F. G. LYNDE.

MAGNETIC TRACKING DEVICE.

APPLICATION FILED JAN. 28, 1915.

1,167,087. Patented Jan. 4, 1916.

Fig. 1.

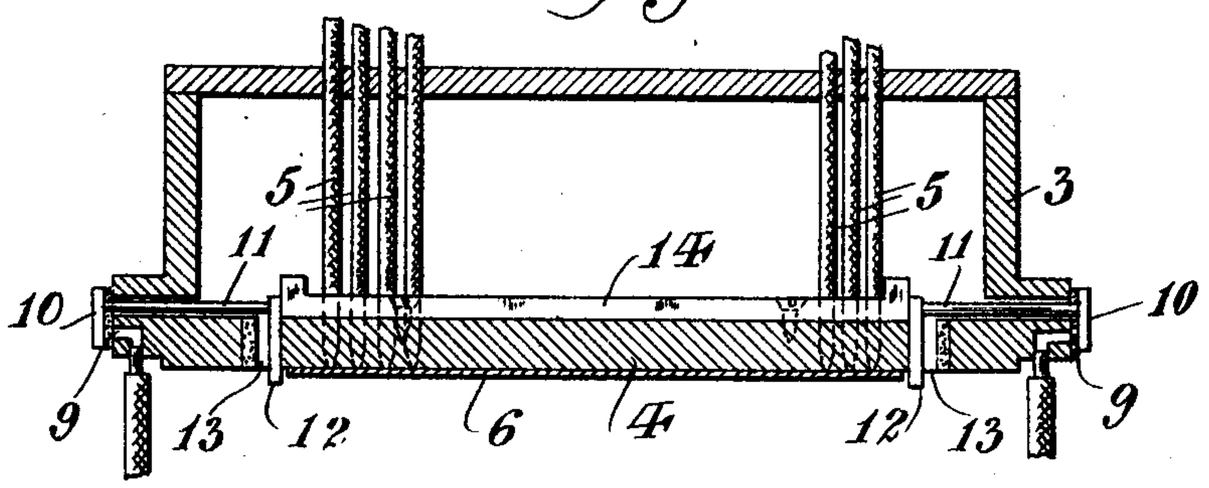
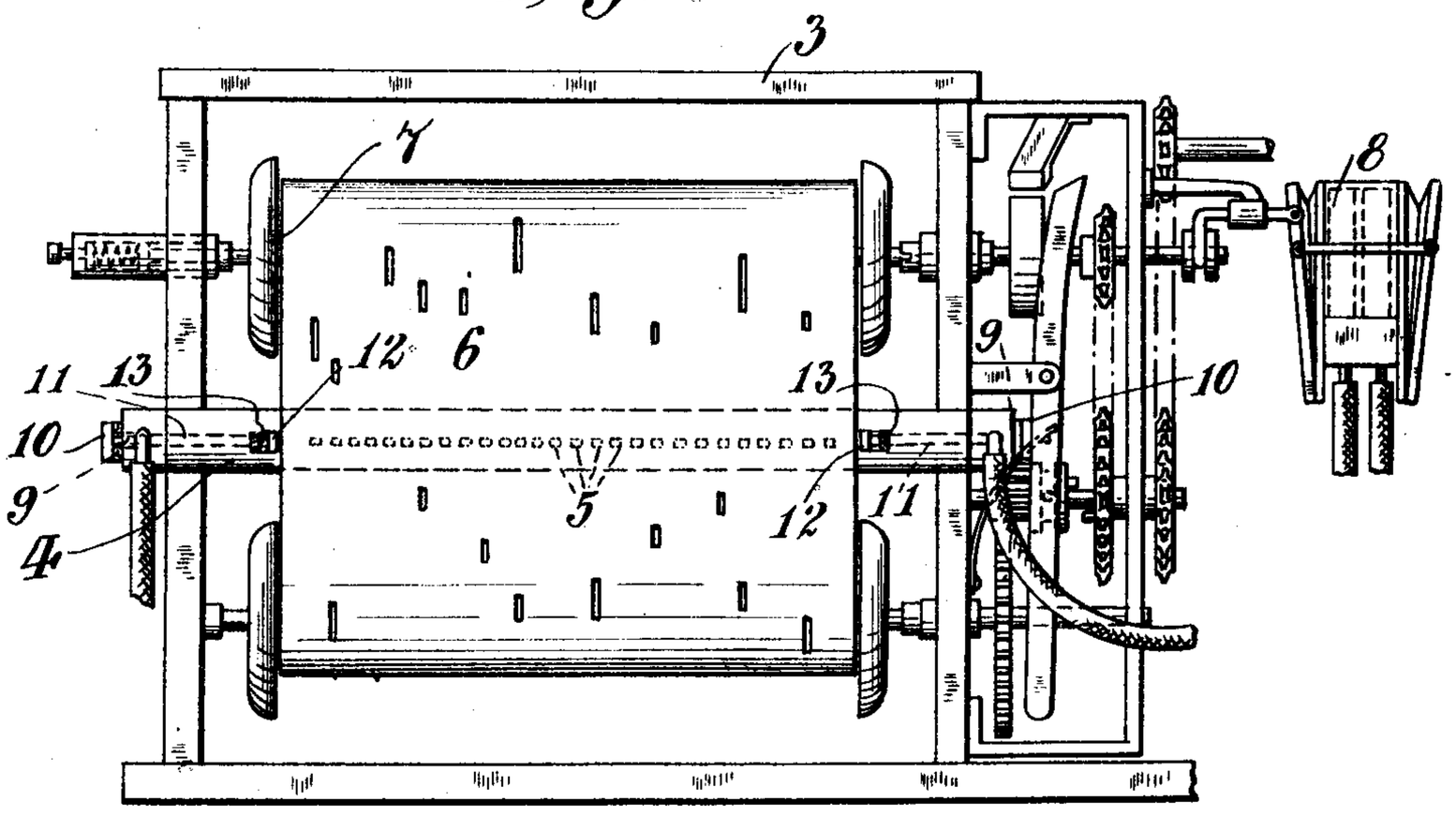


