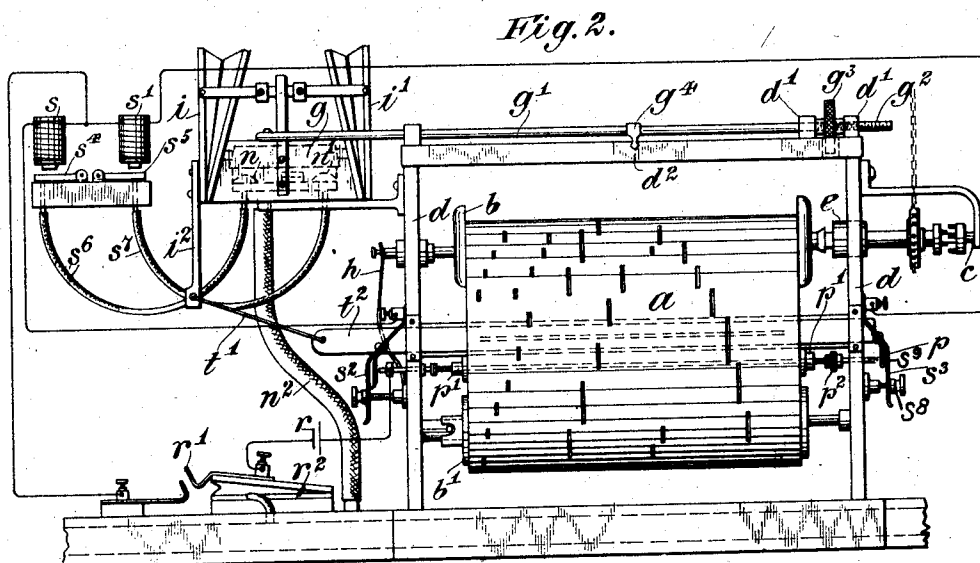
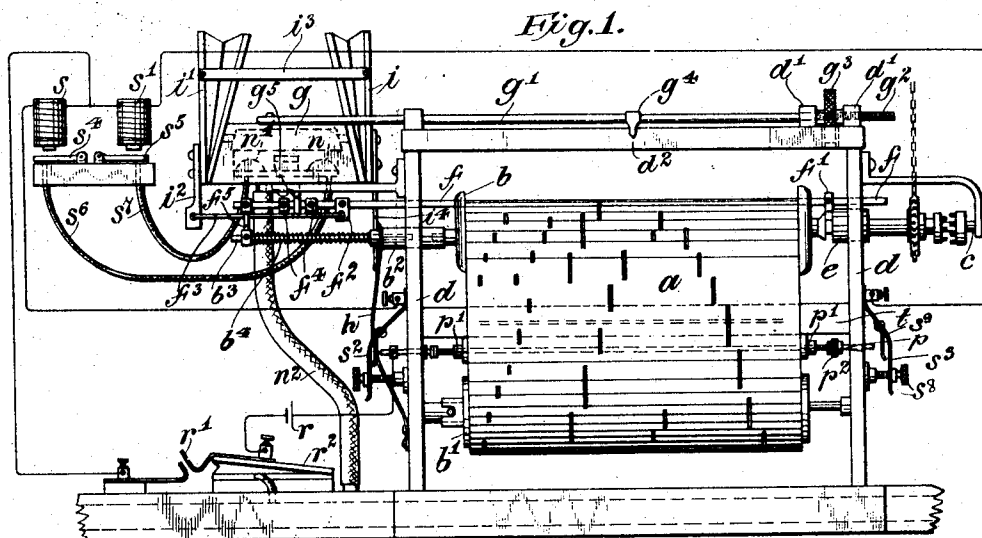


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SHEET ADJUSTING DEVICE FOR MECHANICAL MUSICAL INSTRUMENTS.
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SHEET-ADJUSTING DEVICE FOR MECHANICAL MUSICAL INSTRUMENTS.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JOHN A. WESER, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Sheet-Adjusting Devices for Mechanical Musical Instruments, &c., of which the following is a specification, reference being had to the accompanying drawing, forming a part hereof.

