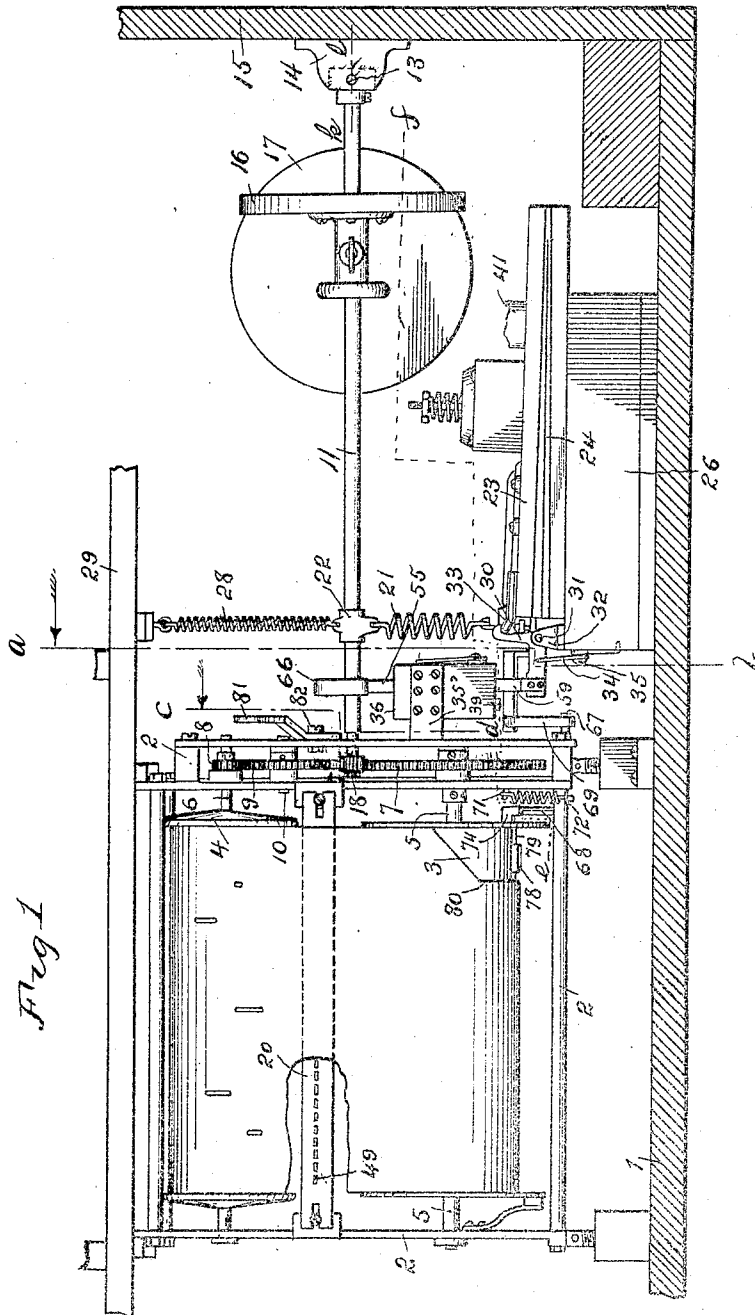


F. W. WOOD.
MUSIC SHEET ROLLER MECHANISM.
APPLICATION FILED APR. 13, 1911.

1,055,690.

Patented Mar. 11, 1913.

6 SHEETS—SHEET 1.



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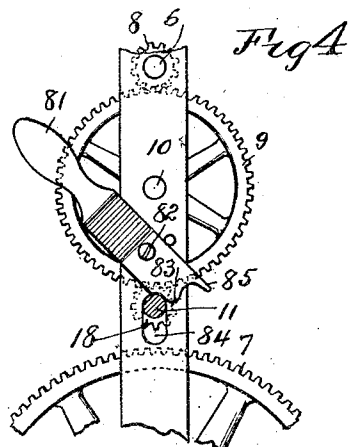
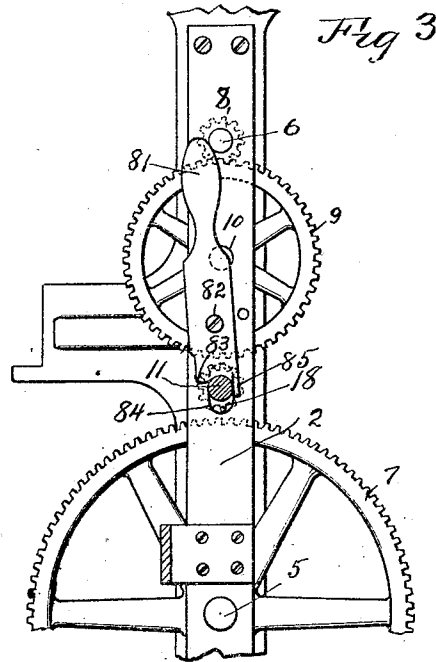
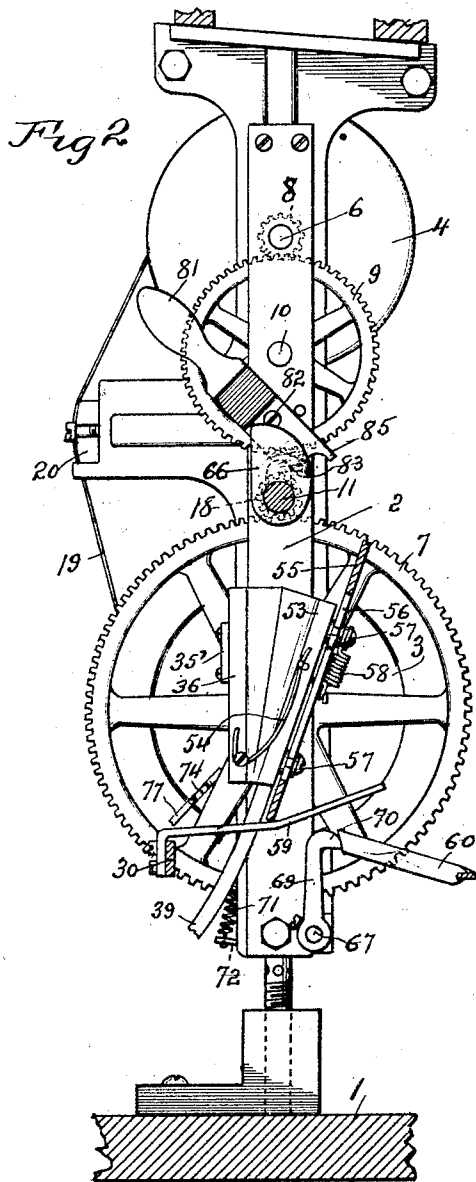
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5 SHEETS—SHEET 2.



