E. BÖCKER.

AUTOMATIC MUSICAL INSTRUMENT.

APPLICATION FILED SEPT. 29, 1913.

1,222,722.

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Fig. 1.

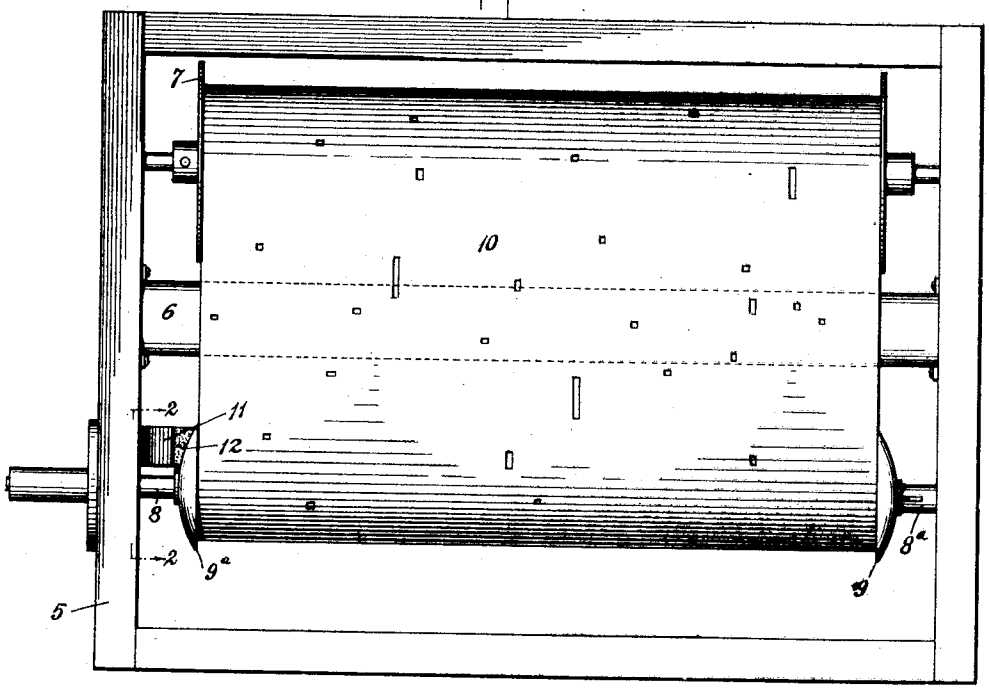


Fig. 2.

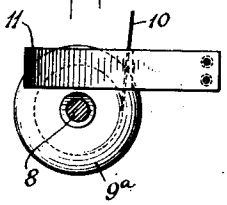


Fig. 5.

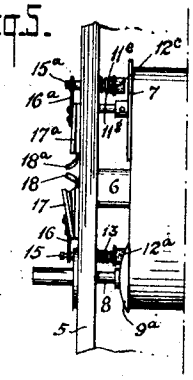


Fig. 3.

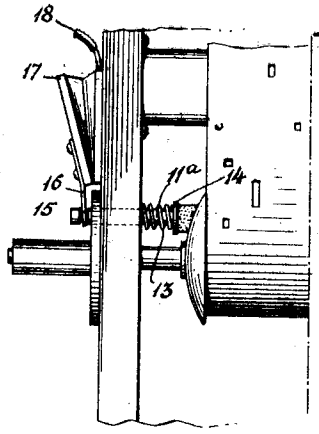
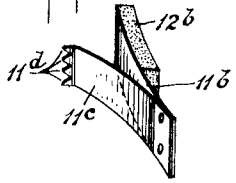


Fig. 4.



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AUTOMATIC MUSICAL INSTRUMENT.

1,222,722. Specification of Letters Patent. Patented Apr. 17, 1917.

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To all whom it may concern:

Be it known that I, ERNST BÖCKER, a citizen of the United States, and resident of the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Automatic Musical Instruments, of which the following is a specification.

My invention relates to automatic musical instruments of the kind in which a perforated note sheet travels over a tracker board or the like from one roll to another and has for its object to provide such instruments with a means whereby vibration of the said sheet is obviated or reduced to a minimum and said sheet is maintained in a constant path during its travel over the tracker board. Other objects of my improvement will appear from the description hereinafter and the features of novelty will be pointed out in the appended claims.