This invention has for its object to provide improved devices for insuring the proper lateral positioning of a traveling web or sheet, such as the perforated music sheet of a mechanical piano, so that it shall register accurately with the cooperating devices, such as the holes in the tracker-board.

In another application for Letters Patent of the United States, Serial No. 519,916, filed September 28, 1909, there are shown and described devices intended to accomplish the general purpose above stated, such devices comprising a floating detector which is moved readily by contact with the edge of the web or sheet, offering practically no resistance, such detector, by its movements, inaugurating the operation of the device by which the web or sheet is shifted, while the detector is not positively or mechanically connected therewith. In one form of the device shown in said application, the detector operates valves, one at each end, which, through suitable pneumatic connections, control the operation of the sheet shifting devices, which are themselves pneumatic. In another and different specific embodiment of the floating detector shown in said application, the movement of the detector controls an electric circuit or electric circuits by which the operation of the sheet shifting device is controlled. It is with this latter embodiment of the floating detector that the present invention is particularly concerned and the present application is in effect a division of said earlier application, although the illustration of the embodiment of the invention is somewhat amplified and different forms thereof are illustrated. The invention will be more particularly explained hereinafter with reference to the accompanying drawing in which it is illustrated and in which—

Figure 1 is a view in front elevation of so much of a mechanical player as is necessary to illustrate the application of the inven-

tion, the electrical connections being represented diagrammatically. Fig. 2 is a similar view showing a modification.

In the embodiment of the invention illustrated in the drawings the music sheet *a* is 60 carried, as usual, by two spools or rolls *b b'* one of which is driven by any suitable means through a shaft *c*. The spool *b* has a limited capacity for longitudinal movement in the supporting framework *d*, the other spool 65 *b'* being usually formed without heads so that lateral movement of the web or sheet with respect thereto is not restrained.

In the construction shown in Fig. 1 a circumferentially grooved hub *e* connected to 70 the spool *b*, so that the two move longitudinally and rotate together, is engaged by an arm *f'* on a longitudinally movable rod *f* supported in the framework *d* parallel with the axis of the spool *b*. Through a block *f*² 75 adjustably secured on the rod *f* and a link *f*³, the rod *f* is operatively connected with an arm *i*² on the movable member of one or the other of two oppositely disposed bellows *i* and *i'*, the said movable members being connected by a link *i*³, so that the collapsing, or partial collapsing, of one bellows or the other will move the rod *f*, and therefore the spool *b*, in one direction or the other. The two bellows *i* and *i'* are carried by a box or 85 frame *g* which supports the respective pneumatic controlling devices of usual character for the bellows *i* and *i'*, and the box or frame *g* is adjustable laterally with respect to the frame *d*, being preferably carried by 90 a bar *g'*, threaded at its end *g*² and engaged by an adjusting nut *g*³ mounted between stops *d'* on the frame *d*. The bar *g'* preferably is provided with an indicator *g*⁴ so that, by reference to a central mark *d*² 95 on the frame *d*, the bellows *i* and *i'* and, through the link *f*³, the rod *f*, and the spool *b*, may be accurately adjusted in position. A finger *g*⁵ projects downwardly from the box or frame *g* between two rather widely spaced collars 100 *f*⁴ on the bar *f* so as to limit the movement of the bar *f* and therefore of the spool *b* with respect to the box or frame *g* and the bellows *i* and *i'*.

For the purpose of centralizing the spool 105 *b*, after longitudinal movement in either direction, a flat spring *h*, secured to the framework *d*, is arranged to bear (being forked for the purpose) against the outer end of a longitudinally movable socket *b*² which is 110

mounted in the frame *d* and furnishes a bearing for the corresponding end of the spool *b*, the said socket also receiving, in its outer end, with capacity for relative longitudinal movement a rod *b*¹, which is connected with the rod *f* by an arm *f*¹ while a spiral spring *b*², supported by the stem *b*³, bears against the socket *b*² at one end as an abutment and acts, at the other end, through the arm *f*¹ upon the rod *f*. The two springs *h* and *b*² therefore act in opposition upon the spool *b* and tend to centralize it when it has been moved from its central or normal position in either direction.

