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MUSIC PLAYER WINDING AND ELECTRIC SHIFTER.

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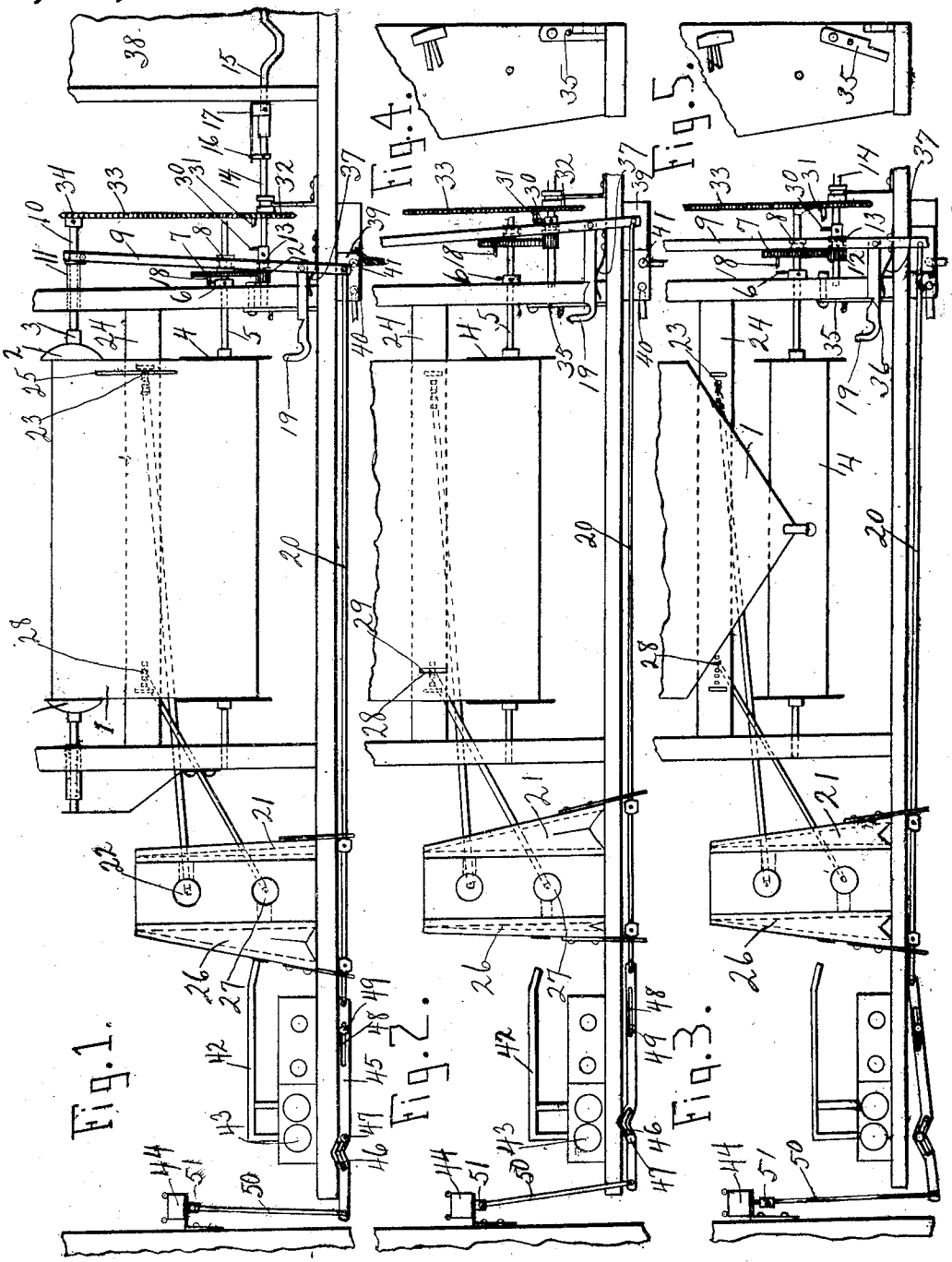

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

WITNESSES.

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MUSIC-PLAYER WINDING AND ELECTRIC SHIFTER.

1,263,878. Specification of Letters Patent. Patented Apr. 23, 1918.

Application filed July 16, 1917. Serial No. 180,870.

