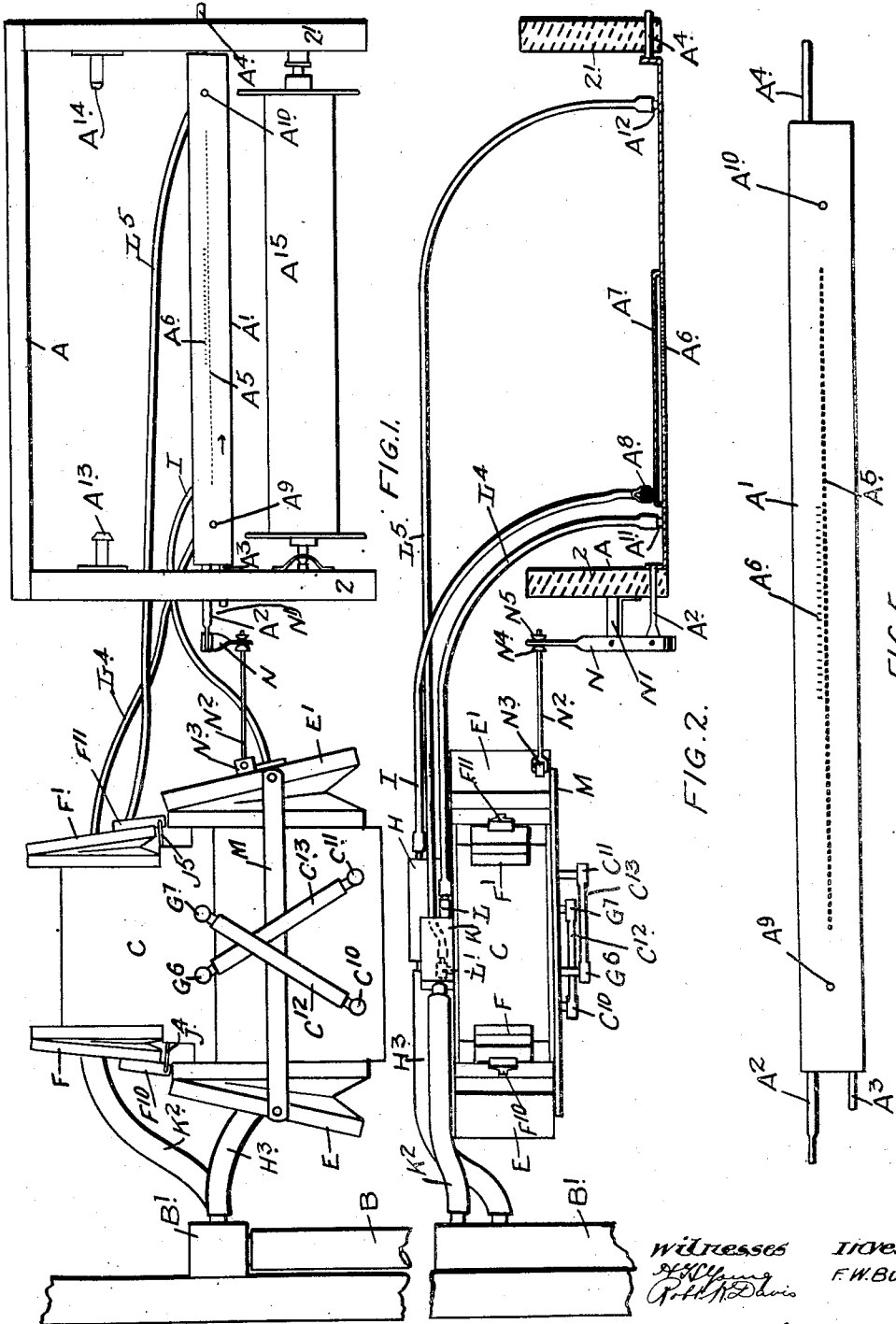


F. W. BULL.
TRACKER FOR PLAYER PIANOS.
APPLICATION FILED MAR. 10, 1911.

1,051,802.

Patented Jan. 28, 1913.

2 SHEETS—SHEET 1.



Witnesses
J. H. Davis
F. W. Bull.