Reference is to be had to the accompanying drawings which by way of example show several forms of my improvement and in which Figure 1 is a front elevation of the tracker frame, rolls and music sheet with one form of my invention in operative position therein; Fig. 2 is a detail sectional view substantially on the line 2—2 of Fig. 1 looking in the direction of the arrows; Fig. 3 is a detail elevation of another form of my device; Fig. 4 is a perspective view of still another form of my invention, and Fig. 5 is a diagrammatic view of another arrangement of my idea.

In the drawings 5 represents the tracker frame of any suitable construction which forms a stationary part of the instrument and in which the tracker board 6 is rigidly secured in any customary manner. A take up roll 7 of any convenient type is rotatably mounted in the frame 5, which latter is further provided with the usual couplings 8 and 8^a with which any type of delivery roll 9 may be detachably connected so as to be rotatable in said frame 5. The take up roll 7 and the delivery roll 9, when the latter is in position in the instrument, are located on opposite sides of the tracker board 6 so that the usual perforated music sheet 10 may travel over the tracker board of the instrument from the roll 9 to the roll 7 during the playing of a selection, and vice versa during the re-roll in the customary manner. It is of course to be understood that any usual mechanism may be utilized to drive the rolls 7 and 9 during the playing of a selection and the re-roll respectively and that the music sheet 10 is normally carried by the delivery roll 9 in the well known way.

To maintain the music sheet 10 in close contact with the tracker board 6 during its passage thereover and in a constant path during operation of the instrument I provide a device which as shown in Figs. 1 and 2 consists of a resilient member 11 having its one end rigidly secured to the tracker frame 5 at a proper point and its free end in engagement with the one end surface of the roll 9 or with the outer surface of a flange 9^a which may form part of the delivery roll 9. In the preferred construction the said member 11 is provided at said free end with a cushion 12 of felt or other suitable material which cushion engages the said end of the roll 9 or the flange 9^a as shown best in Fig. 1. As illustrated in Fig. 3 the device comprises a plunger or member 11^a slidably mounted in the frame 5 and preferably provided at its one end with a cushion 12^a similar to the cushion 12 and similarly adapted to engage either the one end of the roll 9 or the flange 9^a thereof. A coil spring 13 surrounds the said plunger or member 11^a and bears with one end against the frame 5 and with its other end against a projection 14 rigidly carried by said member 11^a, the tendency of the spring 13 being to keep the cushion 12^a in engagement with the flange 9^a. At its inner end the plunger or member 11^a is provided with a preferably integral head or enlargement 15 which is engaged by a preferably forked member 16 forming part of or rigidly secured to the movable member of a pneumatic 17. This pneumatic 17 is mounted in proper position on the frame 5 and is connected by means of a tube 18 with an exhaust chamber in any usual manner and may be controlled in any desired way as for instance by a suitably located aperture in the music sheet 10. If desired the same aperture in the note sheet 10 which controls the re-roll mechanism may be utilized for the purpose of controlling the said pneumatic 17.

The form of my device shown in Fig. 4 comprises a member 11^b corresponding to the member 11 and having a cushion 12^b similar to the cushion 12, the one end of this member 11^b being rigidly secured to or forming an integral part of a second mem-

ber 11^e, which latter is formed with prongs or teeth 11^d at its free end. This form of device is located in the same position and manner as the form shown in Fig. 1 and is detachably placed in position when desired by simply forcing the prongs or teeth 11^d into the frame 5 in which position the cushion 12^b is adapted to bear against the flange 9^a as in the other forms described.

In Fig. 5 I have shown an arrangement in which the device shown in Fig. 3 is duplicated for each roll 7 and 9. In this form a second member 11^e corresponding to the member 11^a is slidably mounted in the frame 5 and preferably also carries a cushion 12^c adapted to engage the one end surface of the take up roll 7 or a surface of a flange thereof. This member 11^e is also spring pressed toward the roll 7 by means of a spring 11^g and is operatively connected with a pneumatic 17^a through the medium of a projection 15^a and preferably forked member 16^a. The pneumatic 17 in this form may be controlled and operated in the same manner as in Fig. 3, while the pneumatic 17^a may similarly be connected with an exhaust chamber by means of a tube 18^a and controlled and actuated in any suitable way as for instance through the medium of a suitably placed aperture in the note sheet 10. Whatever means is used to control and actuate the pneumatics 17 and 17^a the arrangement is such that the pneumatic 17^a will be collapsed when the pneumatic 17 is expanded and vice versa. In this way the member 11^a will exert a pressure on the roll 9 during the playing of a selection, the roll 7 being meanwhile free from the influence of the member 11^e, while during the re-rolling operation the roll 7 will be under the influence of the member 11^e and the roll 9 will not be engaged by the member 11^a.

