



O. HIGEL.

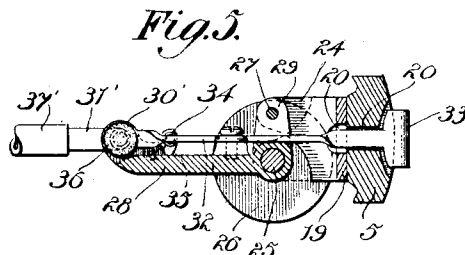
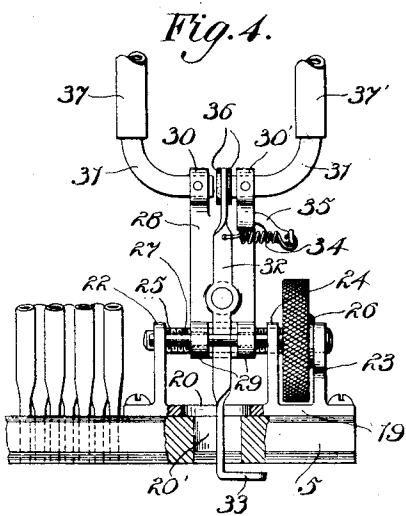
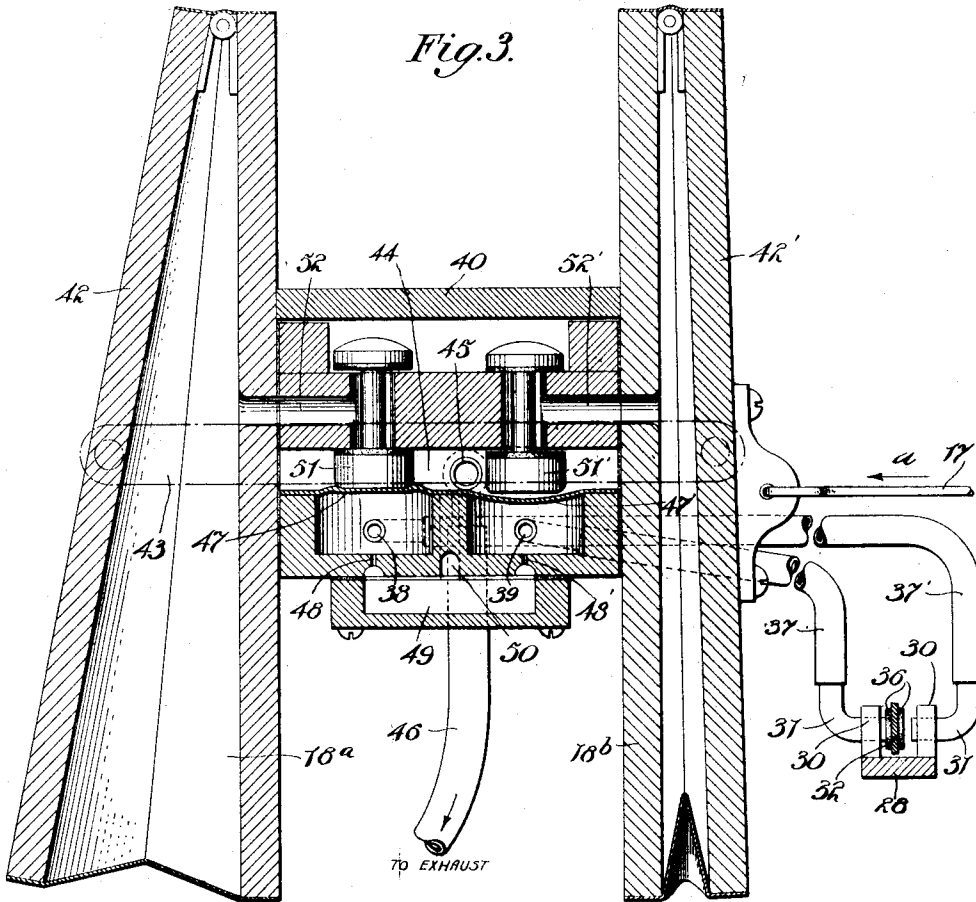
SHEET GUIDING MECHANISM FOR TRACKER BOARDS OF MUSICAL INSTRUMENTS.

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1,196,456.

Patented Aug. 29, 1916.

2 SHEETS—SHEET 2.



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# TED STATES PATENT OFFICE.