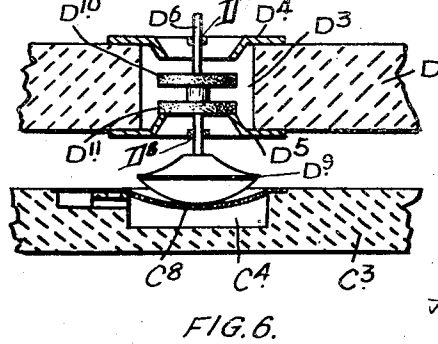
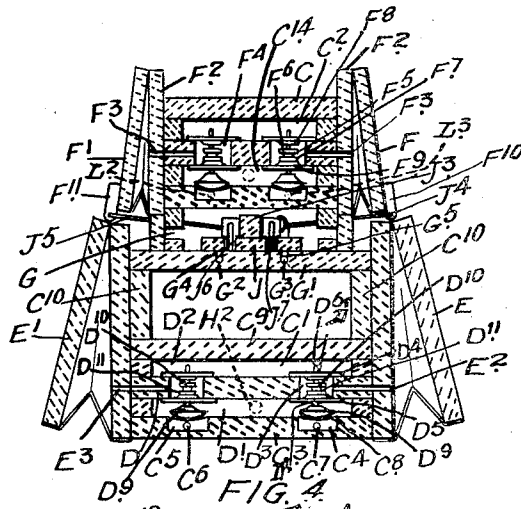
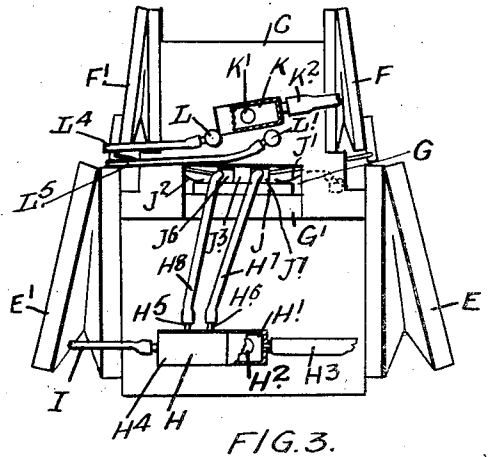
By D. Schuster

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2 SHEETS—SHEET 2.



Witnesses.
A. S. Young
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UNITED STATES PATENT OFFICE.

FRANK WESLEY BULL, OF OSHAWA, ONTARIO, CANADA.

TRACKER FOR PLAYER-PIANOS.

1,051,802.

Specification of Letters Patent.

Patented Jan. 28, 1913.

Application filed March 10, 1911. Serial No. 613,503.

To all whom it may concern:

Be it known that I, FRANK WESLEY BULL, of the town of Oshawa, in the county of Ontario, in the Province of Ontario, Canada, have invented certain new and useful Improvements in Trackers for Player-Pianos, of which the following is the specification.

My invention relates to improvements in trackers for player pianos and the object of the invention is to devise a simple automatic and efficient means for correcting the faulty alinement of the music roll as it crosses the tracker bar and perforations thereof so that every note will be played correctly and continuously as the roll passes over the bar, such faulty alinement resulting from swollen or shrunk rolls, from faulty roll flanges or torn or mutilated edges or by the roll flanges extending beyond the width of the roll.

It consists essentially of a longitudinal tracker bar having a series of small perforations located between the note perforations of the tracker bar, supplemental openings located in proximity to each end of the tracker bar and substantially opposite the path of travel of the edge of the music roll, a valve box provided with suitable valves and ducts extending between the perforations and openings of the tracker bar and the valve chamber in such a way so as to control the longitudinal movements of the tracker bar when the perforations located between the note perforations are uncovered and one of the aforesaid openings are covered as hereinafter more particularly described by the following specification.

Figure 1, is a front elevation of my device. Fig. 2, is a plan view of my device. Fig. 3, is a rear detail elevation of the valve box. Fig. 4, is a sectional elevation of the valve box. Fig. 5, is an enlarged detail face view of the tracker bar. Fig. 6, is an enlarged sectional detail of one of the valves located in the valve box.

In the drawings like letters of reference indicate corresponding parts in each figure.

A is the frame of the instrument.