To all whom it may concern:

Be it known that I, ROBERT A. GALLY, a citizen of the United States, and residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Music-Player Windings and Electric Shifters, of which the following is a specification.

In the prior art of automatic shifting and control of the winding and rewinding and repeating of an automatic music sheet the patent of M. Gally, #22,030, November 25, 1879, shows the earliest example, being shown at the right of his Figure 1, and described on page 3 of his specification, while a later important development is that of Arno, #596,768, January 4, 1898, which includes means for stopping the electric driving power of his instrument. In the present application are shown various improvements whereby the music sheet may be automatically controlled from its own operation to reverse itself from forward playing operation to its rewind operation, and from rewind motion to repeat its forward playing, also means to interrupt such repeating when desired and cause it to stop the electric motor at said interruption of its travel; and to stop its motion and the operation of the electric motor whenever a music roll without a repeat control perforation reaches the end of its rewinding travel and uncovers the tracker bar.

In the accompanying drawings, Fig. 1 is a front view of a music player tracker, rolls and winding mechanism, with the shifter for the roll travel and electric switch set for starting the forward motion of the sheet for playing music; the repeat perforation being in active coincidence with the repeat aperture of the tracker bar; Fig. 2 is of the same parts with the music sheet at the finish of its forward playing and its rewind perforation coincident with the rewind controlling aperture of the tracker bar; Fig. 3 is of the same parts with the music sheet fully rewound and off the tracker, thus opening both the rewind and repeat apertures of the tracker and bringing the shifter means to a median position with the electric motor cut out of operation. Fig. 4 is a side view of the inside of the right hand side of the roll box of Figs. 1, 2 and 3, showing the interrupter set to interrupt the repeating, and Fig. 5 is the same view with the interrupter set free for repeating.

The parts shown in the drawings herein are understood to be adapted for use with and in control of any suitable self-playing musical apparatus, not necessary to be shown and described herein, and the electric switch here shown is understood to be of any suitable detail, and to be connected to an electric circuit in which are a current source, and a motor, the motor being utilized for operating an air pumper, or supplying power in any suitable manner for operating the playing, winding and rewinding and shifting devices. In the shifting devices as shown, it is understood that air power is supplied by any suitable air current inducing means, and that a variation of such air service is effected by pneumatic means not shown, but understood to be of any suitable type, and to be controlled by some pneumatic means equivalent to that shown in the drawing herein. Except for the particular features claimed with the electric switch as an element, it is to be understood that the operating power may be produced by any other power than electric motor, as by foot, and that the tracker and connections therefrom may be electric or mechanical, etc., instead of pneumatic, and various other equivalents or substitutions employed without departing from the spirit of the invention herein set forth.

A music sheet 1 has the usual roll 2 therewith adapted to be engaged by and revolved with a clutch spindle 3. A take-up spool 4 has the usual means for temporary attachment of the forward end of the music sheet 1, and this spool 4 has its shaft 5 extended therefrom and a clutch 6 affixed thereto. A gear wheel 7 is loosely mounted on the spool shaft 5 and this gear wheel 7 has attached thereto a grooved collar 8, the groove of which is engaged by a pin or lug on the shift lever 9, which shift lever 9 is suitably pivoted at its upper end on the fixed bearing hub 11 or other fixed part of the apparatus.

A pinion 12 and a suitable grooved collar 13 are both fixed to a revoluble drive shaft 14, the groove of the collar 13 being engaged by a pin or lug of the shift lever 9, the right end of shaft 14 extending into a constant

revoluble engagement with the motor shaft 15 of any suitable motor, such as the usual wind or clock motor of player devices. The engagement of drive shaft 14 and motor shaft 15 is by means of their respective clutches 16 and 17, which, while insuring the revolution of drive shaft 14 whenever the motor shaft 15 is revolved, allows the lengthwise movement of drive shaft 14 by action of the shift lever 9, thereby enabling the engagement of the clutch pin 18 on the gear wheel 7 with the clutch 6 of the spool shaft 5 when the shift lever 9 is moved to the extreme left by the handle 19, or as in Fig. 1 by the rod 20 when said rod is automatically shifted to the left by motor pneumatic 21 when said pneumatic is exhausted from valve 22 when said valve is actuated from the repeat aperture 23 of the tracker 24 when said aperture 23 is opened by the repeat perforation 25 of the music sheet 1, the engagement of said two clutches 18 and 6 then enabling the revolution of the shaft 5 and its spool 4 from the drive shaft 14 through pinion 12 meshed with the gear 7.

