C. W. DORRICOTT.

PNEUMATO ELECTRIC TRACKER BAR FOR MUSICAL INSTRUMENTS.

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1,078,133.

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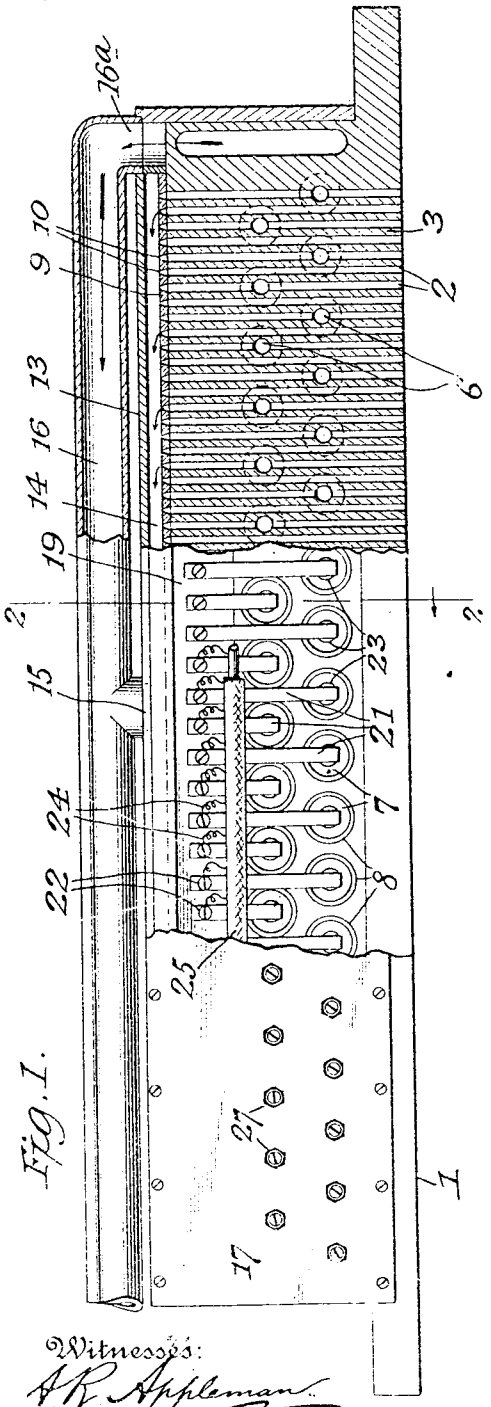


Fig. 1.

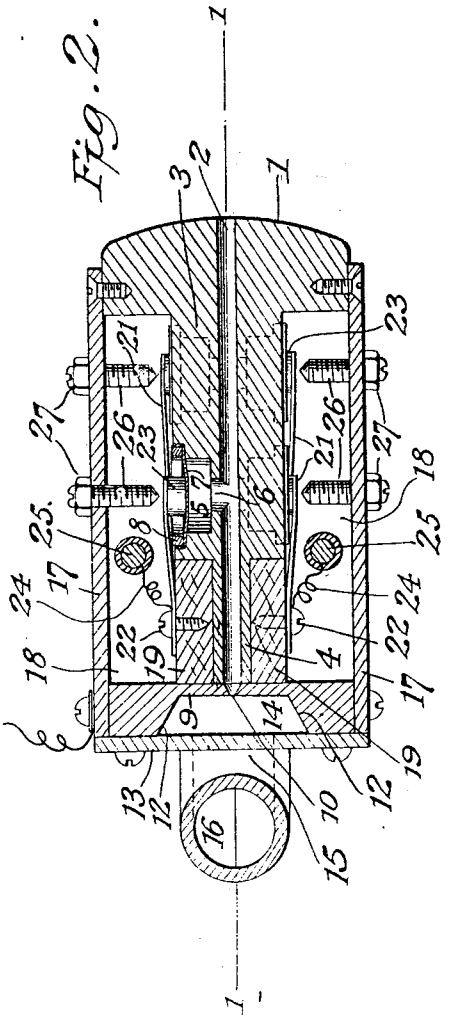


Fig. 2.

