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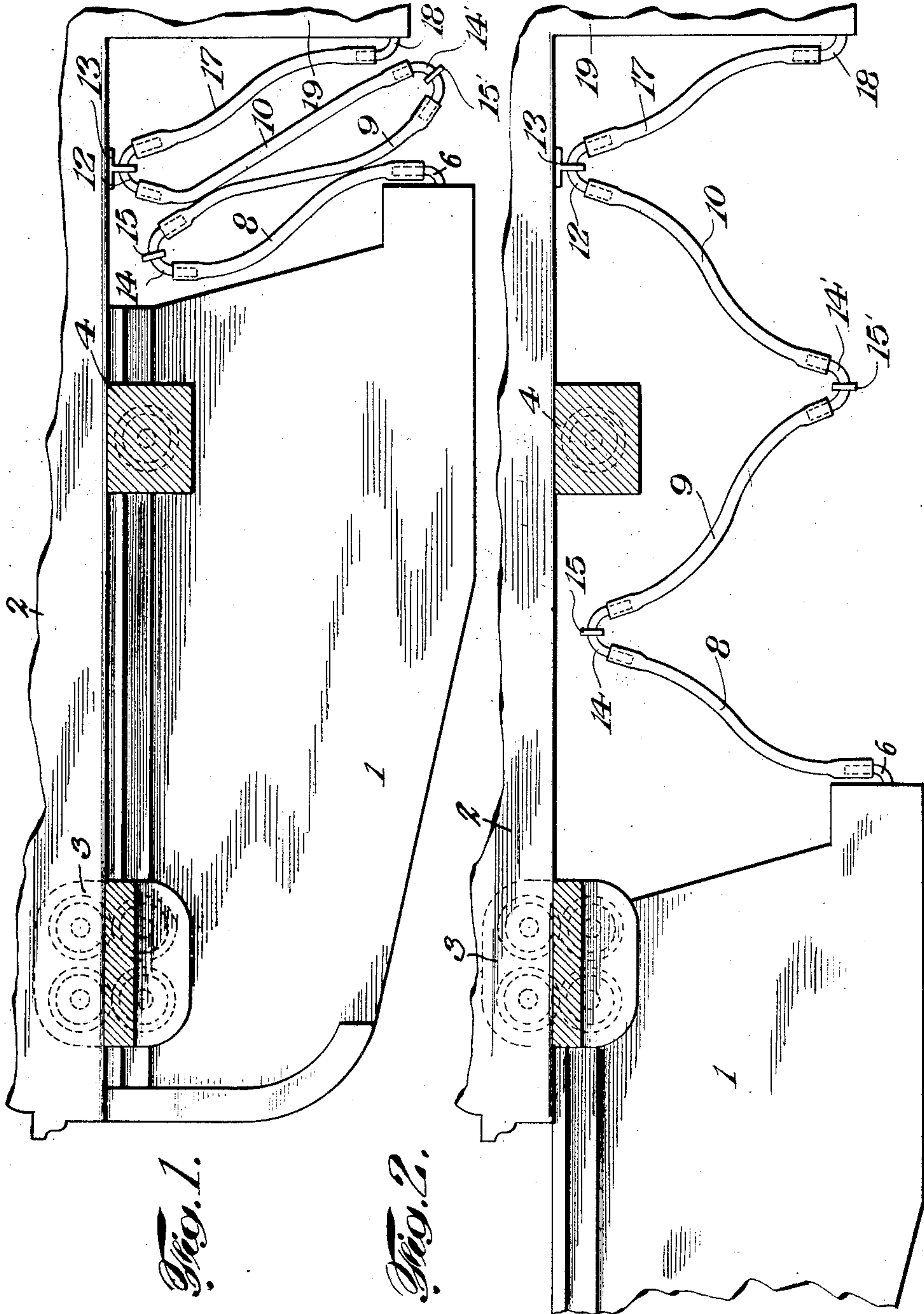
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TUBING ARRANGEMENT FOR AUTOMATIC PNEUMATIC PIANOS