When the handle 19 is shoved to the right by the person using the apparatus, or, as in Fig. 2, the rod 20 is moved to the right by motor pneumatic 26 when said pneumatic is exhausted from valve 27 when said valve is actuated from the reroll aperture 28 of the tracker 24 when said aperture 28 is opened by the reroll perforation 29 of the music sheet 1, the shift lever 9 is moved to the right and the shaft 14 and clutch 30 fixed with said shaft 14 then engaging the clutch 31 of the sprocket wheel 32, thereby causing said sprocket wheel 31 to revolve and through chain 33 revolve the small sprocket wheel 34 which is fixed on clutch spindle 10, thus causing the said clutch spindle 10 and clutch 3 to revolve and turn the roll 2 and rewind the music sheet 1 on said roll 2 ready for repeating or for removal from the apparatus.

When the reroll position is in effect, as just described, and as shown in Fig. 2, clutches 18 and 6 are free of engagement and the gear wheel 7 can then revolve freely on spool shaft 5 as the pinion 12 revolves it, but allowing the shaft 5 and its spool 4 to revolve in the opposite direction as the music sheet 1 is drawn from spool 4 by the rewinding of said sheet 1 on its roll 2, as said roll 2 is turned by clutch 3 and spindle 10.

It is desirable to place the repeat aperture 23 nearer to the position of one edge of the music sheet 1 than the position of the reroll aperture 28 to the other edge of the music sheet 1, or both the said apertures in similar relation to one edge, so that when a music roll and sheet are placed in the apparatus and the V-shaped forward end of the sheet is drawn down over the tracker 24, the reroll aperture 28 will be closed before or as soon as the closing of the repeat aperture 23, to avoid an improper leading action of the reroll aperture which would prevent the insertion of a roll were the distances of these two apertures reversed as to their relative distances from the edges of the music sheet. The two apertures might be placed at equal distances from the two edges of the music sheet, but this would cause the risk of trouble if the sheet were diverged to the slightest degree from its middle position as it was drawn over the tracker.

When it is desired to prevent the repetition of a music sheet which has a repeat perforation as 25, the interrupter or catch 35 is set in its forward position as shown in Fig. 4, and thus the notch 36 of the handle 19 is caught by said interrupter or catch 35 by the leftward motion of shifter 9 and clutch 30 is clear from clutch 31, and clutch 18 is clear from clutch 6, whereby the revolution of drive shaft 14 causes no revolution of either spool shaft 5 and spool 4, or spindle 10, clutch 3 and roll 4, and the music roll 4 and sheet 1 come to a standstill and may be removed from the apparatus. The handle 19 is pivoted to the shift lever 9 and a spring 37 presses the handle 19 upward to cause the engagement of its notch 36 with the interrupter 35 when said interrupter 35 is set in position to engage said notch 36.

When it is desired to allow the repeating of a music sheet by means of a repeat perforation as 25, the interrupter 35 is thrown to the rear as shown in Fig. 5, so that it is clear of the handle 19, whereby the handle 19 is free to move all the way to the left to accomplish the shift of parts necessary to secure the repetition of the forward travel of the sheet 1 for another playing of the music thereof.

When a music sheet as 1 has no repeat perforation as 25, and the interrupter 35 is thrown off its engaging position for notch 36 of handle 19, or if there be no interrupter means provided, the return travel of the music sheet 1 will continue until it has uncovered repeat aperture 23 of the tracker 24, thus causing the shifting means to start to the left, but the reroll aparture 28 will also be uncovered by the sheet 1, and the action of the motor pneumatic 26 toward the right will thereby check the leftward repeat shift motion, the motors 26 and 21 coming to rest at a middle balanced position, stopping the rod 20, and shift lever 9 at the middle position when the clutches 18 and 6, and 30 and 31 are disengaged, and the revolution of both roll 2 and spool 4 stopped and the music sheet brought to rest. If it is then desired to repeat the playing of the same music sheet, it is only necessary to press down the handle 19 to release its notch

36 from the interrupter 35, and at the same time move the handle 19 to the left to the position for playing. Or another music sheet can be inserted while the handle 19 is left at middle position with its notch 36 engaging interrupter 35, the clutch 3 and its spindle 10, as well as the spool 4 being free for revolution to enable the easy removal and insertion of music roll 2 and music sheet 1.