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UNITED STATES PATENT OFFICE.

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PNEUMATO-ELECTRIC TRACKER-BAR FOR MUSICAL INSTRUMENTS.

1,078,133. Specification of Letters Patent. Patented Nov. 11, 1913.

Application filed November 4, 1912. Serial No. 729,509.

To all whom it may concern:

Be it known that I, CHARLES W. DORRICOTT, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Pneumato-Electric Tracker-Bars for Musical Instruments, of which the following is a specification.

My present invention relates to certain new and useful improvements in pneumato-electric trackers, designed more especially for use in connection with electrically operated playing mechanism of musical instruments, such for instance as player pianos that are controlled by perforated music sheets, and one of the prime objects of my invention is to guard against fouling of the electrical contact members, resulting from dust accumulations thereon or therebetween, which fouling renders the contact members inoperative or incapable of properly closing the electric circuits leading to their associated electrically operated player actuating devices.

The present invention is in the nature of an improvement upon the pneumato-electric tracker shown and described in my pending application filed June 21, 1912, Serial Number 704,994.

I have discovered, after many experiments, that perhaps the most serious difficulty encountered in these pneumato-electric trackers results from the accumulation upon and between the electric contact members, of the fine particles of dust and lint coming from and through the perforated music sheets, as they travel over the tracker, and which foreign substances soon become carbonized by reason of the electric sparks resulting from the making and breaking of the electric circuits between the contact members, and when such carbonization takes place the contacts fail to properly transmit the electrical energy to the electrically operated playing mechanism, with the result that said mechanism fails to respond when called upon.

I have overcome the difficulty mentioned by housing the electrical contact-members in an air chamber or chest that is entirely separate from, and has no communication with, the tracker ducts, and by providing a separate air chamber or chest into which the bleed or vent holes from the electric contact-actuating pneumatics lead, and into which latter named chamber or chest all the dust particles passing through the tracker ducts will be collected. Provision is also made for readily cleaning this chamber or chest, as well as the vent or bleed holes, when necessary.

In the present embodiment of the invention I have shown my improvements all incorporated in and forming a part of a tracker bar structure that may be readily associated with bodily movable music roll holders of the type that are designed to be attached to the under side of the key-bed of a piano, so as to be moved from an operative position forward of the keys to an inoperative position back under the key-bed where the music roll holder will be out of view. I do not, however, wish to be understood as limiting myself to the exact embodiment shown, as I am well aware that the invention may take other forms than the one shown, and may be applied to other than bodily movable music roll holders.

In order to enable others skilled in the art to understand, make, and use my said invention, I will now proceed to describe the same in detail, reference being had for this purpose to the accompanying drawings, wherein—

Figure 1 is a view of the tracker partly in plan and partly in horizontal section, the section being taken in two planes to show different portions of the interior of the tracker structure. Fig. 2 is a transverse vertical section taken on the line 2—2 of Fig. 1.

Referring to the drawing reference numeral 1 designates the face plate of the tracker bar having the usual duct openings 2, the said face plate having a relatively thick web 3 extending from the rear face

thereof, said web terminating in a portion 4 of reduced thickness or width, and the tracker ducts 2 extending longitudinally through the web, there being as many tracker duct openings as there are notes to be sounded, or actuating devices 2 to be operated.

The tracker bar 1 and its web portions 3 and 4 are preferably, but not necessarily, formed of metal, and each of the opposite faces of the portion 3 of the web is provided with two rows of recesses or pockets 5, each of which recesses or pockets communicates by an opening 6 with one of the tracker ducts 2, as more clearly shown in Fig. 1. The recesses or pockets 5 are preferably counterbored and each is covered by a flexible diaphragm 7 held in place by means of a ring 8, the said rings 8 abutting the shoulder of the recesses formed by the counterbore. The recesses or pockets 5 and their diaphragms 7 constitute pneumatics for actuating the movable members of the electric contacts presently to be described. In order that the structure may be as compact as possible the rows of recesses or pockets 5 are offset relative to each other, as more clearly shown in Fig. 1.

