

C. E. PETERSON.  
 MUSIC SHEET GUIDING MECHANISM.  
 APPLICATION FILED JAN. 22, 1919.

1,389,693.

Patented Sept. 6, 1921.

2 SHEETS—SHEET 1.

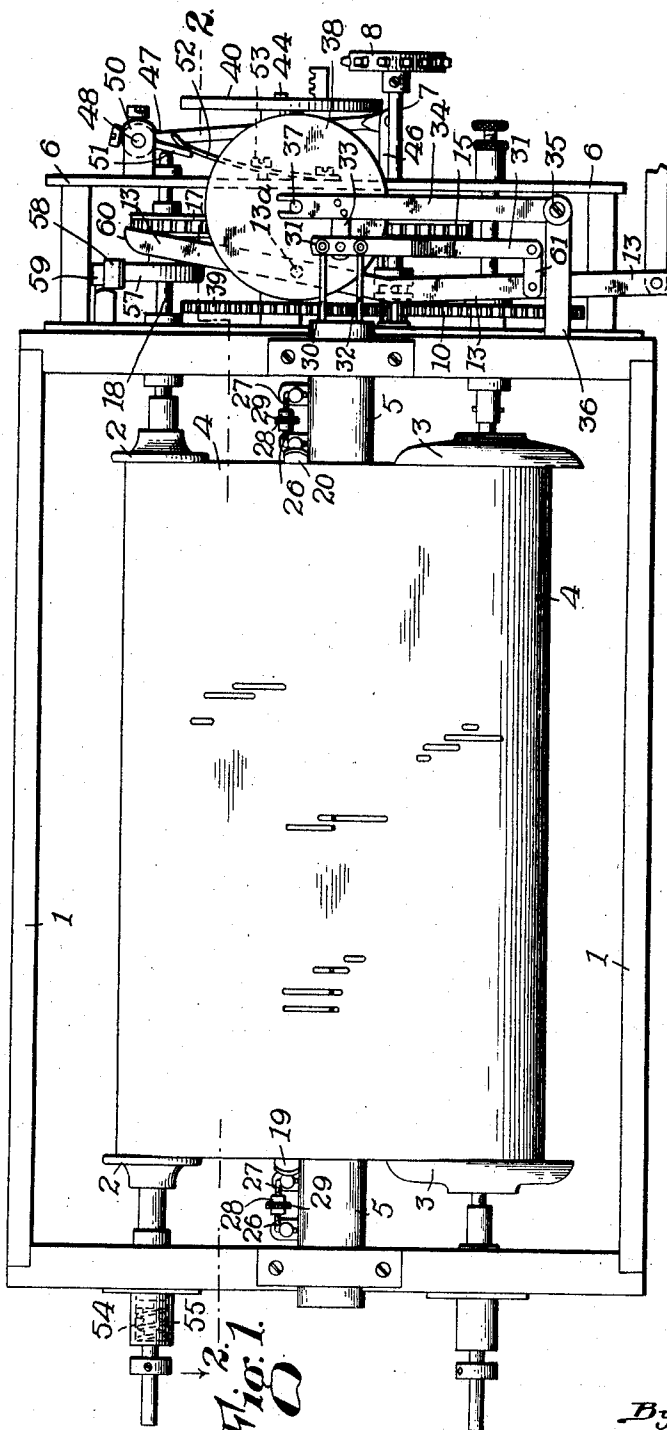


Fig. 1.