A' is the tracker bar provided with stems A² and A³ and A⁴ slidably held within the side portions 2 and 2' of the frame A. The tracker bar A' is provided with the usual eighty-eight air ducts for notes A⁵.

A⁶ are a series of supplemental air ducts located between the note perforations, that

is to say, directly above the partition dividing the note perforations.

A⁷ is a duct secured to the back of the tracker bar A' and into which the perforations A⁶ lead. The duct A⁷ is provided with a nipple A⁸.

A⁹ and A¹⁰ are supplemental ducts formed in the tracker bar in proximity to each end thereof and substantially opposite the path of travel of each edge of the paper of the music roll.

A¹¹ and A¹² are nipples extending from the ducts A⁹ and A¹⁰.

A¹³ and A¹⁴ are bearings for supporting the music roll and A¹⁵ is the take-up roll.

B is the main tube leading from the main reservoir to the wind chest B'.

C is the valve box designed to control the movement of the tracker bar when the air ducts A⁶ and ducts A⁹ or A¹⁰ are uncovered.

I will now describe the construction of the valve box C. C' is the lower valve chamber (see Fig. 4) and C² the upper valve chamber. The lower valve chamber C' comprises the base board C³ having recesses C⁴ and C⁵ into which ducts C⁶ and C⁷ extend, the recesses C⁴ and C⁵ are provided with pouches C⁸ extending over the same. D is a partition extending across the valve chamber intermediately of the height thereof and dividing such chamber into a vacuum chamber D¹ and the chamber D² which is open to the atmosphere. D³ are orifices extending through the partition D above and below which are secured the upper and lower valve seats D⁴ and D⁵. D⁶ is the valve stem extending through the orifices D¹ and D². The lower end of the valve stem is provided with the buttons D⁹ resting upon the pouch C⁸. D¹⁰ and D¹¹ are the upper and lower valves designed to co-act alternately with the upper and lower valve seats D⁴ and D⁵ respectively. E and E' are the lower pneumatics. E² and E³ are ducts leading from the lower pneumatic E and E' to the orifices D³. F and F' are the upper pneumatics supported upon the end boards F² at each end of the upper valve chamber C².

The valve chamber C² is similarly constructed to the lower valve chamber C' as hereinbefore described and is provided with similar ducts F³ leading from the upper pneumatics F and F' to the orifices F⁴ and F⁵ in which the valves F⁶ and F⁷ operate and

co-act with the seats F^8 and F^9 . Beneath the upper valve chamber C^2 is located a supplemental valve chamber G having a base board G' supported upon the top board C^9 by the end pieces C^{10} .

G^2 and G^3 are ducts formed in the base board G' , such ducts being provided with vertical portions G^4 and G^5 extending through the upper face of the board G' .

G^6 and G^7 are nipples secured in the outer ends of the ducts G^2 and G^3 (see Fig. 1).

C^{10} and C^{11} are nipples secured in the ducts C^6 and C^7 .

C^{12} and C^{13} are crossed tubes connecting the nipple G^6 with the nipple C^{11} and the nipple G^7 with the nipple C^{10} .

H is a divided wind chest, the portion H' of which communicates with the vacuum chamber D' of the lower valve chamber C' by means of the orifice H^2 .

H^3 is a tube leading from the portion H' of the wind chest H to the main wind chest B' .

I is a tube leading from the portions H^4 of the wind chest H to the duct A^7 secured to the tracker bar A' and with which the ducts A^6 communicate.

J is a slide valve spring held against the board G' ; by the springs J^1 and J^2 . The slide valve J is provided with a central cross bar J^3 connected by links J^4 and J^5 to the lugs F^{10} and F^{11} secured to the movable portions of the upper pneumatics F and F' .

J^6 and J^7 are nipples extending through the slide valve J and forming ducts leading to the lower face of the slide valve.

H^5 and H^6 are nipples leading into the portions H^4 of the wind chest H .

H^7 and H^8 are tubes leading from the nipples H^5 and H^6 to the nipples J^6 and J^7 .

K is a wind chest secured to the casing of the upper valve chamber C^2 and communicating with the vacuum chamber C^{14} by means of the orifice K' .

K^2 is a tube leading from the wind chest K to the main wind chest B' .

L and L' are nipples secured in the ducts L^2 and L^3 shown by dotted lines in Fig. 4.