Abutting the rear end of the reduced portion 4 of the web of the tracker is a channel plate 9 provided with a row of tapered bleed or vent holes 10, there being one such vent or bleed hole for each of the tracker ducts 2. Secured to the side walls 12 of the channel plate 9 is a rear cover plate 13, the space bounded by said channel plate 9 and cover plate 13 constituting what I shall term a bleed chamber 14, which chamber has communication by means of a pipe 15 and conduit 16, with any suitable exhaust apparatus, such as the well-known exhaust pump usually employed in connection with pneumatic instruments.

The reference numerals 17 designate respectively the side plates of the tracker which are secured along their longitudinal edges to the opposite walls of the face plate 1 of the tracker, and the side walls 12 of the channel plate 9, respectively, the spaces between said plates 17 and the opposite faces of the web portions 3 and 4 of the tracker constituting a divided air chest or chamber 18, the divisions of which have communication with each other at one end of the tracker, as more clearly shown in Fig. 1, and which chamber 18 has communication with the conduit 16 by means of the pipe 16^a. The chamber 18, as well as the chamber 14, will, therefore, always be maintained under air tension or exhaust, and inasmuch as the bleed or vent holes 10 for the pneumatics do not communicate with the chamber or chest 18, none of the dust particles passing through the tracker ducts 2 can find their way into said chamber or chest, but will be discharged into the chamber 14 where the dust accumulations can be readily removed by removing the end plate 13. When the plate 13 is removed the bleed or vent openings 10 will be exposed, and these may also be readily cleaned. It is also possible with my construction to remove the channel plate 9, in which the bleed or vent holes are formed, to enable these holes to be cleaned.

Secured to each side of the reduced portion 4 of the web of the tracker is a strip 19 of wood or other insulating material, and to the outer face of each of said strips is secured a plurality of movable contact fingers preferably made of thin strips of spring metal 21, there being one such movable contact finger for each of the pneumatics. These movable contact fingers are each secured at one end by means of a screw 22 to its strip 19, the other end overlying a disk or button 23 secured to the upper face of the diaphragms 7. The movable contact fingers 21 are in circuit with the electrical playing mechanism (not shown), by means of the wires 24 leading from each of the said contact fingers, the said wires 24 being bunched in cable sections 25, which cable sections are arranged within the chamber 18 of the tracker, as more clearly shown in Fig. 1.

Coöperatively associated with the free end of each of the movable contact fingers 21 is a stationary, but adjustable, contact pin 26, the lower end of which is preferably pointed and overlies, but is spaced from, the said free end of the movable contact finger, two rows of said pins passing through and having threaded connection with each of the removable walls 17 of the tracker, and each pin having an end exposed outside the tracker bar that is provided with a screw-driver notch, or other tool engaging portion, whereby it may be readily turned to bring its inner end in proper coöperative adjustment with its associated movable contact finger without opening the tracker, a lock-nut 27 being threaded on the exposed end of each pin to set the same after adjustment has been made. By reason of this construction the various contacts may be properly adjusted after the tracker parts have been assembled, and adjustment may also be made from time to time as occasion may require.

A tracker constructed in accordance with the present invention is very compact; can be manufactured at relatively low cost; is not liable to have its contact members become fouled or carbonized by reason of dust accumulations thereon or therebetween; and the contact members may be easily and quickly adjusted from without the tracker; all of which are considerations of the greatest importance in structures of this kind where practicability depends almost entirely

upon proper actuation at all times of the contact members and of each and every such member embodied in the structure, it being perfectly apparent to those skilled in the art that failure in the operation of even one of the contact members of a series will render the entire instrument faulty.

