F. G. LYNDE. SHEET ADJUSTING DEVICE FOR MECHANICAL MUSICAL INSTRUMENTS. APPLICATION FILED DEC. 15, 1910.

1,008,976.

Patented Nov. 14, 1911.



## UNITED STATES PATENT OFFICE.

## FRANK G. LYNDE, OF NEW YORK, N. Y.

SHEET-ADJUSTING DEVICE FOR MECHANICAL MUSICAL INSTRUMENTS.

1,008,976.

Specification of Letters Patent. Patented Nov. 14, 1911. Application filed December 15, 1910. Serial No. 597,511.

To all whom it may concern:

Be it known that I, FRANK G. LYNDE, a citizen of the United States, residing in the borough of Manhattan of the city of New 5 York, in the State of New York, have in-

vented certain new and useful Improvements in Sheet-Adjusting Devices for Mechanical Musical Instruments, of which the following is a specification, reference being had to 10 the accompanying drawing, forming a part

hereof. This invention has for its object to provide improved devices for effecting lateral adjustment of the perforated music sheet of

- 15 a mechanical musical instrument to preserve the registry of its perforations with the ducts of the tracker board. One purpose in view is to make the sheet adjusting devices very sensitive, so that they will respond
  20 quickly to very slight shifts of the music
- 20 quickly to very slight shifts of the music sheet out of proper position; another purpose is to reduce to a minimum the wear upon the edge of the music sheet in the operation of the sheet adjusting devices; and

25 another purpose is to permit the music sheet to be freed from contact with the sheet adjusting devices during the rewind. The invention will be more fully ex-

The invention will be more fully explained hereinafter with reference to the 30 accompanying drawing in which it is illus-

trated and in which— Figure 1 is a view partly in elevation and partly in section showing so much of the tracker box of a pneumatic piano player as

- tracker box of a pneumatic piano player asis necessary to enable the application of the invention to be understood. Fig. 2 is a detail view on a larger scale of a portion of the devices shown in Fig. 1.
- The perforated music sheet a, arranged to 40 coöperate in the usual manner with the tracker board b, is wound upon a spool cwhich is mounted in the frame d of the tracker box in such manner as to be capable of adjustment laterally with respect to the
- 45 music sheet, that is, longitudinally with respect to the axis of the roll itself. From the spool or roll c the music sheet passes to the winding-on roll e which is also mounted in the frame d of the tracker box but is not
- 50 necessarily capable of lateral adjustment. The two rolls are driven, in the wind and in the rewind, by any usual or suitable mechanism which need not be particularly described or explained herein. One end of the

55 roll c is mounted in a yielding, spring box placed a double piston value n,  $n^*$ , the two f of usual construction, by which the roll c parts of which are separated by an annular

is pressed normally in one direction, but is permitted to yield when pressed in the opposite direction. At the other end the roll cis supported by a driving shaft g which is 60 capable of limited longitudinal movement in its bearing and may be moved, to effect, in coöperation with the spring bearing box f, the required lateral movement of the music sheet to correct its alinement with respect 65 to the tracker board b. Any usual or suitable means for effecting the required longitudinal movement of the shaft g may be employed.

As shown in the drawing a swiveled box 70 g' on the end of the shaft g supports a roller  $g^2$  which bears against a vertically movable cam h. The latter is mounted upon or formed with a rod h' which is guided in a suitable bearing  $h^2$  at its upper end and at 75 its lower end is connected to a double piston  $h^3$ ,  $h^4$ . The latter is arranged in a cylinder *i* which is provided in its middle portion, between the two pistons  $h^3$ ,  $h^4$ , with one or more openings i' so that the proximate faces 80 of the pistons  $h^3$ ,  $h^4$ , are subject alike to atmospheric pressure and the piston is therefore balanced normally. The end chambers  $i^2$  and  $i^3$  of the cylinder *i*, however, are separately connected with the vacuum system of 85 the player, which is sufficiently represented by the pipe k, through suitable pipe connections  $i^4$ ,  $i^5$  and controlling pneumatics  $i^9$ ,  $i^7$ , which are of usual construction. The pneumatics  $i^{\circ}$  and  $i^{\tau}$  are controlled, so as to effect '90 the connection of one end  $i^2$  or the other end  $i^3$  of the cylinder i with the vacuum system, by devices actuated by the displacement of the edge of the music sheet, so that the slightest disalinement of the music sheet 95 produces a correcting movement of the roll c through movement of the cam h in one directhough movement of the can n in one direc-tion or the other. For this purpose, each of the pneumatics  $i^{\circ}$  and  $i^{\tau}$ , is connected by a tube m',  $m^2$ , with a small cylinder m 100 which is supported in convenient proximity to one edge of the music sheet a. The cylinder m is open to atmospheric pressure at one end, as at  $m^3$ , and is closed at the other end, as at  $m^4$ , the chamber  $m^5$  at the closed 105 end of the cylinder being connected with the vacuum system, which is sufficiently indicated by the pipe  $m^6$ . The cylinder is also provided with somewhat widely separated ports  $m^7$  and  $m^8$ . In the cylinder *m* is 110 placed a double piston value  $n, n^*$ , the two