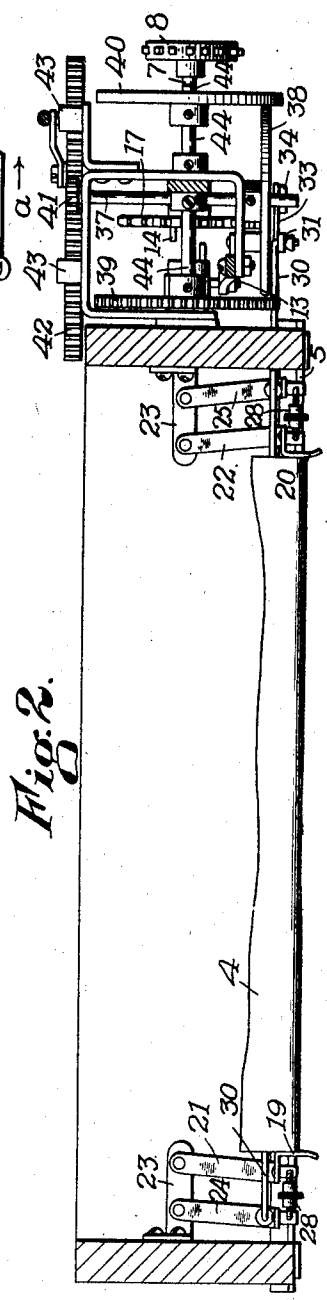


Fig. 2.

Inventor  
 C. E. Peterson  
 By Attorney  
 Geo. W. Kennedy & Co.

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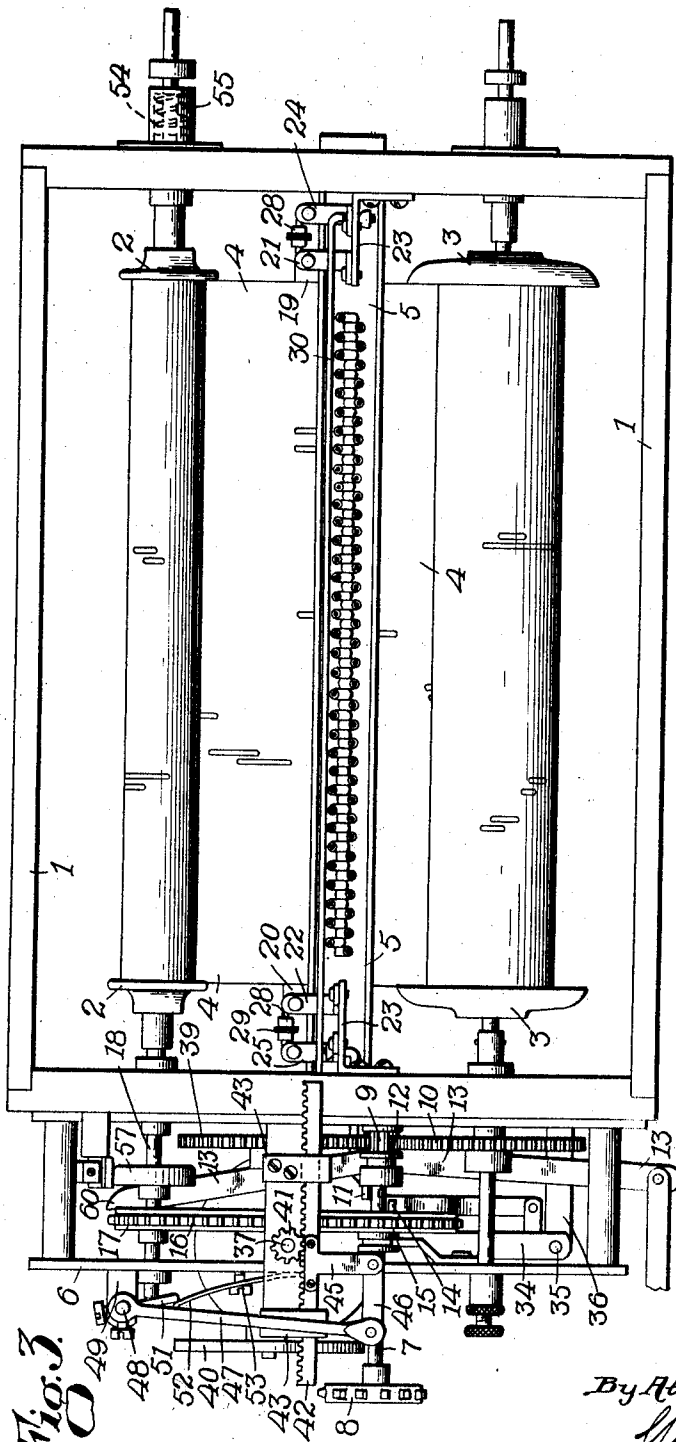