The floating detector, in the construction shown, in Fig. 1 and in Fig. 2 as well, consists of a light rod *p* mounted for free movement longitudinally in the framework *d* and having fingers *p*¹ for coöperation with the edges of the web or sheet respectively, the rod *p* being freely rotatable and right and left threaded at its ends to engage the fingers and provided with a milled head *p*² so that by rotation of the rod the fingers *p*¹ may be spaced apart with accuracy to accommodate the web or sheet *a* without affecting the operation of the automatic adjusting device. The rod *p* freely supported by the frame but otherwise mechanically unconnected with the operating mechanism is connected electrically, as through a battery *r* and an automatic switch *r*¹, to a common point between two magnets *s* and *s*¹. One of such magnets is connected electrically with an adjustable spring contact *s*² in line with the rod *p* and adjacent to one end thereof, while the other of such magnets is connected with a similar adjustable spring contact *s*³ in line with the rod *p* and adjacent to the other end thereof. The magnets *s* and *s*¹ respectively control valves *s*⁴ and *s*⁵ which normally close the terminal ports of pneumatic tubes *s*⁶ and *s*⁷ connected respectively with the bellows valves or pneumatics *n* and *n*¹.

It will now be seen that if the web or sheet *a* shifts out of position toward the left it will close the circuit of the magnet *s* through the contact *s*² and that the magnet will open the valve *s*⁴, thereby, through the corresponding valve *n*, causing the bellows *i* to be collapsed. Through the connection of the movable members of the two bellows (both bellows being capable of further expansion beyond the degree indicated in the drawing) the rod *f* will be shifted slightly to the right, carrying with it the spool *b* and the music sheet *a*. Similarly, if the sheet *a* shifts accidentally to the right the bellows *i*¹ will be collapsed and the spool *b* will be moved slightly to the left. The excessive movement of the spool *b* to the left is checked by the bearing of the socket *b*² against the spring *h* and excessive movement of the spool to the right is checked by

the bearing of an arm *i*², on the movable member of the bellows *i* against the other side of the spring *h*. It will be understood, of course, that the valves *n* and *n*¹ are connected with the vacuum system of the pneumatic player through a tube *n*² in the usual manner. When the instrument is not in use, the circuit of the battery is opened at the automatic switch *r*¹, one member of which is carried by the movable member of a bellows *r*². As soon, however, as vacuum pressure is created the bellows *r*² is collapsed and the switch *r*¹ is closed.

It is obviously immaterial whether the music sheet be shifted with respect to a stationary tracker-board as shown in Fig. 1, or the tracker-board itself be shifted with respect to the music sheet, as shown in Fig. 2. In this embodiment of the invention the bellows *i*¹, the magnets *s*¹, valves *s*⁴ *s*⁵, valves *n* *n*¹ and floating detector rod *p* with their several connections, are arranged and operate as already described with respect to Fig. 1, but the arm *i*² of the bellows *i*¹ is connected by a link *i*³ with a longitudinally movable tracker-board *t*¹, which may be arranged in any usual or suitable manner, such longitudinally movable tracker-boards being well known in the art. Any accidental shifting of the music sheet *a* will therefore, through the described connections, produce a corresponding shifting of the tracker-board so that the relative position of the music sheet and tracker-board are unchanged and the proper registration of the music sheet with the tracker-board is assured.

Each contact *s*² *s*³ is so constructed as to provide for great accuracy in adjustment and at the same time to permit the detector to yield slightly, after contact is made, so that the edge of the web or sheet will not be torn, even when moving rapidly, as in rewinding, in case the action of the sheet-adjusting mechanism is somewhat sluggish. For this purpose the supporting and adjusting spring *s*², *s*³, which is secured to the frame *d* and is provided with a binding-post at one end and at the other bears against the adjusting nut *s*², has on its inner face, adjacent to the end of the detector, an elastic, flat spring *s*² which yields readily when the end of the detector presses against it, thus permitting the detector to yield further, if necessary, after the circuit is completed.

