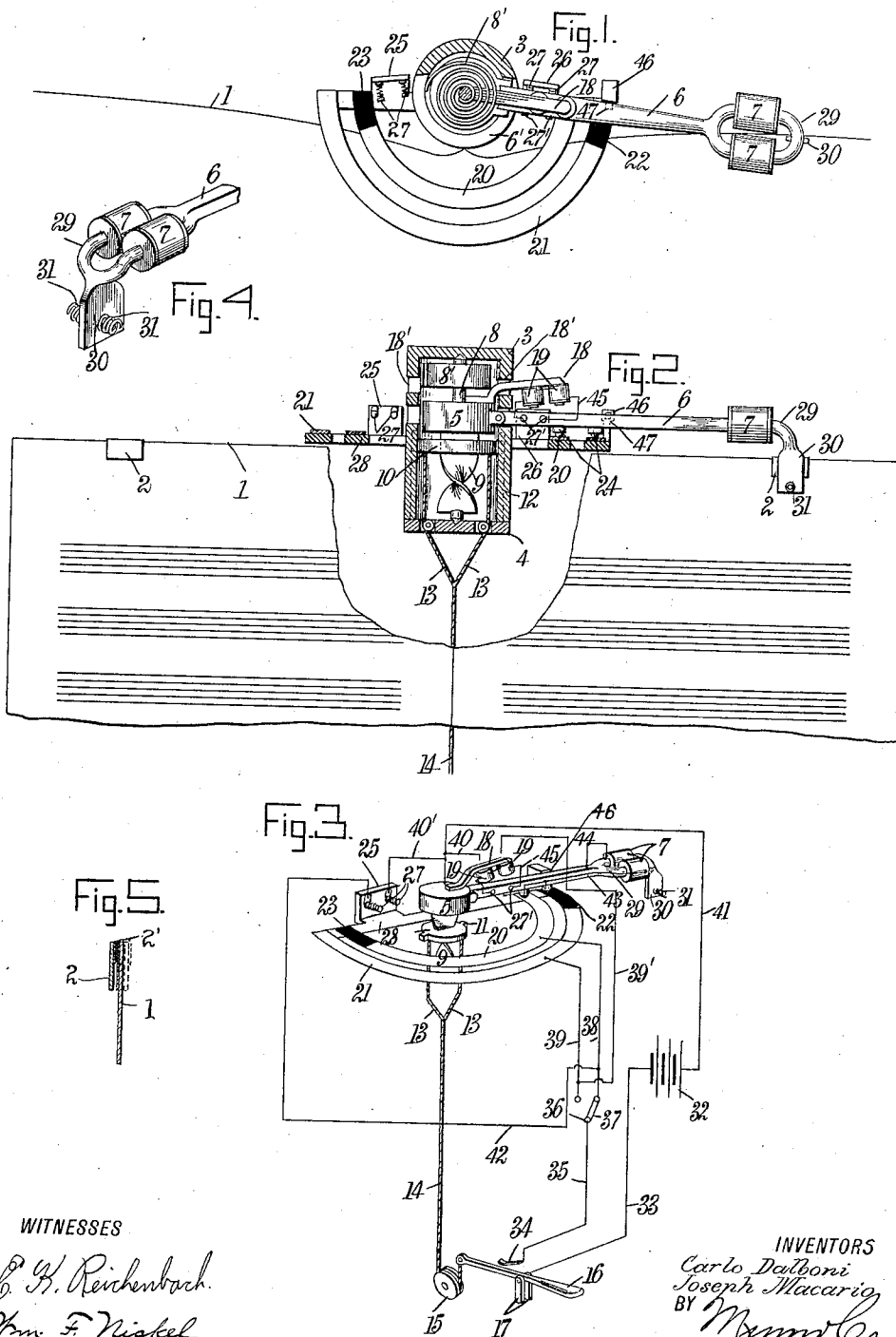


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 AUTOMATIC DEVICE FOR TURNING MUSIC.
 APPLICATION FILED NOV. 29, 1911.

1,032,817.