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5 SHEETS—SHEET 3.

Fig 5

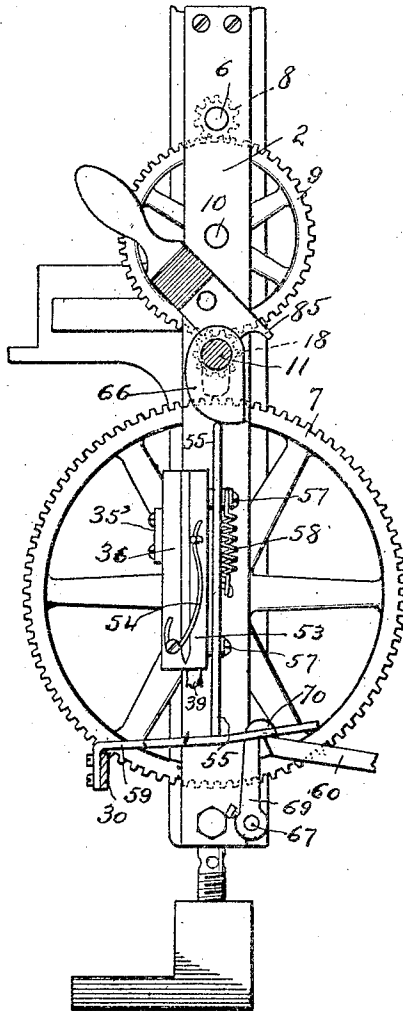


Fig 6

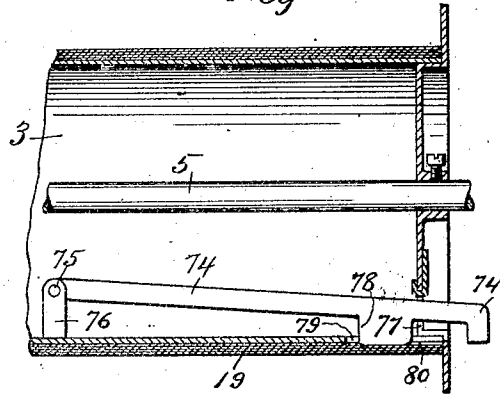
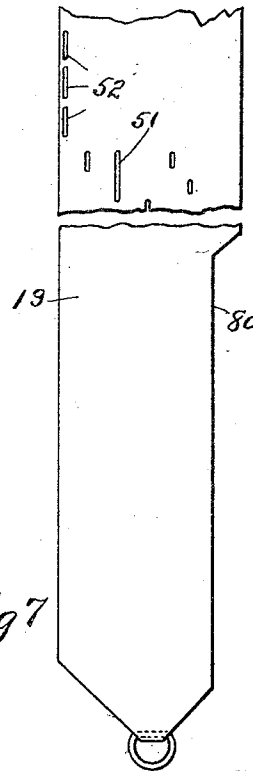


Fig 7



WITNESSES:

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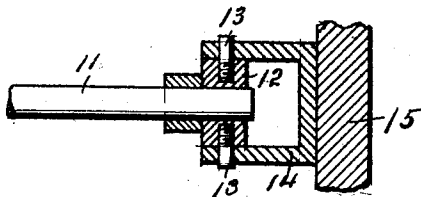
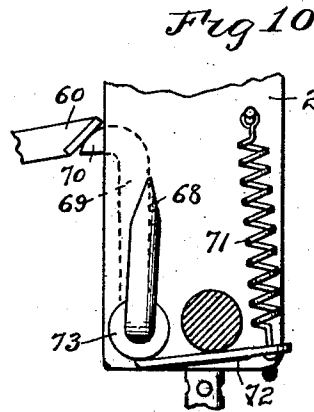
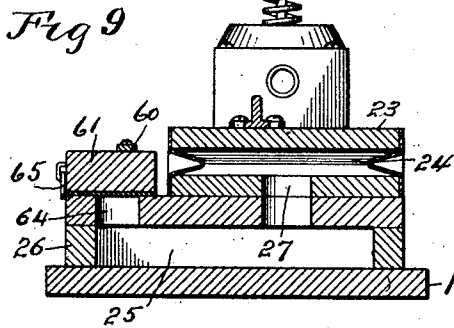
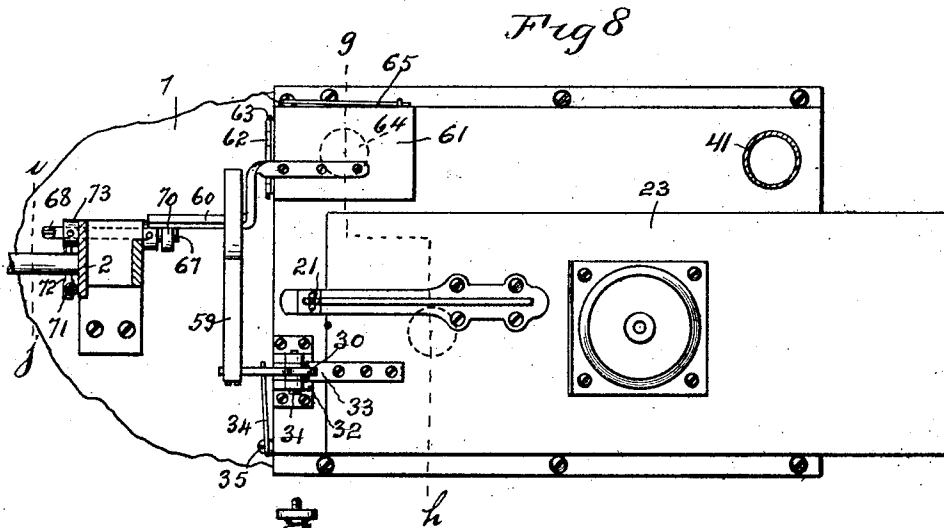
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Patented Mar. 11, 1913.