The notch 36 and interrupter or catch 35 is also convenient even when there is no automatic repeating means, or such means is switched out of use, or there is no air service in action, as it enables the easy setting of the handle 19 and shift lever 9 to the middle position when the clutches 18, 6, 30, 31 are disengaged and the clutch 3, spindle 10, and spool 4 free for easy inserting or removal of a music sheet 1 and roll 4.

The cut out of air supply to the music playing action and the accompanying throwing in the full air supply for the customary wind motor as 38, is preferably controlled by a slide valve 39, having one port 40 leading to a pneumatic cut out valve controlling the air supply to the playing action chests, and another port 41 leading to a pneumatic full air supply for the full power of the air motor 38 required for rewinding the music roll 2. It is preferable that the port 40 be positioned close to the left end of the slide valve 39 so that the air is cut off from the player action well ahead of any chance of the rewinding movement of the music sheet, and it is also desirable that the port 41 be positioned well to the right of port 40 so that the full air service to the wind motor 38 will not be brought on until the forward movement of the paper is ended and the rewinding clutches are well engaged, thus avoiding over heavy friction of these clutches as the shifting movement is being made to the rewind condition. This position of the port 41 to the right also insures its closing soon after the start of the shift from rewinding to winding, so that friction against shifting of the rewind clutches is minimized.

Any well known mechanical connections can be used instead of valve 39 and ports 40 and 41 for controlling the air cut-out to the player action and the full air supply to the wind motor, in which case the time of their action relative to the movement of shift lever 9 and the several clutches should be set to similar periods as above described for the ports 40 and 41.

With either ports 40 and 41, or the mechanical control of the air cut-out and full air supply, the periods of operation of said controls is such that at the position of shifter 9 and handle 19 for winding the sheet 1 and playing of the music, as in Fig. 1, the valve 39 has the ports 40 and 41 closed and thus has the air supply cut-out held out of operation and the full air supply open to the player action by port 40 being closed or by equivalent mechanical means, and the full air supply closed by the closed port 41 or equivalent mechanical means.

With such controls, the rewind position of the shifter 9 and handle 19 and valve 39 as in Fig. 2, will cause the air supply cut-out to the player action to be closed and the full air supply to the wind motor to be open.

With these controls, and the shifter 9 and handle 19 at the middle position and the valve 39 as in Fig. 3, with the clutches 18 and 6, 30 and 31 disengaged and the music sheet 1 at rest, the air supply cut-out is closed to the player and the full air supply to the wind motor 38 is also closed, thereby securing the stopping of movement of the music sheet 1, etc., and the absolute prevention of any notes being sounded by rewinding of the front end of the music sheet beyond the tracker 24 as in Fig. 3 and the consequent open condition of its apertures, as also the similar prevention of improper sounding of notes when a music sheet and its roll are removed for the insertion of another.

To insure a very certain and quick automatic shifting to the rewinding by control from reroll perforation as 29 uncovering the reroll aperture 28, it is desirable to have ducts 42 from high air tension control pneumatics as 43 adapted to be opened by the initial movement of the motor pneumatic 26 which makes the shifting movement for rewinding, thereby insuring a high tension quick and powerful operation of said motor pneumatic 26 during practically the entire time of its working movement. After the completion of the work of said pneumatic 26 it returns to open position and thereby closes ducts 42 and restores the air control system to freedom of control for expression, when the apparatus is again shifted to the playing condition of Fig. 1.

To save waste of electric current, and avoid any slight sound of the electric motor and air pumper operation during the intervals between the rewinding of one music sheet on its roll and the insertion of the next, and also to avoid the annoyance usually caused by the necessity of throwing in both an electric switch and the sheet winding shifter after changing music sheet rolls, a novel electric current cut-out means is provided which is controlled by the shifting of the winding and rewinding shift means so that at both the playing position of the shift in Fig. 1 and the rewinding position in Fig. 2, an electric switch 44 is put in closed circuit to cause the running of the electric motor for driving the air supply means of the player, but that at the middle position of said shift means with the

music sheet 1 at rest and the wind motor 38 cut off from air supply, as in Fig. 3, the electric switch is put in open circuit and the said electric motor and the air inducing means are stopped.

