

C. E. PETERSON.
 MUSIC SHEET GUIDING MECHANISM.
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1,326,419.

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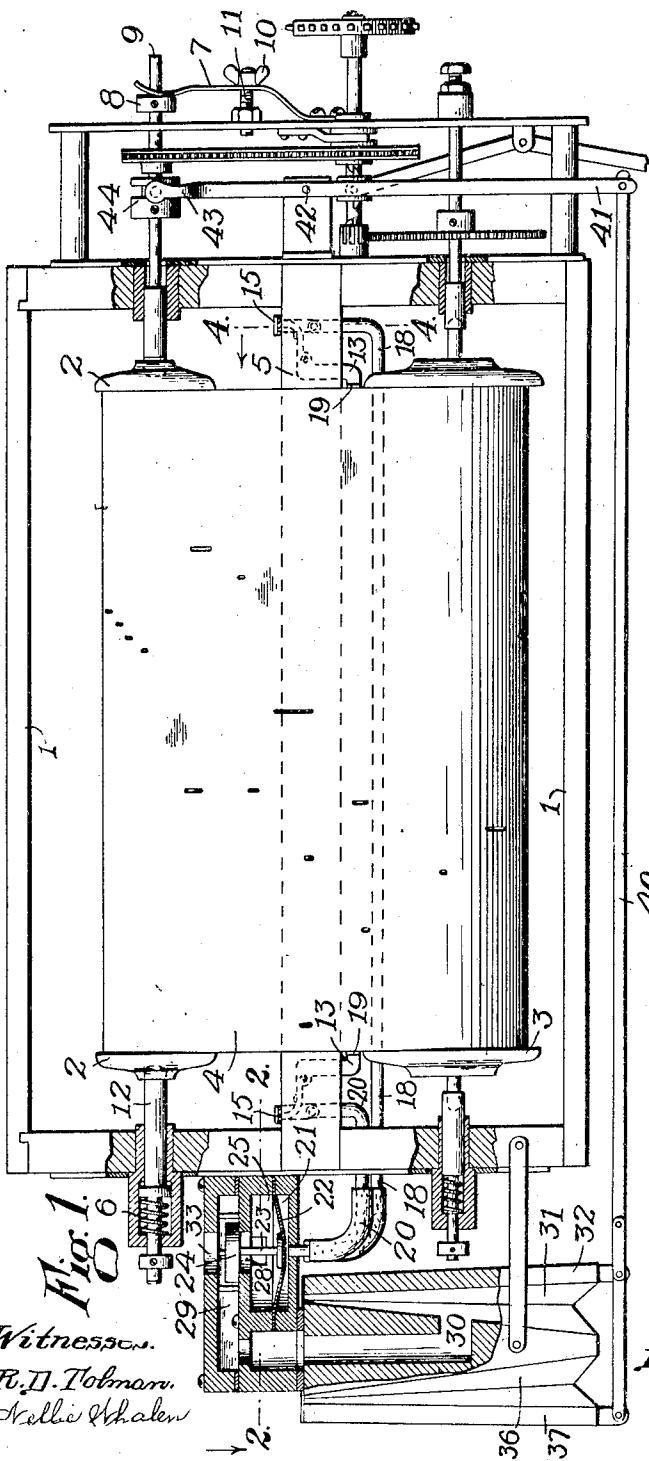


Fig. 1.

Witnesses.
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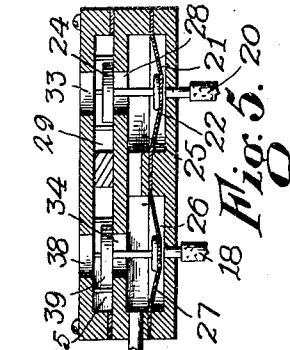


Fig. 3.