What I claim is:—

1. In a pneumato-electric tracker, a tracker-bar having the usual tracker-ducts, a plurality of pneumatics, one communicating with each duct, an air chamber in which said pneumatics are exposed, said chamber having no communication with the tracker ducts, coöperating electrical contacts in said chamber some of which are adapted to be actuated by said pneumatics, a bleed chamber, and vent or bleed passages leading from the tracker ducts into said bleed chamber.

2. In a pneumato-electric tracker, a tracker-bar having the usual tracker-ducts, a plurality of diaphragm pneumatics, one communicating with each duct, an air chamber in which the said diaphragm pneumatics are exposed, said chamber having no communication with the tracker ducts, electric contact fingers in said chamber adapted to be actuated by said pneumatics, electric contact members with which said fingers coöperate, a bleed chamber carried by the tracker and vent or bleed passages leading from the tracker ducts into said bleed chamber.

3. A pneumato-electric tracker comprising a tracker-bar having a web extending from the rear wall thereof, said bar and web having tracker ducts extending therethrough, each duct having a lateral opening terminating in an enlarged recess covered by a flexible diaphragm, a chamber having no communication with the tracker ducts, electrical contact members arranged within said chamber and adapted to be brought into electrical connection by the bulging or lateral movement of the diaphragms from pneumatic action, a separate bleed-chamber forming a part of the tracker structure, and vent or bleed passages leading from the tracker-ducts into said bleed-chamber.

4. A pneumato-electric tracker comprising a hollow-member having the usual tracker ducts and an air chamber therein, said ducts having no communication with the chamber, a plurality of movable contact members mounted within the said chamber, pneumatics for actuating said contact members, said pneumatics being located within the tracker and having communication with said ducts, a plurality of fixed contacts projecting through an outer wall of the tracker, said contacts being adjustably mounted for coaction with the said movable contact members, a bleed-chamber forming a part of the tracker structure, and vent or bleed passages leading from the tracker ducts into said bleed chamber.

5. A pneumato-electric tracker comprising a hollow member having the usual tracker ducts, and an air chamber, said ducts having no communication with the chamber, a bleed chamber having bleed openings leading therein from the said tracker ducts, said bleed chamber being separate from the air chamber, a plurality of movable contact members located within the said air chamber, pneumatics for actuating said contact members, said pneumatics being located within the tracker and having communication with said ducts, a plurality of fixed contact pins projecting through an outer wall of the tracker into the said air chamber for coaction with the movable contact members, and means for adjustably supporting said fixed contact pins.

6. A pneumato-electric tracker comprising a tracker-bar having a web extending from the rear wall thereof, the rear portion of said web being of reduced thickness, said bar and web having tracker ducts extending therethrough, each duct having a lateral opening terminating in an enlarged recess covered by a flexible diaphragm, strips of insulating material supported by the reduced portions of the web, a chamber having no communication with the tracker ducts, movable contact members arranged within the chamber and each secured at one end to one of said strips and having its free end overlying one of the diaphragms to be actuated thereby, fixed contact members coöperating with said movable contact members and having portions thereof exposed outside the tracker for adjustment, a bleed chamber forming a part of the tracker structure, and vent or bleed passages leading from the tracker ducts into said bleed chamber.

7. A pneumato-electric tracker comprising a tracker-bar having a web extending from the rear wall thereof, the rear portion of said web being of reduced thickness, said bar and web having tracker ducts extending therethrough, each duct having a lateral opening terminating in an enlarged recess covered by a flexible diaphragm, strips of insulating material supported by the reduced portions of the web, a chamber having no communication with the tracker ducts, movable contact members arranged within the chamber and each secured at one end to one of said strips and having its free end overlying one of the diaphragms to be actuated thereby, fixed contact members cooperating with said movable contact members, and having portions thereof exposed outside the tracker for adjustment, a channel plate extending longitudinally of the tracker at the rear thereof, said channel

plate having bleed-openings registering with the several tracker ducts, a cover for said channel plate providing a bleed chamber, and an exhaust conduit having communication respectively with the said bleed and diaphragm chambers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES W. DORRICOTT.

Witnesses:

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JOHN L. CORNOG.