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SHEET-GUIDING MECHANISM FOR TRACKER-BOARDS OF MUSICAL INSTRUMENTS.

1,196,456.

Specification of Letters Patent.

Patented Aug. 29, 1916.

Application filed July 22, 1915. Serial No. 41,384.

*To all whom it may concern:*

Be it known that I, OTTO HIGEL, subject of the King of Great Britain, residing at Toronto, Canada, have invented certain new and useful Improvements in Sheet-Guiding Mechanism for Tracker-Boards of Musical Instruments, of which the following is a specification.

The present invention relates to improved sheet-guiding means and pertains more particularly to the type used on automatic players for preserving or keeping the music sheet in proper tracking position on the tracker-bar.

The object of the present invention is to provide an improved form of sheet-guiding mechanism for controlling the position of the music sheet across the face of the tracker-bar, which will be automatic in its operation and which will cause the proper adjustment of the spools regardless of the direction in which the music sheet is displaced.

The invention further consists in providing mechanism of the type above referred to adapted to be operated by the continual contact of the edge of the music sheet with a single contact lever provided at one side of the tracker-bar. By employing the present guiding and tracking means the winding spools can be shifted and adjusted laterally in either direction and the usual extra ports or apertures at the two sides of the tracker-bar can be dispensed with.

A still further object of the invention is to provide an edge guide for the music sheet which can be properly adjusted when the sheet is first put on the machine and will automatically control the operation of all its associated mechanism for preserving the proper alinement of the perforated note sheet with tracker-bar without further attention on the part of the operator.

With these and other objects in view, the invention consists in the combination and arrangement of parts more fully set forth in the following specification, illustrated in the accompanying drawings and pointed out in the appended claims.

In the drawings: Figure 1 is a front elevation of the tracker-box of a pneumatic piano player with its operating mechanism and having the present invention embodied therein. Fig. 2 is a top plan view with parts broken away. Fig. 3 is a vertical sectional view of the shifting bellows and asso-

ciated parts. Fig. 4 is an enlarged plan view of the contact lever mechanism. Fig. 5 is a section on line 5—5 of Fig. 4.

Referring now to the drawings, A represents a portion of the frame, upon which the uprights 1 and 2 of the tracker-box are supported. The music spool 3, take-up spool 4, and perforated tracker-bar 5 are all mounted between the vertical uprights 1 and 2 in the usual manner. A metal gear frame 6 is secured at the outer side of the upright 2 and associated therewith is the winding and rewinding mechanism.

The left-hand spindle of the music spool 3 is engaged by a spring-pressed plunger 7 extending through the frame upright 1, and the right-hand spindle is fitted over the squared end of a plunger 8 formed on the end of a shaft 9 arranged to slide in its bearings in the frame upright 2 and the metal gear frame respectively. The take-up spool 4 is similarly supported between a spring-pressed plunger 7' and a plunger 8' extending from the end of a lower shaft 9'. The shafts 9, 9' are adapted to be alternately coupled to the main drive shaft 10 of the motor according as the music is being fed forward for playing purposes or is being rewound. The spring-pressed plungers 7 and 7', which support the left-hand ends of the spools 3 and 4, are each slidably mounted in their bearings in the upright 1 and are capable of being shifted either to the right or left as occasion may require. The shafts 9, 9' are similarly slidably carried in their bearings. A vertical rod 11 is pivotally supported in brackets 12 on the metal gear frame and is provided with two adjustable stops 13. These stops 13 are adapted to bear against the ends of the shafts 9, 9'. A lever arm 14 is carried by a hub keyed to the shaft or rod 11 and extends rearwardly having its free end pivotally connected to the end of a sliding bar 16, supported in brackets at the rear of the music box. The opposite end of this sliding bar 16 is coupled by a link 17 to the outer side of the shifting bellows 18<sup>b</sup>.

The contact lever mechanism comprises a bracket plate 19, fastened by screws to the rear face of the tracker-bar 5, suitably located at the right-hand side of the bar. The plate 19 is provided with a longitudinal slot 20 registering with a similarly formed slot 20' formed in the tracker-bar.