Patented July 16, 1912.



WITNESSES

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AUTOMATIC DEVICE FOR TURNING MUSIC.

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Application filed November 29, 1911. Serial No. 663,020.

To all whom it may concern:

Be it known that we, CARLO DALBONI and JOSEPH MACARIO, subjects of the King of Italy, and residents of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Automatic Device for Turning Music, of which the following is a full, clear, and exact description.

Our invention comprises new and improved means for turning music, whether in the form of sheets or bound together in the form of a book; and it comprises a novel combination of actuating elements by means of which a sheet or page of music can be turned in either direction; which is positively actuated to produce the desired result; which causes the sheets or pages to be engaged with sufficient force to move them from one position to another, and in which the actuating arm is always returned to its original position when released.

Reference is to be had to the accompanying drawings forming a part of this specification, in which the same characters of reference indicate the same parts in all the views.

Figure 1 is a top plan of our invention; Fig. 2 is a vertical section thereof in the plane including the operating arm when the same is in starting position. Fig. 3 is a perspective view thereof, showing the electrical connections by means of which the device is controlled; Fig. 4 is a detail view, showing the means for magnetizing the end of the operating bar and the pole piece at the end of the bar, and Fig. 5 is a vertical section of a magnetic attachment carried by each of the sheets to be turned.

On the drawings, 1 represents the sheets or pages of music, and to the top edge of each of these sheets is secured in proper position a plate 2 of magnetic metal. This plate may be in the form of a strip or piece of metal attached to each sheet 1 by means of a piece of cloth 2', such as silk, glued thereto and to the sheet. Our device for turning these sheets carrying the magnetic plates or members 2, comprises a casing, preferably cylindrical in form, indicated by the numeral 3, this casing being supported

on a suitable framework secured to the top of the stand on which the music 1 is carried. This casing 3 is hollow and is preferably closed at its lower end by means of a plate 4; and pivotally mounted inside of the casing 3 is a rotary head 5, to which is pivotally connected an operating arm 6. This operating arm 6 passes inside of the casing 3, and moves from side to side in a horizontal plane through a circumferential slot in the side of the casing, indicated by the numeral 6'. The outer end of the arm 6 carries a couple of electro-magnetic coils 7, and when these coils 7 are energized, the plates 2 will be attracted by the end of the arm 6, and when the arm 6 moves, the plates 2 and the sheets or pages 1 will move in turn with it. The head 5 is mounted upon a spindle 8, which has its ends rotating in recesses or bearings in the top and bottom of the casing 3, and is connected to a spring 8' adjacent its upper end, this spring 8' being secured to the inside of the casing and acting to hold the arm in the position shown in Figs. 1 and 3. The spindle 8 below the rotating head 5 has spiral ribs 9 formed thereon, and these spiral ribs are engaged by means of a reciprocating head 10 having diametrically-opposite lugs or guides 11, which move in vertical grooves 12 located diametrically opposite each other and formed on the inner walls of the casing 3. To the head 10 are connected the branch portions 13 of the cord 14, these branch portions passing out over anti-friction rollers mounted in openings in the bottom 4, and the cord 14 passing at its opposite end under a guide roller 15, and being connected to an operating lever or treadle 16, pivotally mounted on a fulcrum 17, which is of course located at the bottom of the stand on which the music-turning device is secured. The rotating head 5 also carries an arm 18, which projects outward through the wall of the casing 3 in a direction parallel to the arm 6; and this arm 18 being rigid with the rotating head 5, moves freely in a slot 18', similar to and of the same extent as the slot 6'. On the outer end of the arm 18 we arrange a couple of magnetic coils, the cores of these magnetic coils extending downward, so as to

exert a lifting force upon the arm 6, which is made of some material that is readily magnetized but does not retain its magnetism, such as soft iron.