Fig. 3

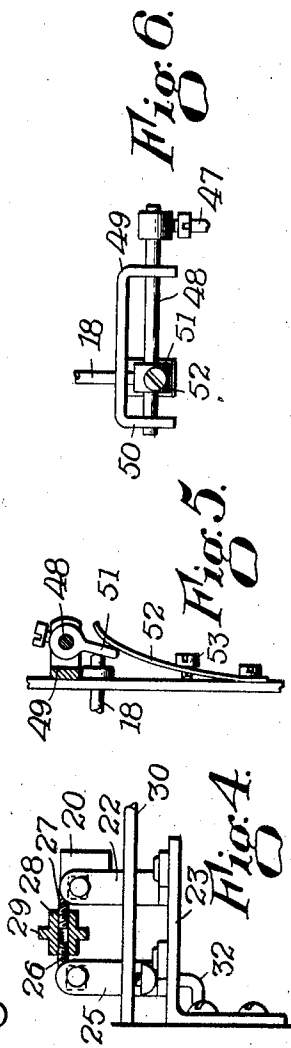


Fig. 6

Fig. 5

Fig. 4

Inventor  
C. E. Peterson  
By Attorney  
Wm. H. Kennedy Jr.

# UNITED STATES PATENT OFFICE.

CLAUS E. PETERSON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO IVERSON PIANO PLAYER COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

MUSIC-SHEET-GUIDING MECHANISM.

1,389,693.

Specification of Letters Patent. Patented Sept. 6, 1921.

Application filed January 22, 1919. Serial No. 272,506.

*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 a Music-Sheet-Guiding Mechanism, of which the following, together with the accompanying drawings, is a specification.

The object of my present invention is to provide means for controlling the movement of a perforated music sheet across the tracker bar of a player piano. This object I accomplish by means of the devices hereinafter described and illustrated in the accompanying drawings, in which—

Figure 1 represents a front view of a perforated music sheet with mechanism for moving the same across the tracker bar, and also illustrating my improved means for controlling the movement of the music sheet in order to secure at all times the perfect registration of the perforations in the music sheet with the perforations in the tracker bar.

Fig. 2 is a plan view shown in section on the plane of the broken line 2—2, Fig. 1.

Fig. 3 is a rear view of the parts shown in front view in Fig. 1.

Figs. 4, 5, and 6 are detailed detached views of certain portions of the mechanisms.

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

Referring to the accompanying drawings, 1 denotes a rectangular framework in which are journaled a delivery spool 2 and a receiving spool 3, carrying a perforated music sheet 4 which is moved across a perforated tracker bar 5 in the usual and well known manner by the rotative movement of the sheet carrying spools 2 and 3. The operating mechanism for rotating the music spools 2 and 3, while forming no part of my present invention, may be briefly described as follows:—Journaled in a framework 6, attached to the rectangular frame 1, is a driving shaft 7, carrying at one end a sprocket wheel 8 by which the shaft 7 is driven through a chain connection with a motor, not shown, in the usual and well known manner in instruments of this class. The driving shaft 7 carries upon its opposite end a pinion 9 engaging a gear 10 on the shaft of the receiving spool 3. The pinion 9 has a spline connection with the shaft 7 and the hub of the pinion carries a short stud 11. The hub

