have rendered the production of the tune sheets extremely expensive.

According to this invention the cost of production is considerably reduced by printing the stave lines, key and time signatures, notes and other music characters, expression marks, words and the like (hereinafter referred to for sake of simplicity as stave lines, notes and other characters) on both surfaces of the sheet or on either kind of sheet in proper position for being read by the performer, by one set of printing plates which are adapted to be used singly or collectively so as to produce column printing for vertical reading or continuous line printing for horizontal reading.

The printing plates may be grouped upon a continuous plate carrier or a series of plate carriers each representing a part of the length of the tune sheet, the size and arrangement of the printing plates being such that by turning each of the plates through 90 degrees the design or arrangement of the stave lines, notes and other characters is changed from that suitable for one surface of the sheet to that suitable for the other surface thereof; in other words the adjustment of the printing plates will allow of the stave lines, notes and other characters on the sheet being produced to suit either vertical or horizontal tracker bars. The printing plates which represent the stave lines, notes and other characters may be made equal in length to one bar of the music and terminal bar lines may be provided on each plate, so that they may be used singly for column printing or in conjunction with similar plates for line printing.

Only one terminal bar line may be provided for each bar on the printing plate and in this case it would be necessary to provide other plates for printing the missing bar lines when the printing plates are used for column printing. Or each bar line may be composed of two contiguous lines which for line printing would come together to form a single bar line of given thickness between contiguous bars and for column printing would constitute a separate and thinner line for each bar.

The printing plates may be of the letter press intaglio or lithographic character and they may be made of hard material such as metal or composition or of flexible material such as rubber. For sharpness of printing, economy of manufacture and facility of handling thin metal plates having the stave lines, notes and other characters in relief are preferably employed. When the width of the printing plate is greater than one bar length as may occur when the matter to be printed consists of three or more stave notation or the bar lengths of a given composition are very short, the printing plate units may be of two or more bar lengths, so as to gain sufficient space on the tune sheet to readily accommodate the plates for column printing.

In order that the said invention may be clearly understood and readily carried into effect I will proceed to describe the same more fully with reference to the accompanying drawings, in which:—

Figure 1 is a plan of a portion of a plate carrier with various printing plates screwed in position thereon for printing the side of the tune sheet which is visible to the per-

former when used on instruments fitted with vertical tracker bars.

Fig. 2 is a plan of a portion of a plate carrier with the same printing plates arranged in position for printing the side of the tune sheet which is visible to the performer when used on instruments fitted with horizontal tracker bars.

Fig. 3 is a similar view of the plate carrier and printing plates when the latter have a greater width than their bar length.

a is the plate carrier which is provided at each edge with register preserving sprocket holes *b*, and which is riddled with numerous register preserving screw holes *c*. *d d*, are the plates for printing the musical notation and words of songs and they are secured to the plate carrier *a* by means of screws *d'*. In Fig. 1 these plates are shown abutting together to form a continuous line for horizontal reading on vertical tracker bar instruments whereas in Fig. 2 the same plates are shown after having been turned through 90 degrees so as to produce column printing for vertical reading on horizontal tracker bar instruments.

The printing plates *d d* may be provided with a thin bar line at each end so that in the case of continuous line printing where the plates abut against each other the two thin lines would form a bar line of normal thickness. This arrangement however imposes an absolutely predetermined length upon each of the printing plates *d* and necessitates accurate closing together and finishing of the ends of the plates to secure an unbroken line. In view of this fact it is preferable to provide each printing plate *d* with a bar line d^2 of normal width at one end and to leave the stave lines at the other end open. This arrangement allows some latitude in the length of the printing plates and they can be cut off to the exact length necessary to fit closely together for continuous line printing. When such plates are turned through 90 degrees for vertical reading as shown in Fig. 2, supplementary printing plates *e* may be used to print the bar lines at the open ends of the stave lines. The plates *e* may be secured to the plate carrier *a* by means of screws *d'* in a similar manner to the printing plates *d*.

The plate carrier *a* is provided with another series of screw holes *c* at the edge remote from the printing plates *d*. These holes are intended for affixing other plates *f*, *f'* for printing the expression marks, annotations and the like either as shown in Fig. 1 or after having been turned through 90 degrees as shown in Fig. 2. *g g* are printing plates which may be used for printing bar lines and stave lines corresponding to and on that part of the tune sheet usually occupied by the music note perforations or playing perforations.

When the printing plates *d*, *d* have a greater width d^3 than their bar length they are made in units of two bar lengths as shown in Fig. 3. In this manner sufficient space is provided for column printing.

It is of course essential to the correct printing of each surface of the tune sheet that in both arrangements of the printing plates there should be an exact registering relation between the said plates, their corresponding plate carrier or carriers and the perforations in the tune sheet.