In all of the forms illustrated and described the cushions 12, 12^a and 12^b exert a pressure on the flange 9^a during the playing of the instrument and thus frictionally retard the travel of the music sheet 10 as the latter is being wound upon the take up roll 7 which during this operation is the driven roll. In this manner the passage of the sheet 10 over the tracker board 6 is retarded and said sheet is stretched taut upon said tracker board 6 and in consequence maintained in close contact therewith. At the same time the pressure exerted by the various members 11, 11^a and 11^b tends to force the roll 9 toward the coupling 8^a and to maintain it in close engagement therewith against any lateral movement. The said roll 9 thus rotates without vibration in an axial direction and the sheet 10 consequently travels in a straight constant path and is held against any lateral or other vibration with the result that a perfect rendition of the selection is secured. Similarly, when the form shown in Fig. 5 is used, the member 11^e will exert a pressure on the roll 7 at the proper time and will thus maintain this roll against any movement in an axial direction. The note sheet may thus be rewound tightly upon the delivery roll and a perfect rewinding secured.

In the form shown in Figs. 1 and 2 the pressure of the cushion 12 is constant even during the re-roll while in the form shown in Fig. 3 the pressure of the cushion 12^a may be removed from the flange 9^a during the re-roll by collapsing the pneumatic 17 for instance, through the medium of a suitably located aperture in the note sheet 10 at the time the re-rolling operation is to commence. This collapsing of the said pneumatic 17 will cause the member 16 to exert a pressure to the left in Fig. 3 on the projection 15 and will in consequence move the plunger or member 11^a against the tension of the spring 13 and the cushion 12^a away from the flange 9^a so that the roll 9 will accordingly be free from the influence of the cushion 12^a during the re-rolling of the note sheet 10. In the same way, if desired the combined members 11^b, 11^c may be bodily taken out of the instrument just prior to the re-roll to free the flange 9^a and consequently the roll 9 from the effects of the pressure exerted by the cushion 12^b during the re-rolling operation.

In Fig. 5 the pressure of the cushion 12^a will be removed from the roll 9 and the cushion 12^c permitted to engage the roll 7 through an actuation of the pneumatics 17 and 17^a as will be readily apparent from the illustration and the description hereinbefore. With this arrangement the note sheet is retarded and maintained in a constant path both during the playing of the selection and the re-rolling of the sheet.

Either form of my improvement if utilized will neutralize any physical changes which may take place from any cause in the roll 9 or the note sheet 10 and will insure a perfect operation of the note sheet and in consequence a perfect rendition of the selection and if the form in Fig. 4 is used also a perfect re-roll of the said sheet under all conditions. My improvement as shown is simple in construction and effective in operation and is not likely to become deranged and does not in any way injure the delivery roll or the note sheet or any other parts of the mechanism.

It is of course to be understood that the forms shown are only examples of my invention and that any equivalent device may be used which will accomplish the desired results and further that any type of tracker board or equivalent arrangement may be utilized, the term tracker board as used in the claims being used in the broad sense to include all devices operating in conjunction

with a note sheet to bring about an actuation of a musical instrument.

Various changes in the construction shown and described may be made within the scope of the claims without departing from the spirit of my invention.

I claim:—

1. In an automatic musical instrument, the combination of a support, a music roll rotatably carried thereby and means adapted to engage an end of said roll to exert a pressure thereon in an axial direction whereby said roll is retarded and held against axial vibration, said means being a separable unit detachably combined with said support so as to be removable from said instrument.

2. In an automatic musical instrument, the combination of a support, a music roll rotatably carried thereby and a resilient unit adapted to be detachably clamped by its own resiliency between said support and an end of said roll and to exert a pressure upon said end in an axial direction whereby said roll is retarded and held against axial vibration.

3. In an automatic musical instrument, the combination of a support, a music roll rotatably carried thereby, a pair of members connected together at one end and diverging from said end, prongs at the free end of one member whereby said members may be detachably secured between said support and an end of said roll and a cushion carried by the other member and adapted to bear against said end whereby said roll is retarded and held against axial vibration.

4. A device for retarding the rotation of music rolls and for preventing axial vibration thereof comprising a unit consisting of resilient members connected at one end, means carried by one of said members for detachably securing the unit in operative position and a cushion carried by the other member.

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

ERNST BÖCKER.

Witnesses:
PAUL PRASSEDA,
KATE SCHEER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."