Filed June 4, 1927

2 Sheets-Sheet 1



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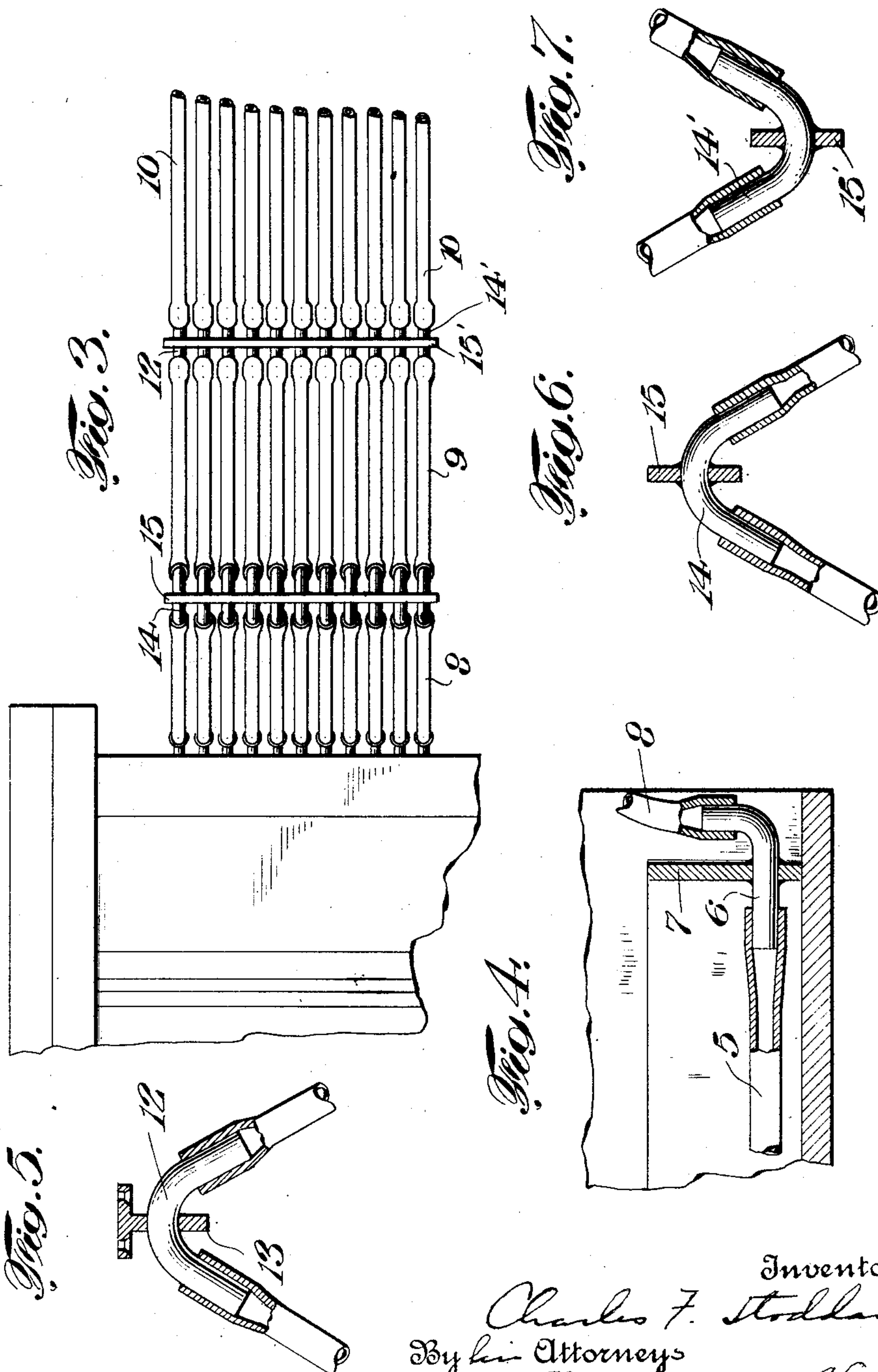
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## UNITED STATES PATENT OFFICE

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## TUBING ARRANGEMENT FOR AUTOMATIC PNEUMATIC PIANOS

Application filed June 4, 1927. Serial No. 196,407.

This invention relates to automatic pneumatic pianos and pertains more particularly to arrangements for effecting pneumatic communication between the sliding drawer and pneumatic stack of such pianos.

In pneumatic pianos, and more particularly, in grand pianos, it is customary to place the pneumatic stack, comprising the striker pneumatics and their controlling valves, in the body of the piano in position for connection to the hammer actuating mechanisms, while the tracker bar, the note sheet rolls, the motor which drives said rolls and other accessory controlling mechanisms are frequently placed in a drawer mounted to slide beneath the keybed of the piano. Thus when it is desired to insert or remove a note sheet, the drawer may be pulled forward from beneath the keybed, but during the playing of the selection, or when the piano is not in use or when it is being played manually, the drawer may be pushed back under the keybed.

In order to provide pneumatic communication between the vents of the tracker bar and the various units of the pneumatic stack, flexible tubing is frequently used, but due to the severe and repeated bending to which it is subjected, such tubing deteriorates rapidly, particularly at points where the bending is pronounced, and needs frequent replacement. It is an object of this invention to provide composite tubing comprising alternate sections of flexible and non-flexible material, the said non-flexible sections being shaped to provide relatively sharp bends in the tubes, and the said flexible sections being connected thereto in a manner to permit the drawer to be moved in and out without excessive bending thereof. It is also an object to support said tubing in such manner that it shall not be visible in either position of the drawer.