When hand printing plates are employed, the correct registering relation of the printing plates with the plate carrier or carriers is conveniently effected by means of the aforesaid series of screw-holes *c* which are drilled in predetermined positions by means of a suitable jig. The various screw holes *c* are so arranged that when a printing plate is turned through an angle of 90 degrees for changing from the line printing to the column printing the holes therein will register with corresponding holes *c* in the plate carrier *a*, thus maintaining the registering position of the plates.

The correct registering relation between the plate carrier *a* and the playing perforations of the tune sheet is obtained by means of the sprocket holes *b* formed at each edge of the plate carrier. Any other means may however be employed whereby registration may be effected and maintained in the printing machine. If the tune sheet is printed before perforation, registration points or marks may be produced thereon to facilitate accurate adjustment of the sheet in the perforating machine.

Various forms of plate carriers may be employed, such as an endless band of uniformly thick and flexible material, a series of metal plates jointed together to form an endless band or chain, or a series of independent plates of uniform thickness and length. In the latter case the edges of the plate carriers would preferably be provided with sprocket holes to enable them to be fed in registering sequence and relation through the printing machine.

The subdivision of the printing plates and the arrangements hereinbefore described for insuring correct registering position thereof on the plate carrier or carriers enable continuous line printing on one side of double sided tune sheets and column printing on the other side thereof, to be accomplished by one set of plates.

Similarly the same set of plates may be used for printing two distinct types of tune sheet, viz: tune sheets printed on one side only in continuous line printing for vertical tracker bar instruments and tune sheets printed on one side only in column printing for horizontal tracker bar instruments.

What I claim as my invention and desire

to secure by Letters Patent of the United States is:—

1. In a printing member for printing stave lines, notes and other characters on tune sheets, a carrier, a set of printing plates, a bar line of normal width at one end of each plate, supplementary printing plates bearing the bar lines for the other ends of the plates and means for affixing said plates to the carrier, the arrangement being such that continuous line printing or column printing can be obtained at will.

2. In a printing member for printing stave lines, notes and other characters on tune sheets, the combination of a carrier, a set of printing plates, each plate having the edges of its printing face adapted to closely engage edges of the printing faces of adjacent plates so that the plates may be placed end to end to obtain an unbroken printing surface, and means for detachably affixing said plates to the carrier to obtain continuous line printing or column printing.

3. In a printing member for printing stave lines, notes and other characters on tune sheets, the combination of a carrier, a set of printing plates, each plate having the edges of its printing face adapted to closely engage the edges of the printing faces of adjacent plates so that the plates may be placed end to end to obtain a continuous unbroken printing surface, and detachable means located wholly within the edges of the plates for affixing said plates to the carrier for obtaining continuous line printing or column printing.

4. In a printing member for printing stave lines, notes and other characters on tune sheets, the combination of a carrier riddled with screw openings, a set of printing plates, each plate having the edges of its printing face adapted to closely engage the edges of the printing faces of adjacent plates so that the plates may be placed end to end to obtain a continuous unbroken printing surface, and screws for detachably affixing said plates to the carrier to obtain continuous line printing or column printing.

5. In a printing member for printing stave lines, notes and other characters on tune sheets, the combination of a carrier riddled with screw openings, a set of printing plates, each plate having the edges of its printing face adapted to closely engage the edges of the printing faces of adjacent sheets so that the plates may be placed end to end to obtain a continuous unbroken printing surface, each of said plates also having screw holes located entirely within their edges, and screws for detachably affixing said plates to the carrier to obtain continuous line printing of column printing.

6. In a printing member for printing stave lines, notes and other characters on tune sheets, the combination of a carrier band having along one of its edges a zone riddled with a multiplicity of screw openings, a set of printing plates of one or more bar lengths upon the zone of screw openings, each plate having the edges of its printing face adapted to closely engage the edges of the printing faces of adjacent plates, the portion of the carrier riddled with screw openings being of sufficient length to receive one or more of said plates placed transversely thereof, each of said plates also having screw openings located entirely within its edges, and screws adapted to be received by said screw openings in said plates and said carrier for affixing said plates to the carrier to obtain continuous line printing or column printing.

7. In a printing member for printing stave lines, notes and other characters on tune sheets, the combination of a carrier having along each of its edges and located to either side of the space corresponding to that portion of the note sheet occupied by playing perforations, a zone riddled with a multiplicity of screw holes; means for preserving correct registering relation between the carrier and the playing perforations of the tune sheet during the printing operation; a set of printing plates of one or more bar lengths upon one of the zones of screw holes and adapted to be arranged thereon to obtain continuous line printing or column printing; a second set of plates upon the other zone of screw holes; and screws for affixing said plates to the carrier in adjusted positions.

FRANK HERBERT MOWBRAY.

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