5 The numerals 20 and 21 represent curved contact segments which are concentric with the casing 3 and approximately one hundred and eighty degrees in angular length. The contact segment 20 abuts a piece of insulation at the left extremity, indicated by the numeral 23, and the contact segment 21 abuts a similar piece of insulation at its right extremity, indicated by the numeral 22. The arm 6 has a pair of moving con-
10 tacts or brushes 24 projecting from its lower side in position to rub upon the upper surfaces of the segments 20 and 21, and the pieces of insulation 22 and 23.

The numerals 25 and 26 represent a pair of upstanding lugs or projections on each side of the cylinder 3, adjacent the ends of the segments 20 and 21, and each of these projections has a pair of spring contacts 27 thereon, these contacts 27 being of course
15 insulated from each other. The entire structure thus far described is mounted upon a supporting base which is indicated by the numeral 28.

The outer end of the arm 6 is shaped to
20 form a loop or eyelet indicated at 29, which carries the spools on which the magnetic coils 7 are wound; and this loop 29 terminates in a downward-extending pole piece 30 having springs 31 of some non-magnetic material projecting from its opposite faces. It will be understood that the arm 6 is supported in such position as to cause the pole
25 piece 30 to be in proximity to the magnetic plates 2 when the device is to be operated.

30 The numeral 32 represents a source of electric current connected to the treadle 16 by means of a conductor 33.

34 is a contact plate normally supported above the treadle 16, but arranged to touch
35 the same when the treadle is operated to pull the cord 14. From this contact plate 34 a conductor 35 leads to a binding post 36 at one end of a switch 37; and this switch closes the circuit through any one of the con-
40 ductors 38 and 39 connected to the contact segments 20 and 21, respectively.

39' is a conductor joined to the conductor 39 and leading to one of the contacts 27 carried by the projection 26, the other contact on this projection being joined by a wire or conductor 40 to a conductor 41 connected at one end to the head 5, which will be of conducting material, and at its other end to the other pole of the electrical source
45 32. 42 is a similar conductor connected to the wire 38 at one end and to one of the contacts of the projection 25 at the other, the other contact on the projection 25 being joined by a wire 40' to the return conductor

41, leading to the battery, as in the first instance. 65

The numeral 27' represents a pair of contacts carried by the arm 6, these contacts being the terminals of the magnetic coils 19, to which they are connected by short
60 lengths of wires or conductors 45. It will be understood that these contacts 27' will be insulated from the arm 6 in practice.

43 is a conductor connecting the brushes 24 to the magnet coils 7, grounded on the
65 arm 6 by a connection 44.

Adjacent the starting position of the arm 6 we preferably arrange a stop 46, having a spring-pressed pin 47 mounted therein. The arm 6 normally rests upon this pin 47, which
70 engages the under side thereof and holds the arm 6 in slightly inclined position, with the outer end elevated just enough to make the lower edge of the pole piece 30 to be approximately level with the top edge of the
75 music 1.

To operate the device the switch 37 is moved to connect the conductor 38 in circuit, and the musician then presses down upon the treadle 16 with his foot, pulling upon
80 the cord 14 to cause the head 10 to move downward in the casing 3. The head 10 being in engagement with the spiral ribs 9 on the spindle 8, will rotate the spindle 8, and through the head 5 thereon swing the
85 arm 6 in a counterclockwise direction. The operating of the treadle 16 first tightens the cord 14 without producing any downward movement of the head 10, and comes in contact with the brush 34, to complete the
90 circuit of the battery or other source of electricity to the electro-magnetic coils 7 and 19. At this time the outer end of the arm 6 must be elevated to such an extent as to have the lower end of its pole-piece 30
95 about on a level with the top of the sheets 1. This is accomplished either by lifting the arm 6 by hand until it rests upon the pin 47, or by moving the switch 37 over to connect the conductors 35 and 39. This will allow
100 current to flow from the source through the conductors 33, 34, 35, 39, 39', the contacts 27 carried by the plate 26, the electro-magnetic coils 19, the conductor 40 and the conductor 41 back to the source 32. The spring
105 contacts 27 will project out far enough to engage the contacts 27', which extend through the opposite sides of the arm 6, even when the arm is held spaced a slight distance from its extreme starting position by the
110 pin 47. The energizing of the magnetic coils 19 will lift the arm 6, and as soon as this arm is lifted above the pin 47, the spring 8' will cause it to be returned to its extreme starting position against the force of the
115 spring contacts 27, and the elevating movement of the outer end of this arm will cause the springs 31 to engage the lower edge of

the plate 2, and turn up the plate with it, the movement of the plate 2 being permitted through its flexible connection 2' with the sheet 1.