6 SHEETS—SHEET 4.



WITNESSES:

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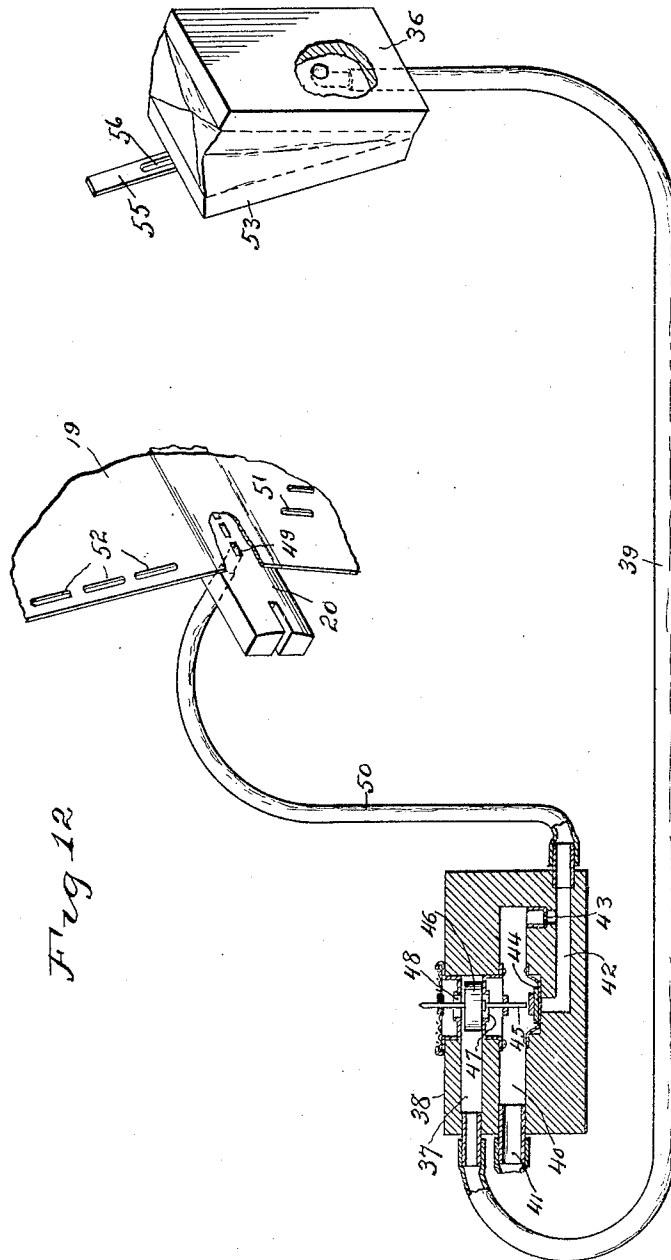
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APPLICATION FILED APR. 13, 1911.

Patented Mar. 11, 1913.

5 SHEETS—SHEET 5.

1,055,690.



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UNITED STATES PATENT OFFICE.

FREDERICK W. WOOD, OF KANSAS CITY, MISSOURI, ASSIGNOR TO THE BERRY-WOOD PIANO PLAYER COMPANY, OF KANSAS CITY, MISSOURI, A CORPORATION OF MISSOURI.

MUSIC-SHEET ROLLER MECHANISM.

1,055,690.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed April 13, 1911. Serial No. 620,857.

To all whom it may concern:

Be it known that I, FREDERICK W. WOOD, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Music-Sheet Roller Mechanisms, of which the following is a specification.

My invention relates to improvements in music sheet roller mechanisms, such as are employed in automatic piano players.

It is particularly adapted for use in connection with pneumatically operated piano players.

One object of my invention is to provide locking means by which the driving mechanism is positively retained in driving relation to the feed roller and prevented from accidental disengagement therefrom during the operation of playing a music sheet.

Another object of my invention is to provide means, controlled by the music sheet and actuated by the driving mechanism, by which the driving mechanism is disengaged from driving connection with the feed roller after the sheet has been played.

A further object of my invention is to provide yielding means, such as a spring, for connecting the driving shaft and the pneumatic, which moves the shaft to the winding or playing position, thereby permitting a certain range of movement of the pneumatic during the playing operation, without danger of the shaft moving from the playing position.

My invention provides also yielding means for shifting the shaft to the playing and rewinding positions, such yielding means eliminating danger of injury to the driving gearing connected with the driving shaft, such as might occur upon shifting the shaft to the different positions, if unyielding means were employed to effect such shifting.

Another object of my invention is to provide a structure in which the rolls of music may be changed without the necessity of stopping the operation of the driving mechanism.

Still another object of my invention is to provide at one end of the feed roller at the

outside of the adjacent end flange a tripping device which controls the playing operation of the feed roller. By locating the tripping device at the outside of the flange, there is no danger of mutilation of or interference with the music sheet by the tripping device.

Other novel features of my invention are hereinafter fully described and claimed.