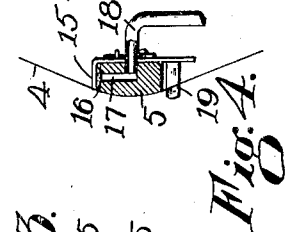


Fig. 4.

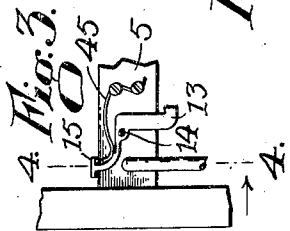


Fig. 5.

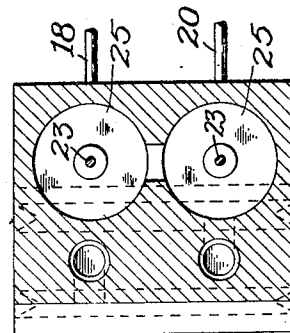


Fig. 6.

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UNITED STATES PATENT OFFICE.

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MUSIC-SHEET-GUIDING MECHANISM.

1,326,419.

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To all whom it may concern:

Be it known that I, CLAUS E. PETERSON, a citizen of the United States, residing at Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented a new and useful Improvement in Music-Sheet-Guiding Mechanism, of which the following is a specification accompanied by drawings, forming a part of the same.

This invention relates to a mechanism for controlling the movement of a perforated music sheet over the tracker bar of an automatic musical instrument, whereby the perforations of the music sheet will be maintained in proper alinement with the openings in the tracker bar, and I accomplish this result by the arrangement and combination of parts as hereinafter described, the novel features being pointed out in the appended claims.

In carrying my invention into practice, I preferably employ a tracker bar held in a fixed position between a pair of music spools, from one of which the sheet is delivered, and upon the other spool the sheet is wound by means of the usual winding mechanism in common use. These music spools are hereinafter referred to as the delivering music spool and the receiving music spool. The delivering music spool is capable of an endwise movement within certain limits and to this delivering music spool the mechanism embodying my present invention is applied.

Referring to the accompanying drawings, Figure 1 represents a front view of a music sheet controlling mechanism embodying my invention, certain parts being shown in sectional view to more clearly disclose the operation of the mechanism.

Fig. 2 is a horizontal sectional view of the pneumatic valve box, the section being shown on the plane of the broken line 2—2, Fig. 1.

Fig. 3 is a detached view showing the rear side of one end of the tracker bar.

Fig. 4 is a vertical sectional view through the tracker bar on the plane of the broken line 4—4, Fig. 3.

Fig. 5 is a sectional view of the pneumatic valve box, the section being taken upon the plane at right angles to that shown in Fig. 1.

Similar reference characters refer to similar parts throughout the different figures.

Referring to Fig. 1, 1, 1, denote a rectangular framework in which a delivering

music spool 2 and a receiving music spool 3 are journaled. During the operation of playing a piece from the perforated music sheet 4 the latter is drawn across the face of an apertured tracker bar 5 by power applied to the receiving music spool 3, in the usual and well known manner. The tracker bar 5 is of the usual construction in instruments of this class, having a series of apertures alining with the perforations in the music sheet, which in the accompanying drawings are covered by the music sheet 4. The delivering music spool 2 is free to move endwise in either direction within certain limits, its movement toward the left serving to compress a spiral spring 6 and its movement toward the right being against the tension of a blade spring 7. The blade spring 7 is supported on a fixed framework, with its free end bearing against a collar 8 on a shaft 9 having a clutch connection with the spool 2, in the usual manner. The tension of the blade spring 7 may be adjusted by means of a wing nut 10 held on a fixed stud 11. In adjusting the apparatus the tension of the spring 7 is varied until it is substantially equal to the tension of the spiral spring 6, so that in the operation of playing the instrument the delivering spool 2 is held balanced between the pressure of the two springs 6 and 7. In inserting the delivering spool 2 in the machine the spindle 12 is pushed to the left by the operator by pressing the end of the spool 2 against the spindle. The shaft 9 is limited in its following movement by means of the collar 8. The spindle 12 is pushed far enough to the left to enable the right hand end of the spool 2 to be engaged by clutching spurs carried on the inner end of the shaft 9.