I claim as my invention:

1. In a sheet adjusting mechanism, the combination of a floating detector, freely supported but otherwise mechanically unconnected with the mechanism and movable freely in either direction with variations in the lateral position of the sheet, oppositely acting pneumatic sheet adjusting devices and corresponding electrical devices for control-

ling the operation of the sheet adjusting devices respectively, the action of one or the other of said electrical devices being determined by the movement of the detector in one direction or the other.

2. In a sheet adjusting mechanism, the combination of a floating detector, freely supported but otherwise mechanically unconnected with the mechanism and movable freely in either direction with variations in the lateral position of the sheet, oppositely acting pneumatic sheet adjusting devices, corresponding valves for controlling the operation of the sheet adjusting devices respectively and corresponding electro-magnetic devices for controlling said valves respectively, the action of one or the other of said electro-magnetic devices being determined by the movement of the detector in one direction or the other.

3. In a sheet adjusting mechanism, the combination of a floating detector, freely supported but otherwise mechanically unconnected with the mechanism and movable freely in either direction with variations in the lateral position of the sheet, oppositely acting bellows and connections for adjusting the lateral position of the sheet, and corresponding bellows valves, valves for controlling said bellows valves respectively and electro-magnetic devices for controlling said last named valves, the action of one or the other of said electro-magnetic devices being determined by the movement of the detector in one direction or the other.

4. In a sheet adjusting mechanism, the combination of a floating detector, freely supported but otherwise mechanically unconnected with the mechanism and movable freely in either direction with variations in the lateral position of the sheet, a spool movable longitudinally to shift the sheet, oppositely acting bellows and connections to shift the spool with their corresponding controlling valves, valves to control said bellows valves respectively and corresponding electro-magnetic devices for controlling said last named valves respectively, the action of one or the other of said electro-magnetic devices being determined by the movement of the detector in one direction or the other.

5. In a sheet adjusting mechanism, the combination of a floating detector, subject to variations in the lateral position of the sheet, comprising a freely movable rod supported adjacent to the sheet and fingers to cooperate with the edge of the sheet, oppositely acting sheet adjusting devices and corresponding electro-magnetic devices for controlling the action of the sheet adjusting devices, the action of one or the other of said electro-magnetic devices being deter-

mined by the movement of the detector in one direction or the other.

6. In a sheet adjusting mechanism, the combination of a floating detector, subject to variations in the lateral position of the sheet, comprising a freely movable rod supported adjacent to the sheet and fingers to cooperate with the edges of the sheet, oppositely acting sheet shifting bellows with their corresponding controlling valves, corresponding valves to control the bellows valves respectively and electro-magnetic devices for controlling said last named valves respectively, the action of one or the other of said electro-magnetic devices being determined by the movement of the detector in one direction or the other.

7. In a sheet adjusting mechanism for mechanical musical instruments, the combination of a tracker-board and a music sheet spool, the said tracker-board and spool being relatively movable longitudinally, the one with respect to the other, oppositely acting pneumatic devices for shifting the movable part with respect to the other, a floating detector freely supported but otherwise mechanically unconnected with the mechanism and movable freely in either direction with variations in the lateral position of the sheet and electro-magnetic devices for controlling the operation of the pneumatic devices respectively, the action of one or the other of said electro-magnetic devices being determined by the movement of the detector in one direction or the other.

8. In a sheet adjusting mechanism for mechanical musical instruments, the combination of a tracker-board and a music sheet spool, the said tracker-board and spool being relatively movable longitudinally, the one with respect to the other, oppositely acting bellows for shifting the movable part with respect to the other with their corresponding valves, corresponding valves to control said bellows valves respectively, a floating detector freely supported but otherwise mechanically unconnected with the mechanism and movable freely in either direction with variations in the lateral position of the sheet, and electro-magnetic devices for controlling said last named valves respectively, the action of one or the other of said electro-magnetic devices being determined by the movement of the detector in one direction or the other.

This specification signed and witnessed this 29th day of December A. D. 1909.

JOHN A. WESER.

Signed in the presence of—
CONRAD HARRIS,
MAX LEVIAN.