In the accompanying drawings which illustrate one form of my invention, Figure 1 is a view partly in elevation and partly broken away of my improved roller mechanism. In this view the driving shaft and other parts are shown in the playing position. Fig. 2 is an enlarged vertical section on the line *a-b* of Fig. 1, the driving shaft being in the playing or winding position. Fig. 3 is an enlarged vertical section on the line *c-d* of Fig. 1, the driving shaft being shown held in the neutral position by the gravity actuated locking lever. Fig. 4 is a view similar to Fig. 3, the driving shaft being shown in the rewinding position. Fig. 5 is a view similar to Fig. 2, excepting that the driving shaft is in the rewinding position and the cam on the driving shaft is shown, in Fig. 5, engaged with the slidable plate carried by the pneumatic which controls the rewinding operation. Fig. 6 is an enlarged longitudinal vertical section of the feed roller, the trip lever being shown held by the music sheet in the inner or neutral position. Fig. 7 is a fragmental plan view, reduced, of portions of the two ends of a music sheet, one portion containing the perforations which control the rewinding and the other portion showing the cut out portion in one edge which permits the trip lever to drop into operative position. Fig. 8 is a horizontal section on the broken line *e-f* of Fig. 1. Fig. 9 is a cross section on the broken line *g-h* of Fig. 8. Fig. 10 is an enlarged cross section on the dotted line *i-j* of Fig. 8. Fig. 11 is an enlarged horizontal section on the line *k-l* of Fig. 1. Fig. 12 is a view partly in perspective and partly in vertical section of a portion of the mechanism which controls the rewinding operation.

Similar reference characters designate similar parts.

1 designates a horizontal base which supports a frame 2 of any desired or suitable form.

3 and 4 designate respectively a feed or winding roller and a rewinding roller mounted respectively on horizontal shafts 5 and 6 disposed parallel with each other one above the other, and rotatively mounted in the frame 2.

10 Secured to and rotative with the shaft 5 is a spur gear wheel 7. Secured to and rotative with the shaft 6 is a pinion 8. The pinion 8 meshes with a spur gear wheel 9 secured to a shaft 10 which is rotatively mounted in the frame 2.

11 designates a horizontal rotary driving shaft which has its right end, as viewed in Fig. 1, rotatively mounted in a collar 12 having oppositely disposed trunnions 13 respectively pivoted in horizontal holes provided in the two arms of a U shaped bracket 14 which is secured to an upright plate 15, the lower end of which is secured to the base 1.

25 Any suitable means may be provided for rotating the shaft 11. In the drawing I have shown a friction disk 16 secured to the shaft 11 and having its periphery bearing against a friction driving disk 17 which may be rotated by a suitable motor mechanism, not shown.

On the left end of the shaft 11, as viewed in Fig. 1, is rigidly secured a pinion 18 which is located between the gear wheels 7 and 9. When the shaft 11 is swung on its pivotal support, above described, to the winding or playing position, shown in Fig. 1, the pinion 18 will mesh with the gear wheel 7 and will rotate the feed roller 3 so as to wind thereon a music sheet 19, one end of which may be secured to the periphery of the roller 3 in any desired well known manner. With the driving shaft 11 in the playing position, shown in Fig. 1, the rewinding roller 4, upon which the music sheet 19 is wound prior to being played, may be free to rotate to permit the music sheet 19 being drawn by the feed roller 3 over the tracker bar 20, which is secured to the frame 2 in a horizontal position between the rollers 3 and 4. When the driving shaft is swung upwardly on its pivotal support, the pinion 18 will mesh with the gear wheel 9, thereby causing rotation of the roller 4 in a direction such that the music sheet 19 will be rewound upon said roller. For forcing the driving shaft 11 to the playing position shown in Figs. 1 and 2, the following described mechanism is preferably provided: A coil spring 21 has its upper end secured to a collar 22 in which the shaft 11 is rotative. The lower end of the spring 21 is secured to the vertically movable member 23 of a pneumatic 24, which may be an ordinary bellows. The bellows 24 communicates with a vacuum

chamber 25 of a wind chest 26 supported on the base 1. The air may be exhausted in the usual manner from the vacuum chamber 25. When the air is exhausted from chamber 25, it will also be exhausted from the pneumatic 24 by way of the air passage 27 which connects the pneumatic with chamber 25. Upon the pneumatic 24 collapsing to the position shown in Fig. 1, due to withdrawal of air therefrom, it will, through the spring 21 and collar 22, draw the driving shaft 11 downward to the playing position, shown in Figs. 1 and 2, in which position the driving shaft will remain until the roll of music has been played, and the larger portion of the music sheet 19 has been wound on the roller 3. After the roll of music has been played, it will be necessary to rewind the music sheet on the roller 4, after which the music sheet may be removed in the usual manner and a new music sheet placed upon the roller 4 and connected at one end to the periphery of roller 3, as already described.

To shift the driving shaft 11 from the playing position, shown in Figs. 1 and 2 to the rewinding position, shown in Figs. 4 and 5, the following mechanism is preferably provided: A coil spring 28 has its lower end secured to the collar 22, its upper end being secured to a plate 29 mounted on top of the frame 2. The spring 21 is stronger than the spring 28, so that as long as the pneumatic 24 is collapsed, as shown in Fig. 1, the spring 21 will overcome the spring 28, and the shaft 11 will be held in the playing position. As soon, however, as the pneumatic 24 expands, which occurs after a roll of music has been played, the pull of the spring 21 will cease and then the spring 28 will swing the shaft 11 to the rewinding position shown in Figs. 4 and 5. In order that the pneumatic 24 may not be permitted to expand, even if the vacuum in it and in chamber 25 is destroyed, accidentally or otherwise, until the roll of music has been played, a safety locking mechanism is provided which holds the member 23 of the pneumatic 24 from rising above a predetermined position. This locking mechanism preferably consists of a latch 30 which is supported by a horizontal pivot pin 31 mounted in a bracket 32 supported on the wind chest 26, the latch being adapted to automatically lockingly engage a projecting horizontal plate 33 secured on the upper side of the member 23. The latch 30 is normally held in position for engaging with the plate 33 by a spring 34 supported by a screw 35 secured to the chest 26, as shown in Fig. 1.