of the pinion has a peripheral groove 12 and is slidable upon the shaft 7 by means of a lever 13 carrying a stud which enters the groove 12. The lever 13 is pivoted at 13<sup>a</sup> Fig. 1, in the framework of the machine and is manually operated to slide the pinion 9 on the shaft 7 into and out of engagement with the gear 10. When the pinion 9 is moved out of engagement with the gear 10, the connection between the driving shaft and the receiving spool 3 is broken and the stud 11 is moved into engagement with a stud 14 carried in the side of a sprocket wheel 15 held from longitudinal movement on the shaft 7, but free to rotate thereon. The sprocket wheel 15 has a chain connection 16 with a similar sprocket wheel 17 on the shaft 18 of the delivery spool 2. When the pinion 9 is disengaged from the gear 10 the stud 14 is brought into the path of the stud 11 causing a rotary motion to be imparted to the sprocket wheel 15, and through the chain connection and sprocket 17 to the delivery spool 2, rotating the latter in the opposite direction from the rotation of the receiving spool 3 in order to effect the rewinding of the music sheet. All the above described mechanism is substantially like that now in common use in the spool driving mechanisms of player pianos, and its use and construction will be well understood by those familiar with the operation of player pianos. In order to control the movement of the music sheet in its passage over the perforated tracker bar and to insure the perfect registration of its perforations with the openings in the tracker bar, I have introduced mechanically operating devices which form the subject of my present improvement. Arranged immediately above the tracker bar 5 and in position to contact with the edges of the perforated music sheet 4 are two guide plates 19 and 20, Fig. 2. The plates 19 and 20 are carried on the free ends of levers 21 and 22 pivoted at their opposite ends to brackets 23 attached to the framework of the instrument. Pivoted to the brackets 23 are levers 24 and 25. The free ends of the levers 21 and 24 and 22 and 25 are connected together by an adjusting mechanism, which enables the distance between the ends of the levers to be increased or diminished, for the purpose hereinafter mentioned.

The adjusting mechanism consists of the wires 26 and 27, one of which is provided

with a right hand screwthread and the other with a left hand screwthread, said wires being engaged by a screwthreaded nut 28, preferably provided with a milled edge 29. The lever 24 is connected by a wire 30 with the upper end of a lever 31 and the lever 25 is connected by a wire 32 with the lever 31.

Midway between the connections of the wires 30 and 32 with the lever 31 the lever is pivotally connected to an arm 33 which is rigidly attached to a lever 34. The lever 34 is pivotally supported at its lower end at 35 to a fixed arm 36 projecting from the framework of the apparatus. The upper end of the lever 34 is bifurcated and incloses one end of a shaft 37.

The shaft 37 carries at one end a friction disk 38 mounted between a gear 39 and a disk 40, with its periphery spaced a short distance from each. The shaft 37 is provided at its opposite end with a pinion 41 which engages a rack 42 sliding in ways 43. The gear 39 and disk 40 are attached to a shaft 44, at right angles to the shaft 37 and immediately above it. The gear 39 is located directly over the gear 10 and, during the playing of the instrument the gear 39, as well as the gear 10 are in engagement with the pinion 9, causing the shaft 44, gear 39 and disk 40 to rotate in the opposite direction to the gear 10.

The rack 42 carries an arm 45 connected by a link 46 with an arm 47 attached to a shaft 48. The shaft 48 is journaled in brackets 49 and 50, Fig. 6, supported by the framework of the machine. The shaft 48 carries an arm 51 which bears against the end of the shaft 18 and conveys to the shaft the pressure of a blade spring 52. The blade spring 52 is supported by the framework of the apparatus and its pressure against the arm 51 may be increased or diminished by means of the adjusting screw 53, Fig. 5, in order that the pressure of the spring 52 against the shaft 18 may counterbalance the pressure of a spiral spring 54, Figs. 1 and 3, inclosed in a casing 55 and applied to force the spool 2 in opposition to the pressure of the spring 52.

The shaft 18 carries a friction wheel 57 against which a brake lever 58 is pressed by a spring 59. The brake lever 58 imparts sufficient friction to the wheel 57 to prevent the too free rotation of the spool 2 as the perforated music sheet is being drawn off. When the lever 13 is rocked by the operator to accomplish the rewinding of the music sheet, its upper and cam shaped end 60 is carried beneath the end of the brake lever, thereby lifting it from the wheel 57 and permitting the free rotation of the delivery spool 2. The lever 31 which is pivoted upon the arm 33 extends downward and rearward and is pivotally connected at its lower end by means of a link 61 with the lever 13, so that as the rewind lever 13 is moved in the direction of the arrow *a*, the lever 31 will be rocked on its pivotal connection, with the arm 33, to move the wire 30 toward the left, Fig. 1, and to move the wire 32 toward the right. The above described movement of the wires 30 and 32 through their connection with the guide plates 19 and 20 will cause each of the latter to be moved away from the edges of the music sheet. The plates 19 and 20 will therefore be moved out of contact with the music sheet during the rewinding of the latter. When the lever 13 is reversed for the playing of a selection the pinion 9 will be carried into engagement with the gear 10, thereby driving the receiving spool 3, and also with the gear 39, causing the rotation of the shaft 44 and rotating the gear 39 and disk 40 on opposite sides of the friction disk 38, and again bringing the plates 19 and 20 into their normal position in contact with the edges of the music sheet.