L^4 and L^5 are tubes leading from the nipples L and L' to the nipples A^{11} and A^{12} communicating with the air ducts A^9 and A^{10} of the tracker bar.

M is a link pivotally connected at each end to the movable portions of the lower pneumatics E and E' .

N is a lever pivotally connected upon the bracket N' intermediately of its length. The outer end of the lever N is pivotally connected to the flattened end of the stem A^2 . The opposite end of the lever is connected by a link N^2 to the lug N^3 secured to the lower pneumatic E' . The opposite end of the link passes through the enlarged opening in the lever N and is secured in

position therein by the semi-spherical nuts N^4 and N^5 bearing against each side of the lever N .

Having described the principal parts involved in my invention I will briefly describe the operations of the same. It will be understood that, as the perforated paper of the music roll passes over the tracker bar with each edge of the paper normally clear of the ducts A^9 and A^{10} and the ducts A^6 normally covered, should the perforations of the paper, however, for any reason be out of alinement with the note perforations of the tracker bar it will necessarily uncover the supplemental perforations of the tracker bar located between the note perforations. For the purpose of illustration we will assume that the paper has moved in the direction of the arrow or that the edge of the paper or the position of the perforations therein are faulty thereby covering the duct A^{10} and uncovering the ducts A^6 . When this takes place the air passes through the tube L^4 , through the nipple L of the tube, into the recess beneath the valve F^4 thereby raising the pouch thereof and the valve off the seat F^9 and against the seat F^8 . By this operation suction is produced from the upper pneumatic F' , through the duct F^3 , orifice K' , wind chest K , tube K^2 leading to the main wind chest B' which is connected to the main bellows by the tube B . This operation draws the pneumatic F' into its closed position allowing the pneumatic F which remains open to the atmosphere to open. The pneumatics F and F' as hereinbefore described are connected by the links J^4 and J^5 to the slide valve J thereby moving the slide valve so that the nipple J^7 registers with the extension G^5 of the duct G^3 . This operation allows the air to pass from the ducts A^6 through the duct A^7 , through the wind chest H , tube H^7 , nipple J^7 , duct G^3 leading to the nipple G^6 communicating with the tube C^{13} and the nipple C^{11} communicating with the recess C^8 beneath the pouch of the valve D^9 to the left of Fig. 4 thereby raising the valve disk D^{11} upon the plate corresponding with D^5 and lifting the valve disk D^{10} against the seat D^4 and thereby placing the pneumatic E' in communication with the vacuum chamber D' by means of the duct E^3 and thereby drawing the pneumatic E' into its closed position. This operation moves the tracker bar by means of the link N^2 and the lever N so as to carry the note perforations into alinement with the perforations of the music roll. It will of course be understood that the same operation takes place should the paper move in the opposite direction or should the openings A^6 be uncovered and the opening A^9 at the opposite end of the tracker bar be covered simultaneously for any other reason.

When such is the case of course, air passes through the tube L⁵, through the nipple L', into the recess beneath the valve F⁵ thereby lifting such valve and thereby bringing the pneumatic F into communication with the vacuum chamber C⁴. By this operation the slide valve J is moved into the opposite direction to that previously described thereby bringing the nipple J⁶ in a position to register with the ducts G⁴ and G², air then passes through the uncovered perforations A⁸, through the tube I, wind chest H, tube H⁸, through the nipple G⁴ and duct G² to the nipple G⁷ from whence it passes through the tube C¹² to the nipple C¹⁰ connected by the duct C⁷ to the recess C⁴ thereby lifting the corresponding valve supported over the same and bringing the pneumatic E into communication with the vacuum chamber D' through the duct E³. This operation closes the pneumatic E' thereby moving the tracker bar in the opposite direction to that hereinbefore described.

It will be seen from this description that I have devised a very simple device whereby the tracker bar may be pneumatically moved so as to carry the note perforations of the same into alinement with the perforations of the music roll thereby insuring that the perforations of the paper track with the note perforations of the tracker bar.