For automatically swinging the latch 30 to a position in which the plate 33 will be released after the roll of music has been played, I preferably provide the following

mechanism: Supported by a bracket 35, which is mounted on the frame 2, is a pneumatic 36, which may be of ordinary form, and which, as shown in Fig. 12, communicates with a passage 37 in a wind chest 38, by means of a conductor 39. The wind chest 38 is provided with a vacuum chamber 40, which may communicate with the vacuum chamber 25 by a conductor 41. The vacuum chamber 40 communicates with a passage 42 by a small passage 43. The inner end of the passage 42 is closed by a horizontal diaphragm 44 which separates the chamber 40 from the passage 42, and which is adapted to be raised by air in the passage 42 so as to strike and lift a valve stem 45, which supports a valve 46 located in the passage 37, and which normally closes a passage 47 which is adapted to connect the chamber 40 and the passage 37. The passage 37 has an air inlet 48 which, when the diaphragm 44 is raised, is closed by the valve 46. A conductor 50 connects the passage 42 with an air passage 49 in the tracker bar 20, as shown in Fig. 12. The capacity of the passage 43 should be less than that of the passage 49, so that when passage 42 is uncovered sufficient air pressure will accumulate in the passage 42 to lift the diaphragm 44.

One or more longitudinally aligned perforations 52, following the usual perforations 51, are provided in the music sheet 19, as shown in Figs. 7 and 12. After the sheet 19 has been played, the first of perforations 52 will register with the passage 49 in the tracker bar, thus letting air enter passage 42 through passage 49 and conductor 50. The air in passage 42 will then lift the diaphragm 44, thus moving valve 46 to close the air inlet 48 and to open passage 47 so as to connect chamber 40 and passage 42. The pneumatic 36 will then collapse to the position shown in Fig. 5. The movable member, designated by 53, of the pneumatic 36 is normally held expanded by a spring 54.

On the movable member 53 is vertically slidably mounted a plate 55 having a vertical slot 56 through which extend two screws 57 that serve as guides for the plate 55. To normally hold the plate 55 raised, as shown in Fig. 2, a coil spring 58 has one end secured to the upper screw 57, the other end of the spring being secured to the plate 55 at a point below the upper screw 57. Below the lower end of the plate 55 and located in a position to be depressed by said plate 55 when the plate is in the vertical position shown in Fig. 5, and is in the depressed position shown in said Fig. 5, is a substantially horizontal plate 59 one end of which is secured to the latch 30, the other end being disposed above a horizontal plate 60 which is secured to a valve 61, which is hinged to the wind chest 26 by a hinge 62 having a horizontal pintle 63. The valve 61 is adapted

ed to normally close a vertical air inlet 64 in the chest 26 and communicating with chamber 25. A spring 65 normally holds the valve 61 in the closed position, shown in Figs. 8 and 9.

Secured to the driving shaft 11 is a cam 66, which, when the pneumatic 36 is collapsed, as shown in Fig. 5, will strike the slidable plate 55 and force it downward to the position shown in Fig. 5, thus causing the plate 59 to be depressed and strike the plate 60, thereby swinging the valve 61 to the open position. At the same time the plate 59 will swing the latch 30 to a position releasing the plate 33 and member 23. As soon as the valve 61 is opened, air entering the vacuum chamber 25 and the pneumatic 24 will cause the pneumatic 24 to expand, the pneumatic by this time being free from the latch 30. The strain on the spring 21 will thus be removed and the coil spring 28 will draw the driving shaft 11 upward into the rewinding position shown in Figs. 4 and 5. The roller 4 will then be caused to rotate so as to rewind the music sheet 19, in the manner already described. While the music sheet is being rewound, the valve 61 should be retained in the open position, so that the music sheet will not be played during the rewinding operation, and also to prevent the pneumatic 24 from being collapsed so as to pull down the shaft 11 from the rewinding position.

To hold the valve 61 open while the roll of music is being rewound on roller 4, I preferably provide the following described mechanism:—Referring particularly to Figs. 1, 2, 5, 8 and 10, 67 designates a horizontal rock shaft pivotally mounted in the frame 2 and provided at one end, adjacent the roller 3 with a vertical crank arm 68. Secured rigidly at its lower end to the shaft 67 is an upwardly extending crank arm 69 having a hook 70 at its upper end which is adapted, when the plate 60 is depressed, as shown in Fig. 5 to engage and hold the said plate in the depressed position until the rock shaft 67 is rocked so as to free the plate 60 from the hook 70. The rock shaft 67 is normally held in position for the hook 70 to engage the plate 60 by a vertical spring 71 the upper end of which is secured to the frame 2, and the lower end of which is secured to a horizontal rod 72 which is secured to a collar 73 rigidly secured to the rock shaft 67. When the cam 66 depresses the plate 55, thereby opening the valve 61, and releasing the latch 30 as has been described, the plate 60 will strike the hook 70, and, by forcing the hook and rock shaft carrying it to swing, will pass under and be held by the hook 70 until the roll has been rewound on the roller 4. After the roll has been rewound, and it is desired to replay the music which has just been played, the crank arm 68 of the rock

shaft 67 is moved so as to release the plate 60 from the hook 70. The preferred means for so moving the crank arm 68 I will now describe.