The operation of the apparatus during the playing of a selection is as follows:—Any deflection of the music sheet toward the left, for example, will move the guide plate 19, and through its adjustable connection with the lever 24 will draw the wire 30 toward the left, drawing the lever 34, shaft 37, and friction disk 38 into contact with the gear 39. The deflection of the music sheet toward the right will in like manner act upon the guide plate 20, moving the wire 32 toward the right, and carrying the friction disk 38 into contact with the disk 40. The disk 38 will thus be rotated in one direction by the gear 39, and in the opposite direction by the disk 40, and the rotation of the disk 38 and shaft 37 will rotate the pinion 41 and move the rack 42 to the right or left as the case may be. The movement of the rack 42 to the right or left will rock the shaft 48 to carry the arm 51 toward or away from the end of the shaft 18. If the arm 51 is moved away from the end of the shaft 18 the latter will be relieved from the pressure of the spring 52, allowing the spring 54 to move the music spool to the right, while the movement of the arm 51 in the opposite direction will crowd the music spool 2 to the left.

After the selection has been played and the lever 13 moved in the direction of the arrow *a*, Fig. 1, the shaft 44 will be disconnected from the driving mechanism and the plates 19 and 20 will be separated and moved out of contact with the edges of the music sheet during its rewinding.

The above described mechanism for controlling the movement of the music sheet as it passes over the tracked bar involves no change in the usual mechanism now employed in actuating the receiving spool during the playing of a selection, or in actu-

ating the delivery spool during the rewinding of the music sheet. As the proper tracking of the music sheet only requires the alinement of its perforations with the perforations of the tracker bar, it is obvious that this can be accomplished by the movement of the music sheet or by the movement of the tracker bar in order to maintain the proper relation of one to the other.

10 I therefore do not wish to confine myself to the movement of the delivery spool. The apparatus embodying my present invention is extremely sensitive, the only pressure against the edge of the music sheet is that required to move the friction disk 38 to the right or left, a short distance to bring its periphery into contact with either the gear 39 or the disk 40 and the leverage exerted by the arm 47 reduces the resistance to the movement of the rack 42, thereby enabling the spool 2 to be moved by a slight force applied through the friction disk 38. The connection of the plates 19 and 20 with the rewinding mechanism, whereby the guide plates 19 and 20 are moved out of contact with the music sheet during the rewinding, so far as I am aware, is broadly new.

I claim:

30 1. In a mechanism of the class described, the combination with a rotatable delivery spool longitudinally adjustable in its bearings, a tracker bar and means for moving a music sheet from said delivery spool over the tracker bar, of a rocking shaft journaled transversely to the axis of said delivery spool, an arm carried by said rocking shaft bearing against said delivery spool to move it in one direction, a spring applied to the delivery spool to move it in the opposite direction, and a second spring applied to said arm to press it toward the delivery spool, and means controlled by the lateral deflection of the music sheet from its normal path over the tracker bar for rocking said shaft.

2. In a mechanism of the class described, the combination with a rotatable delivery spool longitudinally adjustable in its bearings, a tracker bar and means for moving a music sheet from said delivery spool over the tracker bar, of a rocking shaft journaled transversely to the axis of said delivery spool, an arm carried by said rocking shaft and bearing against said delivery spool to move it in one direction, a spring applied to the delivery spool to move it in the opposite direction, a second spring applied to the delivery arm to press it toward the delivery spool, means for equalizing the tension of said springs, and frictional means for imparting rotation to said transverse shaft, controlled by the deflection of the music sheet from its normal path over the tracker bar.