recess  $n^2$  which is slightly narrower than the distance between the two ports  $m^{\tau}$  and  $m^{s}$ of the cylinder, so that when the piston valve is in normal or middle position both 5 ports are closed. The connections m' and  $m^2$ , above referred to, are also connected into the wall of the cylinder m, preferably in

line, respectively, with the ports n and n'. The piston valve is connected by a stem  $n^3$ 10 with a plate or detector  $n^4$  against which the edge of the music sheet bears. The plate  $n^4$ 

- may also be provided with an indicating finger  $n^5$  to show when the detector and the valve are in middle position.
- It will now be seen that when the music 15 sheet a is displaced, for example, to the right, the port  $m^{s}$  and the connection m'will be uncovered by the valve head n and air under atmospheric pressure will be ad-
- 20 mitted to the pneumatic  $i^{\tau}$  which will establish connection between the pipe  $i^5$  and the vacuum pipe k. This will cause the double piston  $h^{\hat{s}}$ ,  $\hat{h}^{\hat{s}}$  to be pulled down and the cam h will therefore press the spool c to the left,
- 25 against the pressure of the spring box f, thereby correcting the alinement. Simi-larly if the music sheet is displaced to the left, the cam will be caused to move upward and the spring box f will then be free to 30 move the roll to the right to correct the alinement. The detector  $n^4$  is made to fol-
- low the edge of the music sheet and is held against the same with a light pressure, through the connection of the pipe  $m^6$  to 35 some part of the vacuum system in which
- the vacuum is low, and in which, by usual and suitable devices not necessary to be shown herein, the vacuum is destroyed dur-ing the rewind. The pressure of the detec-
- 40 tor against the edge of the sheet is therefore very light during use and may be removed entirely, if desired, during the rewind, so that the wear on the edge of the music sheet is very slight.
- For adjustment of the detector to suit dif-45 ferent conditions, the cylinder m is supported upon a screw o which is suitably mounted in the frame d of the tracker box and is provided with an adjusting head o'.

It will be understood that various changes 50 in details of construction and arrangement may be made to suit different conditions of use and that the invention, therefore, is not limited to the particular construction and 55 arrangement shown and described herein.

I claim as my invention:

1. The combination with a tracker box mechanism having a longitudinally movable .

shaft for the music roll, of a cylinder connected at each end to the vacuum system 60 and open to the atmosphere in its middle portion, a double piston in said cylinder. means actuated thereby to shift the music roll, pneumatics to control the connection of the cylinder ends with the vacuum system 65 and devices actuated by the shifting of the music sheet to control said pneumatics.

2. The combination with a tracker box mechanism having a longitudinally movable shaft for the music roll, of a pneumatic de- 70 vice to shift the music roll, pneumatics to. control the connection of said device with the vacuum system, a valve cylinder supported adjacent to the edge of the music sheet, connections therefrom to said pneu- 75 matics, a valve piston in said cylinder, and a detector connected with said piston and adapted to be shifted by the displacement of the edge of the music sheet.

3. The combination with a tracker box 80 mechanism having a longitudinally movable shaft for the music roll, of a pneumatic device to shift the music roll, pneumatics to control the connection of said device with the vacuum system, a valve cylinder sup- 85 ported adjacent to the edge of the music sheet, connections therefrom to said pneumatics, a valve piston in said cylinder, a de-tector connected with said piston and adapted to be shifted by the displacement of the 90 edge of the music sheet, and a connection from said cylinder to the vacuum system whereby the detector is pressed toward the edge of the music sheet.

4. The combination with a tracker box 95 mechanism having a longitudinally movable shaft for the music roll, of a pneumatic device to shift the music roll, separate connections from the vacuum system to said pneumatic device to actuate the same in opposite 100 directions, separate pneumatics to control said connections, a valve cylinder supported adjacent to the edge of the music sheet and having separated air ports, separate connec-tions from said cylinder to said pneumatics, 105 a double valve piston in said cylinder to control the connections to said pneumatics, and a detector connected with said piston and adapted to be shifted by the displacement of the edge of the music sheet. 110

This specification signed and witnessed this 14th day of December, A. D. 1910.

FRANK G. LYNDE.

Signed in the presence of-Ambrose L. O'Shea, ELLA J. KRUGER.