Referring to Figs. 1 and 6, 74 is a trip lever disposed lengthwise in the roller 3 to which the inner end of the lever is pivotally connected by a transverse pin 75 mounted in a radial post 76 secured to the inner periphery of the roller 3. The trip lever 74 extends through a radial slot 77 in the adjacent end of the roller 3 and is adapted to have its outer end strike the crank arm 68 so as to release the hook 70 from the plate 60, when the trip lever 74 is properly positioned and the roller 3 is rotated in a direction opposite the winding direction. In order that the trip lever 74 may be normally held out of striking distance from the crank arm 68, said lever is provided with a lateral projection 78 which is movable radially in a longitudinal slot 79 provided in the roller 3. The length of the projection 78 is such that the music sheet 19 will normally hold the trip lever 74 in a position that the lever will not strike the crank arm 68. The end of the music sheet 19 which is attached to the roller 3, is provided with a longitudinal notch 80 along one edge of the sheet. This notch is so disposed that when unwound, as shown in Fig. 1, the sheet 19 will not support the lever 74, which will drop to the position shown in Fig. 1, in which position, the crank arm 68 will be struck by the lever 74, upon which the hook 70 will be released from the plate 60. The valve 61 will then close and the pneumatic 24 will be collapsed, thus operating the driving mechanism so as to rotate the roller 3 to wind thereon the sheet 19. The sheet 19 will then again be played, and after being played, the first perforation 52 in the sheet 19 registering with the air passage 49 of the tracker bar, will permit the air to enter the passage 42, thereby effecting the collapsing of the pneumatic 36 in the manner I have already described. The valve 61 will then be opened by the mechanism connected with the pneumatic 36, thereby permitting air to enter the chamber 25 and the pneumatic 24. The pneumatic 24 will then expand and will thus permit the spring 28 to draw the driving shaft 11 to the rewinding position, after which the sheet 19 will be again rewound upon the roller 4 as has been described.

To remove or insert a music roll 19 without stopping the motor driven shaft 11, I have provided a lever 81 which is pivoted on a screw 82 secured horizontally to the frame 2. This pivot screw is disposed in the lever 81 and relative to the shaft 11 so that the lever 81 will drop by gravity from the locking position, shown in Fig. 3 to the release position shown in Fig. 2 when the shaft 11 is drawn downward out of engagement with

the lever 81. In operating this part of my invention, the lever 81 is swung from the release position shown in Fig. 2 to the locking position shown in Fig. 3 after a roll has been nearly all rewound upon the roller 4, but before the projection 78 of the trip lever 74 has been uncovered so as to permit the trip lever 74 to drop to the operative position, shown in Fig. 1. The lower end and forward edge of the lever 81 is rounded at 83, so that when the lever 81 is swung to the locking position shown in Fig. 3, the lever 81 will strike and depress the shaft 11 to the neutral position in which, as shown in Fig. 3, the pinion 18 will be disengaged from the gears 7 and 9. Both rollers 3 and 4 will now be free to rotate. The music roll may now be detached from both rollers and a new music roll substituted for the roll removed, the starting end of the new roll being secured to the roller 3, care being taken to keep the lever 74 raised, when the roller 3 is retractionally rotated, in detaching and affixing to said roller the end of the music sheet. After the new roll has been mounted in playing position on the rollers 3 and 4, the rewinding roller may be turned by hand so as to withdraw the sheet from the roller 3, thereby retractionally rotating the roller 3 until the lever projection 78 drops through the slot 79 and notch 80. When this occurs the lever 74 will trip the crank arm 68, thus causing the rock shaft 67 to rock and release the hook 70 from the plate 60, after which the spring 65 will close the valve 61. The pneumatic 24 will then collapse thus drawing the shaft 11 to the playing position, and the roller 3 will be rotated to wind thereon the music sheet 19, and lever 81 will swing by gravity to the release position. After the new roll has been mounted, as above described, on the rollers 3 and 4, the machine may be again started in operation as follows. The lever 81 may be swung from the locking position to the release position shown in Fig. 2. The shaft 11 being thus released will be drawn upward by the spring 28, the valve 61 being open. The roller 4 will then be rotated so as to wind thereon the sheet 19 until the projection 78 drops through the slot 79 and notch 80, after which, as above described, the lever 74 will trip the crank arm 68 so as to cause the valve 61 to be closed, the pneumatic 24 operated to force the shaft 11 to the playing position, and the roller 3 rotated to wind thereon the sheet 19.

As shown in the drawings, the frame 2 is provided with a vertical slot 84 through which the driving shaft 11 extends, the slot serving as a guide for preventing lateral movement of the shaft 11. The rear edge of the lower end of the lever 81 may be provided with a downwardly extending portion 85 adapted to strike the shaft 11 to limit the

rearward swinging of the upper end of the lever 81.

From the foregoing description it will be understood that a music roll may be re-
5 played as often as desired without the mechanism requiring any attention from the operator, or a new roll may be substituted after one has been played.

The automatic locking mechanism holds
10 the pneumatic 24 collapsed during the playing of a roll, thereby reliably holding the driving mechanism in playing position until a roll has been played. As the valve 61, which controls admission of air to the
15 vacuum system, is forced to the open position by the directly applied power of the driving mechanism, the starting into operation of the rewinding mechanism, after a roll has been played, is assured.

20 I am aware that many modifications of my invention, within the scope of the appended claims, may be made, and I, therefore, do not limit my invention to the structure shown and described.

25 Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In music sheet roller mechanisms, a roller adapted to wind thereon a music
30 sheet, a rotary driving shaft, means for rotating the roller when the shaft is moved to a predetermined position, a pneumatic, and yielding means actuated by the pneumatic for moving the shaft to said position.

35 2. In music sheet roller mechanisms, a roller adapted to wind thereon a music sheet, a rotary driving shaft, means for rotating the roller when the shaft is moved to a predetermined position, a pneumatic, and
40 a spring by which the pneumatic moves the shaft to said predetermined position.

45 3. In music sheet roller mechanisms, a roller adapted to wind thereon a music sheet, a pivoted rotary driving shaft, means for rotating the roller when the shaft is swung to a predetermined position, a pneumatic, and yielding means by which the
50 pneumatic may swing the shaft to said predetermined position.

55 4. In music sheet roller mechanisms, a roller adapted to wind thereon a music sheet, a pivoted rotary driving shaft, means for rotating the roller when the shaft is swung to a predetermined position, a pneumatic, and a spring by which the pneumatic
60 may swing the shaft to said predetermined position.

65 5. In music sheet roller mechanisms, a roller adapted to wind thereon a music sheet, a rotary driving shaft, means for rotating the roller when the shaft is moved to a predetermined position, yielding means for moving said shaft from said position, a pneumatic, and yielding means by which
the shaft may be moved by the pneumatic to

said position against the pressure of the first named yielding means.