Other objects and advantages of the invention will appear hereinafter.

A preferred embodiment of the invention selected for purposes of illustration is shown in the accompanying drawings, in which,

Figure 1 is a side elevation showing the drawer under the keybed, Figure 2 is a similar view showing the drawer in its open position, Figure 3 is a fragmentary bottom

plan view, and Figure 4 is a detail view showing the connection of the tubes to the drawer. Figure 5 is a detail view showing a connection to the key bed, and Figures 6 and 7 are detail views of the bent nipples.

Referring to the drawings, the drawer 1 is slidably mounted beneath the keybed 2 and may be supported on the rollers 3 and 4 in the usual manner. The drawer contains the usual tracker bar (not shown) and connected to the usual metal tube leading from each vent of the tracker bar is a rubber tube 5 which is connected to a series of nipples 6 preferably of metal which pass through the partition 7 at the back of the drawer. Connected to each of the nipples 6 is a flexible tube 8 preferably of rubber which in turn is connected through the flexible tubes 9 and 10 to the nipple 12, preferably of metal, which is fixed to the keybed of the piano by means of the bar 13.

Between the flexible tubes 8 and 9 and connecting the same are a series of bent nipples 14, preferably of metal, which pass through and are rigidly attached, as by soldering, to the bar 15. Similarly, between the flexible tubes 9 and 10 is located a similar series of bent nipples 14' also preferably of metal which are rigidly connected and held together by the bar 15'. The bars 15 and 15' have no connection whatever with either the drawer or the piano casing and receive no support therefrom, but due to the shape and arrangement of the nipples 14 and 14', the rubber tubing is caused to assume a zigzag conformation which prevents it from sagging beneath the drawer so as to become visible.

Connected to each of the nipples 12 is a tube 17 which is also connected to the nipples 18 which pass through the partition 19 for connection to the valve units of the pneumatic stack.

Thus there is provided beneath the nipples 6 and the nipples 12 a series of composite tubes made up of alternate sections of flexible and non-flexible material. As will be observed from a comparison of Figures 1 and 2 wherein the two extreme positions of the drawer are illustrated, the provision of the bent non-flexible sections relieves the flexible



sections of much of the bending to which they would otherwise be subjected, the bends in the flexible sections being relatively easy curves in both positions.

5 It will also be observed that due to the arrangement disclosed in Figure 1 whereby in the closed position of the drawer the nipple 6 is located substantially in the same transverse vertical plane as the nipple 12, and  
10 whereby, in effect the folds of tubing are telescoped one over another the drawer is permitted considerable travel from closed to open position without undue bending of the flexible sections of the tubes. Due to the  
15 stiffness imparted to the rubber tubing by the bent nipple insertions and by the connecting bars, the zigzag folds in which the tubing is originally arranged are retained in all positions of the drawer and the tubing  
20 is supported above the level of the bottom of the drawer so that it is not visible from the outside.

It will be understood that the invention may be variously modified and embodied  
25 within the scope of the subjoined claims.

I claim as my invention:

1. In an automatic pneumatic piano having a slidable drawer and a pneumatic stack, a plurality of flexible tubes affording pneumatic communication between said drawer and stack, and means forming part of said tubes for maintaining a zigzag conformation thereof at all times.

2. In an automatic pneumatic piano having a slidable drawer and a pneumatic stack, a plurality of flexible tubes affording pneumatic communication between said drawer and stack, and means providing internal support for said tubes adapted to maintain a predetermined conformation therein limiting sagging thereof.

3. In an automatic pneumatic piano having a slidable drawer and a pneumatic stack, a plurality of tubes affording pneumatic communication between said drawer and stack, said tubes each comprising flexible sections and non-flexible sections, the non-flexible section being bent to maintain a zigzag conformation in said tubes at all times.

4. In an automatic pneumatic piano having a slidable drawer and a pneumatic stack, a plurality of tubes affording pneumatic communication between said drawer and stack, said tubes each comprising flexible sections and non-flexible bent nipples, the said nipples being bent to maintain a zigzag conformation in said tubes at all times.

5. In an automatic pneumatic piano having a slidable drawer and a pneumatic stack, a plurality of tubes affording pneumatic communication between said drawer and stack, said tubes each comprising flexible sections and non-flexible sections, the non-flexible sections being bent to maintain a zigzag conformation in said tubes at all times, and

means to rigidly connect said non-flexible sections.

6. In an automatic pneumatic piano having a slidable drawer and a pneumatic stack, a plurality of tubes affording pneumatic communication between said drawer and stack, said tubes each comprising flexible sections and non-flexible bent nipples, the said nipples being bent to maintain a zigzag conformation in said tubes at all times, and means to rigidly connect said nipples.

In testimony whereof, I have signed my name to this specification this 20th day of May, 1927.

CHARLES F. STODDARD.