5 In order to operate the device, the switch 37 must now be moved to connect the conductors 35 and 38; that is, in the position shown in Fig. 3. This will cause the circuit to be broken through the magnets 19, but
10 the arm 6 will still be held in raised position, owing to the spring-pressed pin 47. When the treadle 16 is now depressed, the cord will pull down the head 10 and exert a force on the spiral ribs 9, to turn the arm 6 in a
15 counter clockwise direction. After the first instant of movement the arm 6 will pass off the pin 47 and drop down into the position shown in Figs. 2 and 3, bringing one of the contact brushes 24 into contact with the segment 20.
20 Current now flows from the source 32, through the conductor 38, brush 24, wire 43, through the coil 7, wire 44, arm 6, head 5 and conductor 41, back to the source, completing the circuit. This energizes the coil
25 7 and magnetizes the pole piece 30, which at this time has not moved too far away from the plate 2 to attract the same. The pull of the pole-piece 30 upon the plate 2 will now cause the sheet of music 1 to be
30 turned with it, and during the turning movement the plate 2 will occupy such a position that it will normally lean along its free edge against the upper part of the pole-piece 30, or the lower end of the loop 29.
35 When the arm 6 has reached the end of its movement after passing through approximately one hundred and eighty degrees, the brush 24 will pass off the segment 20 upon the insulating section 23, thus breaking the
40 circuit through the coils 9 and demagnetizing the pole-piece 30. About this time the spring 31 on the far side of the arm will strike the sheets of music or binding of the book on the left side, referring to Fig. 2,
45 thus cushioning the impact of the arm 6, and bringing it easily to a stop. About this time also, the contacts 27' carried by the arm 6 move against the spring contacts 27 carried by the support or plate 25. This reestablishes
50 the circuit through the coils 19 by way of the conductor 38, conductor 42, wire 40' and conductor 41, back to the source. The result is that the arm 6 again has its outer end lifted, and the spring 31 on the front side
55 of the pole-piece 30 will engage the rear surface of the plate 2, lifting the same far enough to cause it to revolve around the upper edge of the sheet 1, and hang over the edge thereof upon the opposite side of
60 the same, as shown in dotted lines in Fig. 5. The operator or musician then releases the treadle 16, and the spring 8' rotates the spindle 8 and causes the arm to return to its original position. As soon as the arm moves

away from the contacts 27, breaking the 65 connection between the same and the contacts 27', which project through the opposite side of the arm 6, the magnet coils 19 will again be deenergized, and the arm will again sink to horizontal position. When it 70 reaches its starting position it is again lifted as before, and the next sheet can be turned in the same way.

It will be understood that the section of insulation 23 is long enough to keep the 75 circuit to the coils 7 interrupted until the arm 6 has traveled on its return movement to such an extent that the restoration of the circuit to the coils 7 and the consequent re-magnetizing of the pole-piece 30 will have 80 no effect upon the plate 2 of the turned sheet, and consequently there will be no tendency of the arm 6 on its return to starting position, to carry the sheet which it has just turned, back with it.

85 If it be desired to turn a sheet of music back to re-play a certain selection or part thereof, the switch 37 is moved over to connect the conductors 35 and 39, before the treadle is released, to permit the spring 8' 90 to take effect and return the arm. Current will now flow from the source 32 through the conductor 39, segment 21, the other or outer brush 24, conductor 43, coil 7, conductor 44, arm 6, head 5 and conductor 41 to the source. 95 This will immediately re-magnetize the coil 7 before the arm 6 has moved the pole-piece 30 too far away from the magnetic plate 2, and as a result, when the treadle 16 is released and the head revolved by the spring 100 8', the arm 6 will carry the sheet 1 with it when it returns to the position shown in Figs. 1 and 3. As soon as the outer brush 24 moves upon the insulated contact section 22 at the end of the segment 21, the circuit 105 will be broken to the coil 7, and the pole piece 30 will be deenergized in the course of the completion of the return movement, the same as in the former case. The above operations are repeated as long as there is 110 any need for the device, and afterward the switch 37 is moved to open position, to prevent waste of the current furnished by the source 32.