Fig. 2.



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MAGNETIC TRACKING DEVICE.

1,167,087. Specification of Letters Patent. Patented Jan. 4, 1916.

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To all whom it may concern:

Be it known that I, FRANK G. LYNDE, a citizen of the United States, residing in Newark, county of Essex, and State of New Jersey, have invented certain new and useful Improvements in Magnetic Tracking Devices, of which the following is a specification.

My invention relates to improvements in tracking devices for maintaining coöperative registry of the perforations in music sheets with the vents in the tracker-bar of player pianos.

One of the objects of my invention is to provide a simple form of valve closing means in pneumatically actuated tracking devices, which means will cause the least possible wear on the traveling sheet, which will be instantly responsive to any lateral wandering of the sheet and which will be free of any necessity to repair, adjust or replenish any of the parts thereof.

Various other objects and advantages of the invention will be in part obvious from an inspection of the accompanying drawings and in part will be more fully set forth in the following particular description of one form of mechanism embodying my invention, and the invention also consists in certain new and novel features of construction and combination of parts hereinafter set forth and claimed.

Referring to the accompanying drawings: Figure 1 is a horizontal sectional view through a tracker-bar provided with a preferred embodiment of my invention; and Fig. 2 is a front elevation of the device shown in Fig. 1.

There is illustrated a portion of a player piano spool box 3 including a tracker bar 4 provided with ducts 5 across the face of which bar is drawn the perforated music roll 6 unrolled from the upper spool 7. This spool is shifted laterally in either direction through the agency of some suitable pneumatically actuated mechanism indicated diagrammatically by the pneumatic 8, due to change of pneumatic pressure in either of the air ports 9 at opposite ends of the tracker bar. These ports are each closed by valves 10 having stems 11 slidably mounted in the tracker bar for movement toward and from each other and transversely of the travel of the sheet. Each valve stem has an outturned finger 12 projecting through small slots 13 in the face of the tracker bar and the fingers are so spaced apart that the sheet fits therebetween when the fingers are in their limited position closest together. A permanently magnetized bar magnet 14 is mounted on the rear face of the tracker bar in line with the valve stems and positioned between the same. The valve stems, the fingers, or at least the portions thereof adjacent the ends of the magnet are of iron so as to be attracted by opposite poles of the magnet and the valves and their stems are preferably of such a length that each valve is firmly seated over its port 9 when the inner end of the stem or finger is positioned relatively close, if not actually touching, the adjacent end of the bar magnet.