Although this result could be had with a special switch, that is, a switch made to close the circuit at each end of its motion, and open the circuit at the middle of its motion, making two jumps each way, no such switch is on the market, so a novel means is here shown for this special three position action with an ordinary snap switch as 44, the broader claims of the application as to these electric cut-out means being worded to cover any manner of a three position action of an electric cut-out for the purposes herein set forth.

With the ordinary push and pull switch 44 shown herein, the three position control is attained by a cam slide 45 connected at its right end to the shifter rod 20 which has a V-shaped cam way or slot 46 working on a fixed bearing 47, and this slide 45 also has a straight slot 48 working on a fixed bearing 49, these two bearings 47 and 49 being in an approximate line with the main dimension of shifter rod 20, and the shifting motion of both rod 20 and cam slide 46 being in substantially that same general line as the shifter rod 20 and slide 46. A connecting rod or similar member 50 is attached to the left end of the cam slide 45 and to the moving member 51 of the switch 44.

Whenever the shifting means are moved to the left for the forward winding and playing as in Fig. 1, the rod 20 pushes the cam slide 45 to the left so that the right hand and low part of its cam way 46 is engaging the bearing 47, thus throwing the left end of the cam slide 45 upward and thus by means of rod 50 pushing up the moving member 51 of switch 44 and closing the electric circuit for the operation of the electric motor which furnishes the power for playing the apparatus.

When the shifting means are thrown to the right for rewinding of the music sheet 1 as in Fig. 2, the rod 20 pulls the cam slide 45 to the right so that the left hand and low part of its cam way 46 is engaging the bearing 47, thus throwing the left end of the cam slide 45 upward and thus by means of rod 50 pushing up the moving member 51 of switch 44 and closing the electric circuit for the operation of the electric motor which furnishes the power, which power is then used for the rewinding of the music sheet 1.

When the shifting means are brought to the middle position to cause the music sheet 1, roll 2, clutch 3, etc., to be at rest, and enable the ready removal and change of music sheets, as in Fig. 3, the rod 20 holds the cam slide 45 at its middle position of movement, with the middle and high part of its cam way 46 engaging the bearing 47 thus throwing the left end of the cam slide 45 downward and thus by means of rod 50 pulling down the moving member 51 of the switch 44 and opening the electric circuit against operation of the electric motor, thus bringing every element of the apparatus to a condition of rest and quietness, and preventing any waste of current, yet enabling the restarting of playing operation by use of but the one handle 19, the movement of same to the left instantly restoring the electric current for playing.

The bearing 49 acts as a second guide for cam slide 45, and is a pivot on which said cam slide 45 swings when its left end rises and falls.

The shifting movement from left to right, or right to left, passes the middle position of broken circuit so quickly, that there is practically no stoppage of the electric motor, its momentum carrying it over the small moment of current breakage.

The various novel details of the constant mesh gears and simplified drive, and clutch changing of the winding and rewinding parts herein set forth, being useful independently of their present shown use with the special automatic shifters, electric cut-outs, and other features claimed herein, such gearing, drive and clutch means, and also the general use of the three position control of a single motion electric switch and the particular cam form shown therein are claimed in an appropriate separate application #190,674, filed Sept. 10, 1917, also, various modifications may be made in the structure of the means for securing a three position control of a single switch, or a special switch may be employed having two closed positions and an intermediate open position of its action, and yet be subject to the claims hereof; but, what I claim as my invention, is:—

1. A music sheet winding and rewinding apparatus, mechanical shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, pneumatic means adapted to actuate the said shifting means, as aforesaid, and a tracker and apertures therein, and actuating connections from said apertures to said pneumatic means.

2. A music sheet winding and rewinding apparatus, mechanical shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, pneumatic means adapted to actuate the said shifting means, as aforesaid, and a tracker and apertures therein, and actuating connections from said apertures to said pneumatic means, and means adapted to interrupt the said mechanical shifting means

in its said reversing action from rewinding to winding at the said neutral intermediate position.

3. A music sheet winding and rewinding apparatus, mechanical shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, pneumatic means adapted to actuate the said shifting means, as aforesaid, and a tracker and apertures therein, and actuating connections from said apertures to said pneumatic means, and means adapted to interrupt the said mechanical shifting means in its said reversing action from rewinding to winding at the said neutral intermediate position, said interrupting means adapted to be thrown out of coöperation with said mechanical shifting means.