The bracket plate 19 is formed as a single

metal casting and in addition to the face plate 19, secured along the rear face of the tracker-bar, consists of three plates or bracket arms 22, 23, and 24 formed integral therewith and disposed at right-angles thereto. Between the plates 22 and 23 which are formed at the outer sides of the plate 19 is supported a small threaded shaft 25, having a knurled adjustable thumb screw 26, carried thereon. Between the bracket plate 22 and the intermediate plate 24 a small rigid bar or shaft 27 is supported parallel to the threaded shaft 25. A second metal casting 28 in the form of an L-shaped plate is carried on the shafts 25 and 27, being screw-threaded on the former and having a pair of perforated ears or lugs 29 slidably engaging with the latter. This L-shaped plate 28 has its longer side extending rearwardly at right-angles to the face of the tracker-bar 5 and is formed at its outer free end with a pair of upstanding perforated lobes 30, 30' formed at its opposite sides. Extending into these lobes 30, 30' a pair of metal tubular members 31, 31' are soldered or otherwise secured thereto. A contact lever 32 is pivotally connected to the upper surface of the longer portion of the L-shaped plate 28 and extends forwardly through the slots 20, 20' terminating in a flat head or contact piece 33 projecting through to the outer face of the tracker-bar. Rearwardly of its pivot point the contact lever extends in a straight line and terminates in a thin metal plate between the opposing openings of the tubular members 31, 31'. Small disks 36 of felt or other material are secured at either side of this end of the lever and serve as valves to close alternately the apertures of the tubular members 31, 31'. A small coil spring 34 carried by an extension 35 from the side of the L-shaped plate 28 has its end secured to the rear arm of the contact lever 32 and tends to maintain the end normally shifted to the right. A vertical line is marked across the face of the tracker-bar at either end to indicate the lines along which the edges of the sheet of music normally follow. The line marked at the right-hand end of the tracker-bar is approximately coincident with the centers of the slots 20, 20'. The right-hand edge of the music sheet should normally bear against the head 33 of the contact lever 32, so as to exert a slight pressure against the action of the small coil spring 34 and thus normally maintain the contact lever 33 in a position at right angles to the plane of the tracker-bar and consequently with its rear end, carrying the valvular disks 36 intermediate of the apertures of the tubular members 31, 31'. In order to properly adjust the contact lever 32 and its head 33 in proper relation to the music sheet, it is only necessary to manipulate the thumb screw 26

thereby shifting the L-shaped plate transversely back and forth along the shafts 26, and 27. As a guide for ascertaining the proper adjustment, the vertical line across the face of the tracker-bar is of service. Tubular members 31, 31' are connected by means of small rubber pipes 37, 37' to metal nipples 38, 39 of a valve box 40 on either side of which are located shifting bellows 18<sup>a</sup> and 18<sup>b</sup>.

The shifting bellows are of the type usually employed in pneumatic piano players and consist of two pneumatics 18<sup>a</sup> and 18<sup>b</sup> carried on either side of a valve-box 40 supported by vertical standards 41 from the frame A. The outer movable members 42 and 42' of the pneumatics 18<sup>a</sup> and 18<sup>b</sup> are coupled together by a rigid link or bar 43. Referring more particularly to Fig. 3, it will be seen that the valve box 40 comprises a main chamber 44 connected by a nipple 45 and pipe 46 with the main exhaust (not shown). In the lower part of the valve box 40 are located a pair of diaphragms 47, 47' having suitable spaces beneath them which are connected by the nipples 38, 39 to the flexible pipes 37 37' leading to the tubular members 31 and 31' at the contact lever mechanism in the tracker-bar. Restricted bleed passages 48 and 48' communicate from the spaces beneath the diaphragms 47 and 47' with a small chamber 49 located at the underside of the valve box 40 and connected by a passage 50 directly with the main chamber 44 above the diaphragms. Valves 51 and 51' are provided in the upper wall of the valve box 40 and have their lower ends resting on, or in the path of movement of the diaphragms 47, 47'. The stems of the valves 51 and 51' move in passages somewhat larger than their diameters and the valves control passages 52 and 52' which when the valves are lowered place the chamber 44 in direct communication with the interiors of the pneumatics 18<sup>a</sup> and 18<sup>b</sup>.