Upon the rear side of the tracker bar 5 I support a bent lever 13 pivoted at 14 to the tracker bar. One arm of the bent lever 13 extends upwardly to the edge of the tracker bar where it is bent at right angles and extended over the top of the tracker bar forming a valve 15, Figs. 3 and 4.

Beneath the valve 15 I preferably attach a small piece of leather or felt 16, to more securely close the upper end of a vent hole 17 formed in the tracker bar and communicating with a pipe 18. The lower end of the bent lever 13 is provided with a prong 19 which extends forward of the tracker bar

a short distance beyond the plane of the perforated music sheet 4. The arrangement just described of the bent lever 13 and vent hole 17, is repeated at the opposite end of the tracker bar, the only difference in the arrangement being that the bent levers 13 are rights and lefts. The distance between the forwardly extended prongs 19, when the valves 15 of the levers rest upon the tracker bar, is just equal to the width of the perforated sheet. The vent hole at the right hand end of the tracker bar communicates with a pipe 20 in the same manner as the pipe 18. The pipe 20 leads to an air chamber 21 beneath a flexible diaphragm 22 on which is supported a valve stem 23 carrying a valve 24 at its upper end. The flexible diaphragm 22 separates the air chamber 21 from a vacuum chamber 25 from which the air is exhausted by any suitable means, such as a foot operated bellows in the usual manner in machines of this class.

The pipe 18 leading from the opposite end of the tracker bar communicates with an air chamber 26 separated by a flexible diaphragm 27 from the vacuum chamber 25. Bleed passages between the vacuum chambers 29 and 35 and the air chambers 21 and 26 are made by forming small holes through the diaphragms 22 and 27, Fig. 5. Said holes, however, are too small to be shown in the drawings. The vacuum chamber 25 communicates through an opening 28 with a chamber 29 which communicates through a passage 30 with a bellows 31 having a movable leaf 32. The chamber 29 communicates through an opening 33 with the outside air. The vacuum chamber 25 communicates through an opening 34 with a chamber 35, and said chamber 35 communicates through a passage, not shown, with a bellows 36 having a movable leaf 37. The chamber 35 communicates with the outside air through an opening 38. Mounted upon the diaphragm 27 is a valve 39, and in the normal position of the apparatus the valves 24 and 39 close the openings 28 and 34, cutting off the bellows 31 and 36 from the vacuum chamber 25, and opening said bellows to the outside air through the openings 33 and 38.

So long as the perforated music sheet moves in its normal path between the prongs 19, 19, the pneumatically operated parts of the mechanism remain in their normal position. If the music sheet should be unduly deflected toward the left the valve 15 of the bent lever 13 would be lifted by the rocking of the lever caused by the pressure of the edge of the music sheet against its prong 19, thereby admitting air through the pipe 18 beneath the flexible diaphragm 27, causing the valve 39 to be lifted to close the opening 38 and connect the bellows 36 with the vacuum chamber 25 through the opening 34. Similarly, if the music sheet is de-

flected toward the right, the bent lever 13 at the right hand end of the tracker bar will be rocked by the pressure of the music sheet against its prong 19, thereby admitting air through the pipe 20 to the air chamber 21, lifting the valve 24 to close the opening 33 and connect the bellows 31 with the vacuum chamber 25. The deflection of the music sheet in the slightest degree to either the right or the left will connect one or the other of the bellows 31 or 36 with the vacuum chamber, causing the bellows so connected to become collapsed. The movable leaves 32 and 37 are provided with a link connection 40 with the lower end of a lever 41 pivoted to the framework at 42, and having a forked upper end 43 engaging a grooved collar 44 carried on the shaft 9.