4. A music sheet winding and rewinding apparatus, shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, pneumatic means adapted to actuate the said shifting means, as aforesaid, and a tracker and apertures therein, and actuating connections from said apertures to said pneumatic means, and means for optionally interrupting the action of said reversing action from rewinding to winding and at the same time not interfering with the reversing action from winding to rewinding.

5. A music sheet winding and rewinding apparatus, shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, pneumatic means adapted to actuate the said shifting means, as aforesaid, and a tracker and apertures therein, and actuating connections from said apertures to said pneumatic means, and mechanical means for optionally interrupting the action of said reversing action from rewinding to winding and at the same time not interfering with the reversing action from winding to rewinding.

6. A music sheet winding and rewinding apparatus, and pneumatic means therewith adapted to reverse said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position of inaction of said winding and rewinding devices.

7. A music sheet winding and rewinding apparatus; and autopneumatic means therewith adapted to reverse said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position of inaction of said winding and rewinding devices.

8. A music sheet winding and rewinding apparatus; and pneumatic means therewith adapted to reverse said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position of inaction of said winding and rewinding devices, and a tracker having apertures therein, and connections from said apertures to said pneumatic devices.

9. A music sheet winding and rewinding apparatus, shifting means for reversing said apparatus from winding to rewinding and from rewinding to winding, and to a neutral intermediate position, and a stop positioned to determine the said neutral position of said shifting means.

10. A music sheet winding and rewinding apparatus, shifting means for reversing said apparatus from winding to rewinding and from rewinding to winding, and to a neutral intermediate position, and a stop positioned to determine the said neutral position of said shifting means, said stop adapted to be thrown in and out of coöperation with the said shifting means.

11. A music sheet winding and rewinding apparatus; mechanical shifting means for reversing said apparatus from winding to rewinding and from rewinding to winding, and to a neutral intermediate position, pneumatic means adapted to operate the said mechanical shifting means, and a mechanical stop positioned to terminate the movement of the said mechanical shifting means at the said neutral position.

12. A music sheet winding and rewinding apparatus; mechanical shifting means for reversing said apparatus from winding to rewinding and from rewinding to winding, and to a neutral intermediate position, pneumatic means adapted to operate the said mechanical shifting means, and a mechanical stop positioned to terminate the movement of the said mechanical shifting means at the said neutral position, said stop adapted to be thrown in and out of coöperation with said mechanical shifting means.

13. A music sheet winding and rewinding apparatus; mechanical shifting means for reversing said apparatus from winding to rewinding and from rewinding to winding, and to a neutral intermediate position, pneumatic means adapted to operate the said mechanical shifting means, and a mechanical stop positioned to terminate the movement of the said mechanical shifting means at the said neutral position, and a tracker having apertures therein, and connections from said apertures to said pneumatic means.

14. A music sheet propelling apparatus having winding and rewinding devices; means for shifting and clutching said devices from a rewinding to winding condition, and a stop positioned to interrupt said shifting movement at a neutral intermediate position of said shifting means at which position both said winding and rewinding devices are unclutched and at rest.

15. A music sheet propelling apparatus

having winding and rewinding devices; means for shifting and clutching said devices from a rewinding to winding condition; and a stop positioned to interrupt said shifting movement at a neutral intermediate position of said shifting means at which position both said winding and rewinding devices are unclutched and at rest, said stop adapted to be thrown in and out of coöperation with said shifting means.

16. A music sheet winding and rewinding apparatus, mechanical shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, a seat having two ports in a face thereof, a valve slidably mounted on the said face of said seat, connected to said shifting means, and slidable thereby, the two said ports positioned at two points of the sliding direction of the said valve and extended over both said ports when said shifting means is at its said position for winding, and said valve away from both said ports when said shifting means is in its said position for rewinding, and said valve covering only one of said ports when said shifting means is in its said neutral intermediate position, the last mentioned port adapted to control the full air service to the driving motor of the said apparatus, when said port is open, and the other said port adapted to control the cut-out of the air supply to the playing action when said other port is open.

17. A music sheet winding and rewinding apparatus; auto-pneumatic shifting means for shifting said apparatus from winding to rewinding; and control means to effect high air tension; said control means correlated with said shifting means and adapted to bring into action such high air tension during said shifting to rewinding, and to cause said high air tension to cease when the movement of said shifting means is completed.