The operation of the apparatus is as follows: Under normal conditions the edge of the sheet of music is in contact with the head 33 of the contact lever 32, so that the lever 32 is substantially at right angles to its rear extremity carrying the valvular disks 36 will be in a position intermediate of the two apertures of the tubular members 31 and 31'. Therefore both of the pipes 37 and 37' will be open to the atmosphere. Atmospheric pressure will be admitted to the spaces below the diaphragms 47 and 47' while the suction from the exhaust passage 45 will tend to keep the diaphragms distended upwardly, holding the valves 51 and 51' raised with the passages to the pneumatics 18<sup>a</sup> and 18<sup>b</sup> closed. The bellows of the pneumatics will assume an intermediate or neutral position.

Now supposing the sheet of music slips to the right beyond the mark on the tracker bar with which it should normally register, due either to some irregularity in the paper or to some accidental displacement of the winding spools. In such event the music sheet in order to be returned to its proper position must necessarily be moved to the left along the face of the tracker bar. This is accomplished by simultaneously shifting the spools 3 and 4 in a direction to the left. The shifting operation takes place automatically in the following manner: The accidental displacement of the music sheet to the right causes the head 33 to move to the right and consequently the rear end of this lever moves to the left against the action of the coil tension spring 34, so that one of the valvular disks 36 closes the aperture of the tubular member 31. This cuts off the atmosphere from pipe 37 which is connected by the metal nipple 39 with the space beneath diaphragm 47'. The atmosphere having been thus shut off beneath the diaphragm 47', any air which is in this space is drawn out through the restricted bleed passage 48' and consequently the diaphragm 47' is deflated, with the result that the valve 51' is dropped and a direct communication through the passage way 52' is established between the exhaust chamber 44 and the interior of the pneumatic 18<sup>b</sup>. This causes the pneumatic 18<sup>b</sup> to collapse and the pneumatic 18<sup>a</sup> simultaneously to expand, with the result that the sliding bar 16 is moved to the left, as indicated by the arrow *a*, Fig. 3. This causes the vertical rod 11 to turn about its pivot and the two metal stops 13 to bear against the ends of the shafts 9 and 9', moving them simultaneously to the left. This movement of the parts will continue until the paper music sheet again assumes its normal position tracking with the vertical mark on the face of the tracker bar when the contact lever will again assume its normal position and the port of the tubular member 31 will be uncovered, so that the various parts will be returned to their initial positions. Should the sheet of music depart in the opposite direction, that is to the left along the tracker bar, a similar set of operations would take place in the same sequence, with the result that the opposite bellows or pneumatic 18<sup>a</sup> would be collapsed and the shifting motion of the parts would be repeated but in a reverse direction.

It will be seen from the above description that the operation of the sheet guiding and tracking mechanism is entirely automatic. The contact lever 32 having once been prop-

erly adjusted so that the music sheet assumes its proper normal position in relation to the vertical guide mark on the face of the tracker bar, all subsequent shifting of the spools 3 and 4 to accommodate irregularities with the edge of the paper or accidental displacement of either or both of the spools is accounted for and rectified without any attention whatever on the part of the operator.

The simplicity of the present device and the efficiency with which the several parts perform their respective functions present many advantages over previous forms, in which special ducts were provided, one at either end of the note perforations on the tracker bar. The device is vastly more simple and more efficacious than other forms of apparatus in which a contact lever was provided for each edge of the music sheet.

What I claim is:—

1. In an apparatus of the class described, the combination with a perforated tracker-bar and sheet rolls adapted to carry a perforated music sheet, of means operative to shift one of said parts relatively to the other to insure the proper registration of the sheet perforations with those of the tracker-bar, said means including a single supporting member adjustable longitudinally of the tracker-bar, a pair of juxtaposed ports carried on said member, and a swinging lever having a valve located between said ports for controlling the same, said lever being pivoted to said adjustable member and having a part in position to be engaged by the music sheet.

2. In an apparatus of the class described, the combination with a perforated tracker-bar and sheet rolls adapted to carry a perforated music sheet, of means operative to shift one of said parts relatively to the other to insure the proper registration of the sheet perforations with those of the tracker-bar, said means including a guide rod and a rotatable screw shaft supported parallel to the tracker board, a bracket slidably connected with said guide rod and having a threaded part engaged by said screw shaft, spaced opposed ported members secured to said bracket, and a lever pivoted to said bracket and having one end located between said ported members and its other end in position to be engaged by the music sheet.

In testimony whereof, I have affixed my signature in presence of two witnesses.

OTTO HIGEL.

Witnesses:

GEO. P. MACKIE,  
N. R. TYNDALL.