6. In music sheet roller mechanisms, a roller adapted to wind thereon a music
70 sheet, a rotary driving shaft, means for rotating the roller when the shaft is moved to a predetermined position, a spring for moving the shaft from said position, a pneumatic, and yielding means by which the
75 shaft may be moved by the pneumatic to said position against the pressure of said spring.

7. In music sheet roller mechanisms, a roller adapted to wind thereon a music
80 sheet, a rotary driving shaft, means for rotating the roller when the shaft is moved to a predetermined position, a spring for moving the shaft from said position, a pneumatic, and a spring by which the pneumatic
85 may move the shaft to said position, the second named being of greater strength than the first named spring.

8. In music sheet roller mechanisms, a roller adapted to wind thereon a music
90 sheet, a pivoted rotary driving shaft, means for rotating the roller when the driving shaft is swung to a predetermined position, a spring for swinging the shaft from said position, a pneumatic, and a spring which
95 is stronger than the first named spring and by which the pneumatic may swing the shaft to said position.

9. In a music sheet roller mechanism, a roller, roller driving mechanism, a pneumatic, means by which when the pneumatic
100 is collapsed, the driving means will be operated to rotate the roller, locking means for holding the pneumatic collapsed, and means actuated by the driving means for releasing the pneumatic from said locking means.
105

10. In a music sheet roller mechanism, a roller, roller driving mechanism, a pneumatic, means by which when the pneumatic
is operated the driving means will be operated to rotate the roller, locking means
110 for holding the pneumatic in position for operating the driving means, means actuated by the driving means for releasing the pneumatic from the locking means, and means controlled by the music sheet for controlling
115 said releasing means.

11. In a music sheet roller mechanism, a roller, roller driving mechanism, a pneumatic, means by which when the pneumatic
120 is operated the driving means will be operated to rotate the roller, locking means for holding the pneumatic in position for operating the driving means to rotate the roller, means actuated by the driving means
125 for releasing the pneumatic from the locking means, a tracker bar, and means controlled by the tracker bar for controlling the operation of said releasing means.

12. In a music sheet roller mechanism, a rotary driving shaft, a pneumatic having a
130

movable part, means by which the shaft is moved into an operative position when the movable part is moved to a predetermined position, locking means for holding said part in said position, and means actuated by the shaft for releasing the pneumatic from said locking means.

13. In a music sheet roller mechanism, a rotary driving shaft, a cam on said shaft, a pneumatic, means actuated by the pneumatic for moving the shaft into an operative position, locking means for holding the pneumatic in a position in which it will hold the shaft in said operative position, and means actuated by the cam for releasing the pneumatic from the locking means.

14. In a music sheet roller mechanism, a rotary driving shaft, a cam on said shaft, a pneumatic having a movable part, means by which when said movable part is moved to a predetermined position the shaft will be moved into an operative position, a latch for holding said part in said predetermined position, and means actuated by the cam for releasing the latch from the said part.

15. In a music sheet roller mechanism, a rotary driving shaft, a cam on said shaft, a pneumatic having a movable part, means by which when the movable part is moved to a predetermined position the shaft will be moved to an operative position, a locking means for holding said part in said predetermined position, means actuated by the cam for releasing the locking means from said part, and means controlled by a music sheet for controlling said releasing means.

16. In a music sheet roller mechanism, a rotary driving shaft, a cam on said shaft, a pneumatic having a movable part, means by which when the movable part is moved to a predetermined position the shaft will be moved to an operative position, a locking means for holding said part in said predetermined position, means actuated by the cam for releasing the locking means from said part, a tracker bar, and means controlled by the tracker bar for controlling said releasing means.

17. In a music sheet roller mechanism, a rotary driving shaft movable alternately to a winding position and to a rewinding position, a wind chest having a vacuum chamber, a pneumatic communicating with the said chamber, means by which when the pneumatic is collapsed the driving shaft will be moved to the winding position, means for moving the shaft to the rewinding position when the pneumatic is not collapsed, and means actuated by the shaft for opening the vacuum chamber to the atmosphere so as to permit the expanding of the pneumatic.

18. In a music sheet roller mechanism, a rotary driving shaft movable alternately to winding and to rewinding positions, a wind

chest having a vacuum chamber and having an air inlet communicating with said chamber, a valve for closing said inlet, a pneumatic communicating with said chamber, means for moving the driving shaft to the winding position when the pneumatic is collapsed, means for moving the shaft to the rewinding position when the pneumatic is expanded, and means actuated by the shaft for moving the valve to the open position.

19. In a music sheet roller mechanism, a rotary driving shaft movable alternately to winding and rewinding positions, a wind chest having a vacuum chamber and an air inlet communicating with said chamber, a pneumatic communicating with said chamber, means for moving the shaft to the winding position when the pneumatic is collapsed, means for moving the shaft to the rewinding position when the pneumatic is expanded, a valve for closing said inlet, means actuated by the shaft for opening said valve, and means controllable by a music sheet for holding the valve open.

20. In a music sheet roller mechanism, a rotary driving shaft movable alternately to winding and rewinding positions, a wind chest having a vacuum chamber and an air inlet communicating with said chamber, a valve for closing said inlet, a pneumatic communicating with said chamber, means for moving the shaft to the winding position when the pneumatic is collapsed, means for moving the shaft to the rewinding position when the pneumatic is expanded, means actuated by the shaft for opening said valve, means controlled by a music sheet for holding the valve open, and means controllable by the music sheet for controlling the valve opening means.

21. In a music sheet roller mechanism, a rotary driving shaft movable to and from a winding position, a wind chest having a vacuum chamber and an inlet communicating with said chamber and communicating with the atmosphere, a valve for closing said inlet, a pneumatic communicating with said chamber, means for moving the shaft to the winding position when the pneumatic is collapsed, means for moving the shaft from the winding position when the pneumatic is expanded, and means actuated by the shaft for moving the valve to the open position.