Whenever either of the bellows 31 or 36 is collapsed it becomes a motor to expand the movable leaf of the other bellows, and also to rock the lever 41. For example, if the music sheet should be deflected toward the left, it would rock the bent arm 13 at the left hand end of the tracker bar, admitting air through the pipe 20 to the air chamber 21, thereby lifting the valve 24 to close the opening 33 and connect the bellows 31 with the vacuum chamber 25 through the opening 28. The connection of the bellows 31 with the vacuum chamber causes a movement of the movable leaf 32 which, imparted through the link connection 40 to the pivoted lever 41, will move the delivering spool 2 toward the right. In the same manner a deflection of the music sheet toward the right will admit air through the pipe 18 to the air chamber 26 lifting the diaphragm 27 and valve 39, thereby closing the bellows 36 to the outside air and connecting it with the vacuum chamber 25. The movement of the movable leaf 37 will then rock the lever 41 to move the delivering spool 2 toward the left.

As the delivering spool is nicely balanced between the forces of the springs 6 and 7 very little power will be required to move the spool in either direction, and the rocking of either of the bent levers 13 will actuate one or the other of the bellows 31, 36. A very slight movement of either of the movable leaves 32 or 37 will be sufficient to shift the delivering spool 2 to the right or left, as the case may be, sufficiently to correct any aberration in the movement of the perforated sheet 4 over the tracker bar.

The bent levers 13 are angular in form with the prong 19 carried upon the extremity of the vertical member and the valve 15 upon the extremity of the end of a member substantially horizontal, so that a slight angular movement of the prong 19 will cause a corresponding elevation of the valve 15. The vertical member of the bent lever 13 is considerably heavier than the horizontal

member, causing the valve 15 to be normally lifted by the weight of the lever 13. The tendency of the lever to be rocked by gravity to lift the valve 15 is overcome by the positive action of a spring 45, Fig. 3. When either of the valves 15, 15, are closed, the air under pressure in the air chambers 21 and 26 is relieved by a minute perforation in the diaphragms 22 and 27, or, in lieu of such perforations other suitable restricted communications may be established between the air chambers 21 and 26, and the air exhausting mechanism, constituting the usual bleed holes, as will be well understood by persons conversant with pneumatic piano playing mechanisms.

I claim,

1. In a mechanism of the class described, an apertured tracker bar, means for moving a perforated music sheet transversely of the tracker bar, and means for maintaining a fixed relation between the moving music sheet and the openings in the tracker bar, comprising a motor bellows, a valve mechanism for controlling the action of the motor bellows and sheet actuated means for controlling the action of said valve mechanism, consisting of an air passage communicating with said valve mechanism and having an opening on the top side of said tracker bar, a lever pivoted on the rear side of the tracker bar, a horizontal extension on the upper end of said lever extending over the top of the tracker bar to close the opening of said air passage, and a horizontal extension on the lower end of said lever extending across the lower edge of said tracker bar

in contact with the edge of the music sheet as it is moved across the tracker bar, and means for rocking said lever to normally close said opening.

2. In a mechanism of the class described, a tracker bar, pneumatically controlled means for regulating the movement of a music sheet transversely of said tracker bar, comprising an air passage opening at the top of the tracker bar, an angular lever comprising a vertical section pivoted to the rear side of the tracker bar, a horizontal extension on the upper end of said vertical section forming a valve for closing said opening, a horizontal extension on the lower end of said vertical section in contact with the edge of a music sheet as it is moved over the tracker bar, and a spring applied to said lever to hold said opening normally closed.

3. In a mechanism of the class described, a music spool slidable endwise, a music sheet carried by said spool, a tracker bar, means for moving the music sheet transversely to the tracker bar, a spring applied to said spool to move it in one direction, a second spring applied to said spool to move it in the opposite direction, means for balancing the pressures of said springs, a motor for moving said spool endwise, and means controlled by the lateral deflection of a music sheet from its normal path for controlling the action of said motor.

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