3. In a mechanism of the class described, the combination with a rotatable delivery

spool longitudinally adjustable in its bearings, of means for controlling the endwise movement of said delivery spool, comprising a shaft located transversely to the axis of the delivery spool, a friction wheel mounted on one end of said shaft, frictional driving members on opposite sides of said friction wheel, a pinion mounted on the opposite end of said shaft, a slidable rack engaged by said pinion, a rocking shaft actuated by the sliding movement of said rack, an arm carried by said rocking shaft applied to move the delivery spool in one direction, a spring for reversing the movement of the delivery spool, and a second spring applied to said arm, and means for adjusting the tension of said second spring.

4. In a mechanism of the class described, the combination with a delivery spool carrying a music sheet, a takeup spool and a tracker bar, of a driving shaft, rewinding mechanism for actuating the delivery spool, a slidable clutch connection between the said rewinding mechanism and the driving shaft, a slidable pinion having a spline connection with the driving shaft and attached to said clutch connection, a gear carried by the takeup spool engaging said sliding pinion, a shaft parallel with said driving shaft, a gear on said shaft in engagement with said slidable pinion and forming a frictional driving member, a disk on said shaft forming a second frictional driving member, a friction wheel journaled between said driving members and normally spaced therefrom, means controlled by the lateral deflection of the music sheet from its normal path over the tracker bar for moving said friction wheel into contact with one or the other of said driving members, and means for simultaneously shifting said clutch and pinion out of engagement with the takeup roll and said frictional driving members and into engagement with said rewinding mechanism.

5. The combination with a delivery spool carrying a music sheet, a tracker bar, a takeup roll, means for rotating the takeup roll to move the music sheet over the tracker bar, of guide plates on the opposite sides of the music sheet, means for adjusting the position of each guide plate relatively to the normal path of the music sheet, comprising a swinging lever carrying a guide plate, a second parallel swinging lever operatively connected with mechanism for controlling the path of the music sheet, and means for adjusting the space between said levers.

6. In a mechanism of the class described, the combination with a tracker bar, a music sheet and means for moving the music sheet over the tracker bar, of a pair of levers on opposite sides of the path of a music sheet as it is moved over the tracker bar, with said levers pivoted at one end to a fixed framework, an adjustable connection between the

free ends of each pair of levers, a guide plate carried by one of the levers of each pair in contact with the edges of the music sheet, a mechanism controlling the movement of the music sheet over the tracker bar, and a connection between the other lever of each pair of levers and said controlling mechanism.

7. In a mechanism of the class described, the combination of a tracker bar, means for moving the music sheet over the tracker bar, mechanism for controlling the path of the music sheet over the tracker bar, comprising a swinging guide bar in contact with each edge of the music sheet, frictionally actuated mechanism for controlling the movement of the music sheet over the tracker bar, and an independent operative connection between each guide bar and said sheet controlling mechanism.

8. In a mechanism of the class described, a music sheet, a frictionally actuated sheet controlling mechanism and means for bringing said sheet controlling mechanism into action, comprising a pivoted lever carrying a member of the sheet controlling mechanism, a second lever pivoted on the first

named lever, a pair of swinging guide plates contacting with the edges of the music sheet, a link connecting each of said guide plates with said second lever on opposite sides of its pivotal connection with said first named lever.

9. In a mechanism of the class described, a music sheet controlling mechanism, comprising a pair of guide plates contacting with the edges of a music sheet, a pivoted lever, a connection between one of said guide plates and said pivoted lever on one side of its pivot, a connection between the other guide plate and said pivoted lever on the other side of its pivot, a music sheet rewinding mechanism, and a connection between said rewinding mechanism and said pivoted lever, whereby said pivoted lever is rocked when the rewinding mechanism is brought into action to separate the guide plates from the music sheet.

Dated this seventeenth day of January, 1919.

CLAUS E. PETERSON.

Witnesses:

PENELOPE COMBERBACH,  
NELLIE WHALEN.