22. In a music sheet roller mechanism, a rotary driving shaft movable to and from a winding position, a wind chest having a vacuum chamber and an air inlet communicating with the chamber, a valve for closing said inlet, a pneumatic communicating with said chamber, means for moving the shaft to the winding position when the pneumatic is collapsed, means for moving the shaft from the winding position when the pneumatic is expanded, locking means

for holding the pneumatic collapsed, and means actuated by the shaft for opening the valve and releasing the locking means from the pneumatic.

23. In a music sheet roller mechanism, a rotary driving shaft movable to and from a winding position, a wind chest having a vacuum chamber, and an air inlet communicating with said chamber, a valve for closing said inlet, a pneumatic communicating with said chamber, means for moving the shaft to the winding position when the pneumatic is collapsed, means for moving the shaft from the winding position when the pneumatic is expanded, locking means for holding the valve open, locking means for holding the pneumatic collapsed, music sheet controlled means for releasing the valve locking means from the valve, and music sheet controlled means for releasing the pneumatic locking means from the pneumatic.

24. In a music sheet roller mechanism, a winding roller, a wind chest having a vacuum chamber and an air inlet communicating with said chamber, a valve for closing said inlet, a pneumatic communicating with said chamber, means by which when the pneumatic is collapsed the winding roller will be rotated, means actuated by said roller rotating means for opening the valve, and music sheet controlled means for controlling the valve opening means.

25. In a music sheet roller mechanism, a winding roller, a wind chest having a vacuum chamber and an air inlet communicating with the chamber, a valve for closing said inlet, a pneumatic communicating with said chamber, means by which when the pneumatic is collapsed the winding roller will be rotated, means actuated by the roller rotating means for opening the valve, music sheet controlled means for locking the valve open, and music sheet controlled means for controlling the valve opening means.

26. In a music sheet roller mechanism, a rotary driving shaft movable alternately to winding and rewinding positions, and releasable locking means for holding the shaft from moving from a neutral position to the rewinding position, but which permits the shaft to move from the neutral to the winding position.

27. In a music sheet roller mechanism, a rotary driving shaft movable alternately to winding and rewinding positions, and releasable locking means for holding the shaft from moving from a neutral position to the rewinding position, but which permits the shaft to move to the winding position, the locking means being automatically releasable when the shaft is moved to the winding position.

28. In a music sheet roller mechanism, a

rotary driving shaft alternately movable to winding and rewinding positions, and a lever which in a predetermined position holds the shaft from moving from a neutral to the rewinding position, but which when in said position permits the shaft to move to the winding position.

29. In a music sheet roller mechanism, a rotary driving shaft alternately movable to winding and rewinding positions, and a lever which in the locking position holds the shaft from moving from a neutral to the rewinding position but permits it to move to the winding position, the pivotal point of the lever being located so that the lever will swing automatically from the locking position when the shaft is moved to the winding position.

30. In a music sheet roller mechanism, a rotary driving shaft movable alternately to winding and rewinding positions, pneumatically controlled mechanism for moving the shaft to said two positions, and releasable means for holding the shaft from moving to the rewinding position but permits its movement to the winding position.

31. In a music sheet roller mechanism, a rotary driving shaft alternately movable to winding and rewinding positions, a spring for moving the shaft to the rewinding position, a spring which is stronger than the first named spring for moving the shaft to the winding position against the tension of the first named spring, and a pneumatic for operating the second named spring to move the shaft to the winding position.

32. In a music sheet roller mechanism, a rotary driving shaft movable to winding and rewinding positions, oppositely operating springs for respectively moving the shaft to said two positions, and pneumatically controlled means for operating one of the springs to move the shaft against the tension of the other spring, one of the springs being stronger than the other.

33. In a music sheet roller mechanism, a rotary driving shaft, a pneumatic, a spring actuated by the pneumatic for moving the shaft to a winding position, a spring weaker than the first named spring for moving the shaft to a rewinding position, and releasable means for holding the shaft from moving from a neutral to the rewinding position, but which permits the shaft to move to the winding position.

34. In a music sheet roller mechanism, a wind chest having a vacuum chamber and an air inlet communicating with said chamber, a valve for closing said inlet, locking means for holding the valve open, a roller adapted when rotated in one direction to wind thereon a music sheet, and means actuated by the roller for releasing the locking means from the valve when the roller is rotated in the opposite direction and the releasing means

is not held in an inoperative position by the music sheet.

35. In a music sheet roller mechanism, a wind chest having a vacuum chamber and an air inlet communicating with said chamber, a valve for closing said inlet, locking means for holding the valve open, a roller having an end flange, and a trip carried by the roller and adapted to engage the locking means and actuate it to release the valve upon retractive rotation of the roller, the engagement of the trip with the locking means taking place at the outer side of the said flange.

36. In a music sheet roller mechanism, a rewinding roller, driving mechanism for rotating said roller, a pneumatic, means controlled by the pneumatic for placing the driving mechanism into driving relation to the roller, a tracker bar having an air passage adapted to be controlled by a music sheet, and means controlled by air passing through said passage for controlling the operation of said pneumatic.

37. In a music sheet roller mechanism, a roller having a peripheral opening, a wind chest having a vacuum chamber and an air inlet communicating with the chamber, a valve for closing said inlet, locking means for holding the valve open, and a trip de-

vice carried by the roller for releasing the locking means, the trip having a portion extending through said opening and by which a music sheet when wound on the roller may hold the trip out of position for engagement with the locking means.

38. In a music sheet roller mechanism, a roller having a peripheral opening, a wind chest having a vacuum chamber and an air inlet communicating with the chamber, a valve for closing said inlet, locking means for holding the valve open, a trip carried by the roller for releasing the locking means, the trip having a portion extending through said opening, and a music sheet adapted to be wound on the roller and to engage said extending portion of the trip for holding the trip disengaged from the said locking means, the sheet having a notch adapted to register with said projecting portion of the trip to permit movement of the trip to a position in which it may engage the locking means.

In testimony whereof I have signed my name to this specification in presence of two subscribing witnesses.

FREDERICK W. WOOD.

Witnesses:

E. B. HOUSE,

WARREN D. HOUSE.