In operation, and with the music sheet traveling in its normal path the magnet acts on the fingers at opposite ends thereof to draw the valves into position closing communication through the ports 9. The intensity of the engagement may be controlled by varying the magnetic strength of the magnet but while the magnet should be designed so as to insure an air-tight fit of the valves against the ports, the pull of the magnet should not be so strong as to injure the edge of the music sheet as it presses against the projecting fingers. Should the sheet wander from its normal position one or the other of its edges will bear on the finger in its lateral path of movement and acting against the magnetic pull of the bar 14 force the valve on the shifted side away from its port. This opening of the port to the atmosphere will inaugurate the actuation of the sheet shifting device to replace the sheet in its normal position as is usual with devices of this character.

The release of the pressure of the sheet against the shifted finger will permit the magnet to act thereon and return the valve to its normal port closing position.

By means of a device of this character a positive closing of the air ports is insured and a steady uniform engagement with the shifted sheet is attained which engagement is independent of temperature changes, can be maintained without the necessity of replenishing electric batteries or supplying any source of power.

As the force acting on the valve is at its maximum only when the sheet is shifted slightly, any running wild of the music sheet

will not damage the edge thereof as the farther away from the magnet the finger is forced, the less will be the pull of the magnet thereon.

While I have shown and described, and have pointed out in the annexed claims, certain novel features of my invention, it will be understood that various omissions, substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention.

Having thus described my invention, I claim:

1. In a device of the class described, the combination of a valve controlling finger adapted to be actuated by the lateral wanderings from normal of the edge of a traveling sheet and a magnet having one of its poles positioned adjacent to and acting on said finger to draw the same toward the normal position of the sheet and tending to maintain the valve in set position.

2. In a player piano provided with a tracker bar, the combination of a pair of fingers projecting through the bar and adapted to have the music sheet fitted therebetween, valves for controlling sheet shifting mechanism operatively controlled by the shifting of the sheet against said fingers, a bar magnet fixed to the tracker bar and positioned between and acting on said fingers to draw the same toward the adjacent edges of the music sheet.

3. In a player piano, sheet shifting mechanism operatively controlled by the lateral wanderings of the music sheet, a permanent magnet operatively associated with said mechanism to maintain parts thereof resiliently in engagement with the edges of the music sheet when traveling out of its normal path.

4. In a player piano; a sheet shifting mechanism including a sheet engaging member, means acting on said member tending to move the same in a direction toward the normal path of the music sheet, said means acting on said member with a pressure decreasing in intensity as the member is moved in a direction away from the normal path of the sheet whereby in case the sheet runs wild it will be engaged by a pressure relatively light compared with the pressure thereon while the sheet is wandering but a slight distance from its normal path.

5. In a player piano, the combination of a pneumatically actuated sheet shifting mechanism, and a magnetically actuated control for governing the actuation of said mechanism.

6. In a player piano, the combination of a pneumatically actuated sheet shifting mechanism including a valve and a magnetically actuated control for governing the actuation of said valve.

7. In a self-playing piano, sheet shifting mechanism including a valve opening, a valve for controlling said opening, means operatively connected to said valve and controlled by the wanderings of the music sheet for actuating said valve and for moving the same from its normal position and energic means being immovable and fixed in position and acting on said valve tending to maintain the same in normal position, said energic means constituting a stop for limiting the movement of said first named means.

8. In a self-playing piano, the combination of a pair of armatures spaced apart a distance to accommodate a music sheet therebetween, a single bar magnet disposed between and having its opposite poles operatively acting upon said armatures to draw the same toward the path of the music sheet and mechanism operatively controlled by said armatures.

9. In a device of the class described, the combination with a sheet edge engaging member, means acting on said member to force the same toward the normal path of travel of the sheet, said means exerting a variable tension on said member inversely proportionate to the distance of the member from said normal path whereby when the sheet is running wild the edges thereof will be engaged by a pressure materially less than the pressure when the sheet is wandering but slightly from its normal path.

10. In a player piano, a sheet controlled mechanism including an armature adapted to be operatively actuated by the sheet and a magnet for said armature designed to maintain said armature in normal position.

11. A valve structure including a valve opening, a valve for said opening and a permanent magnet operatively acting on said valve to maintain the same in position closing said opening.

Signed at Newark, in the county of Essex and State of New Jersey, this 26th day of January, 1915.

FRANK G. LYNDE.

Witnesses:
H. R. BAUER,
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