What I claim as my invention is:

1. In a tracker for player pianos, the combination with the tracker bar having the usual note ducts therein, of supplemental center ducts located opposite the partitions between adjacent note ducts, and end ducts in proximity to the ends of the tracker bar and normally outside of the path of the travel of the edges of the perforated paper and contiguous thereto, and means operated by the uncovering of the supplemental center ducts when the perforations of the paper move laterally and also by the covering of one end duct by the lateral movement of the edges of the paper whereby the note ducts are again brought into alinement with the perforations of the music roll.

2. In a tracker for player pianos, the combination with the tracker bar having the usual note ducts and supplemental ducts located opposite the partitions between adjacent ducts and end ducts located in proximity to each end of the tracker bar, in a line with the note ducts and normally outside of the path of the travel of the edges of the music sheet and contiguous thereto, of means operated by the uncovering of the supplemental ducts located opposite the partitions between the note ducts and the covering of one of the end ducts of the bar designed to move the bar longitudinally to carry the note ducts into alinement with the perforations of the music roll, as and for the purpose specified.

3. In a tracker for player pianos, the combination with the tracker bar having the usual note ducts, and supplemental ducts located opposite the partitions between the adjacent note ducts and having end ducts located in proximity to the end of the tracker bar, in a line with the note ducts and normally outside of the path of travel of the edge of the music sheet and contiguous thereto and a main wind chest, of a valve box, pneumatics communicating therewith, and connected to the tracker bar and valves located in the valve box, and operated by the uncovering of the supplemental ducts, and the covering of one of the end ducts of the tracker bar thereby connecting the pneumatics to the main wind chest, and means consisting of a pair of tubes joining said valve box with a second lower valve box of similar construction which in turn communicates with a second set of pneumatics provided with means operating so as to move the tracker bar and the note ducts thereof into alinement with the perforations of the music roll, as and for the purpose specified.

4. In a tracker for player pianos, the combination with the tracker bar having the usual note ducts and supplemental ducts located opposite the partitions between adjacent note ducts and end ducts located in proximity to the end of the tracker bar, in a line with the note ducts and normally outside of the path of travel of the edge of the music sheet and contiguous thereto and a main wind chest, of a valve box having an upper and lower valve chamber therein, each divided into a vacuum chamber and a chamber open to the atmosphere, valves located between each vacuum chamber and the chamber open to the atmosphere, ducts leading from the supplemental ducts of the tracker bar to beneath the valves of the lower valve chamber, ducts leading from the end ducts of the tracker bar to beneath the valves of the upper chamber, means connected with the pneumatics of the upper chamber of the valve box, and operated by the raising of the valves of the said upper valve chamber, so as to open or close communication through ducts leading from the upper valve chamber to the lower valve chamber, pneumatics connected to the lower vacuum chamber and to the tracker bar and designed to be brought into communication with the vacuum chamber and main wind chest to move the tracker bar and the note ducts thereof into alinement with the perforations of the music roll, as and for the purpose specified.

5. In a tracker for player pianos, the combination with the tracker bar having the usual note ducts and supplemental ducts located opposite the partitions between adjacent note ducts and end ducts located in

proximity to the end of the tracker bar, in a line with the note ducts and normally outside of the path of travel of the edge of the music sheet and contiguous thereto and a main wind chest, of a valve box provided with an upper and lower valve chamber, each divided into a vacuum chamber connected with the main wind chest and a chamber communicating with the atmosphere, pneumatics supported at each end of each valve chamber, ducts communicating between the pneumatics and the vacuum chambers, a pair of pneumatically operated valves for each vacuum chamber designed to alternately connect each pneumatic with the vacuum chamber and the atmospheric chambers, ducts leading from the end ducts of the tracker bar to beneath the valves of the upper chamber, a slide valve operated by the upper pneumatics, ducts extending through the slide valve operated by the upper pneumatics, a supplemental wind chest,

tubes connecting the ducts of the slide valve with the supplemental wind chest, a duct leading from the supplemental wind chest to the supplemental ducts located between the note ducts of the tracker bar, ducts in the seat of the slide valve designed to alternately register with the slide valve ducts, and tubes connecting the ducts of the slide valve seat to the ducts leading beneath the valves of the lower chamber, and a link and lever connection between the pneumatics of the lower valve chamber and the tracker bar designed to move said bar and the note ducts thereof into alinement with the perforations of the music sheet when the supplemental ducts are uncovered, as and for the purpose specified.

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Witnesses:

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