18. A music sheet winding and rewinding apparatus; auto-pneumatic shifting means for shifting said apparatus from winding to rewinding; and control means to effect high air tension; an actuating duct to actuate said control means to high tension air control when said duct is open to said control means; and a movable member of said shifting means; said movable member adapted to close said duct when said movable member is at rest.

19. A music sheet winding and rewinding apparatus, shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof; an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position.

20. A music sheet winding and rewinding apparatus, shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof; an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position, and to be closed to electric current at both winding and rewinding control positions of said shifting means.

21. A music sheet winding and rewinding apparatus; shifting means for reversing said apparatus from rewinding to winding condition, or to a neutral intermediate position, an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position.

22. A music sheet winding and rewinding apparatus; shifting means for reversing said apparatus from rewinding to winding condition, or to a neutral intermediate position, an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position, and to be closed to electric current when said shifting means is at both said winding and rewinding conditions.

23. A music sheet winding and rewinding apparatus; automatic shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof; an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position.

24. A music sheet winding and rewinding apparatus; automatic shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof; an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position, and to be closed to electric current at both winding and rewinding control positions of said shifting means.

25. A music sheet winding and rewinding apparatus; automatic shifting means for reversing said apparatus from rewinding to winding condition, or to a neutral intermediate position, an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position.

26. A music sheet winding and rewinding apparatus; automatic shifting means for re-

versing said apparatus from rewinding to winding condition, or to a neutral intermediate position, an electric cut-out and connections therefrom to said shifting means, said cut-out adapted to be open against electric current when said shifting means is at its said neutral position, and to be closed to electric current when said shifting means is at both said winding and rewinding conditions.

27. A music sheet winding and rewinding apparatus; pneumatic means adapted to shift said apparatus from rewinding to winding, pneumatic means adapted to shift said apparatus from winding to rewinding, a tracker having an aperture therein and connections from said aperture to the said pneumatic means controlling the shift to the winding condition, and another aperture in said tracker and connections from said second aperture to the said pneumatic means for the shift to rewinding condition, the said aperture controlling the shift to winding condition located nearer to the position for one edge of a music sheet with which said tracker is adapted to be operated, than is the other said aperture to the position for the other edge of said music sheet.

28. A music sheet winding and rewinding apparatus; pneumatic means adapted to shift said apparatus from rewinding to winding, pneumatic means adapted to shift said apparatus from winding to rewinding, a tracker having an aperture therein and connections from said aperture to the said pneumatic means controlling the shift to the winding condition, and another aperture in said tracker and connections from said second aperture to the said pneumatic means for the shift to rewinding condition, the said aperture controlling the shift to winding condition located nearer to the position for an edge of a music sheet with which said tracker is adapted to be operated, than is the other said aperture to the position for an edge of said music sheet.

29. A music sheet winding and rewinding apparatus, mechanical shifting means for reversing said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position thereof, pneumatic means adapted to actuate the said shifting means, as aforesaid, and a tracker and apertures therein, and actuating connections from said apertures to said pneumatic means; means for controlling high tension air service to the said pneumatic means, and means combined with the said pneumatic means to actuate the said high tension air control during the reversing action by the said pneumatic means.

30. A music sheet winding and rewinding apparatus, and pneumatic means therewith adapted to reverse said apparatus from winding to rewinding, and from rewinding to winding, and to neutral intermediate position of inaction of said winding and rewinding devices; means for controlling high tension air service to the said pneumatic means, and means combined with the said pneumatic means to actuate the said high tension air control during the reversing action by the said pneumatic means.

31. A music sheet winding and rewinding apparatus; and autopneumatic means therewith adapted to reverse said apparatus from winding to rewinding, and from rewinding to winding, and to a neutral intermediate position of inaction of said winding and rewinding devices; means for controlling high tension air service to the said pneumatic means, and means combined with the said pneumatic means to actuate the said high tension air control during the reversing action by the said pneumatic means.

32. A music sheet winding and rewinding apparatus; and pneumatic means therewith adapted to reverse said apparatus from winding to rewinding, and from rewinding to winding, and to neutral intermediate position of inaction of said winding and rewinding devices, and a tracker having apertures therein, and connections from said apertures to said pneumatic devices; means for controlling high tension air service to the said pneumatic means, and means combined with the said pneumatic means to actuate the said high tension air control during the reversing action by the said pneumatic means.

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