We wish to have it understood that we may 115 make certain changes in the shape, size and arrangement of the parts such as fairly fall within the scope and spirit of our invention.

Having thus described our invention, we claim as new and desire to secure by Letters 120 Patent:

1. In a device of the kind described, the combination of an operating arm, means for causing said arm to engage the edge of a sheet of music, means for pivotally mounting said arm, means for causing said arm to swing on said pivotal mounting means, to 125 turn the sheet, magnetic means for attract-

ing said arm and elevating the outer end thereof when the same has finished its turning movement, and means for closing the circuit through said magnetic means when the arm has finished its turning movement, whereby the said arm will be enabled to clear the edge of said sheet and be returned to starting position.

2. In a device of the kind described, the combination of an operating arm, means for magnetizing the outer end of said arm, magnetic means adapted to be secured to the edge of a sheet of music, pivotal mounting means for said arm, said arm being connected to said mounting means to permit the same to be tilted upward, magnetic means for attracting said arm and elevating the outer end thereof, means for swinging said arm around said pivotal mounting means, and means for deenergizing the magnetic means for elevating the outer end of said arm before said arm is moved, said arm having cushioning means at its outer end and projecting from both sides thereof.

3. In a device of the kind described, the combination of an operating arm, a head upon which the same is mounted, a rotatable spindle supporting said head, said spindle having spiral ribs thereon, a reciprocating member engaging said spiral ribs, means for holding said reciprocating member against rotation, means connected to said reciprocating means to move the same, a lever for operating said last-named means, a pair of contact segments concentric with said spindle, one of said segments extending past the other at one end and the other segment extending past the first at the opposite end, insulating means at one end of each of said segments, said insulating means for each segment lying adjacent the extended end of the other segment, a pair of sliding contacts carried by said arm to move along said segments, a magnet coil on said operating arm connected to said sliding contacts, a source of electric current supply, a switch, conductors leading from said switch to each of said segments, and means controlled by said lever for closing the circuit to the switch, whereby the magnetizing coil on the operating arm can be energized when the arm is being moved forward or backward, and deenergized when it reaches the end of its movement in either direction.

4. In a device of the kind described, the combination of a member of magnetic material, means for pivotally connecting the same to a sheet of music to be turned, an operating arm for turning said sheet, means for moving said arm, and means for causing said magnetic means to be magnetically attracted to be engaged by and moved by said arm when the arm is actuated.

5. In a device of the kind described, the

combination of a magnetic member, means for pivotally connecting the same to the top edge of a sheet of music to enable the same to depend below the top edge, an operating arm, means for moving said arm, and means for causing said magnetic member to be magnetically attracted to be engaged by and moved by the arm when the arm is operated to turn said sheet.

6. In a device of the kind described, the combination of a magnetic member, means for pivotally connecting the same to the top edge of a sheet of music, whereby said member can depend below said edge, an operating arm, means for moving said arm, and means carried by the said arm for magnetically attracting said member to the arm when the arm is moved to turn said sheet.

7. In a device of the kind described, the combination of an operating arm, a head upon which the same is mounted, a rotatable spindle for supporting said head, said spindle having spiral ribs thereon, a reciprocating member engaging said ribs, means for holding said spindle against rotation, whereby when said reciprocating member is moved the arm will be swung on said spindle as an axis, means connected to said reciprocating means to move the same, an operating lever connected to said last-named means, magnetizing means adjacent the outer end of said arm, an electric circuit through said magnetizing means, and switching means controlled by said lever for closing said circuit.

8. In a device of the kind described, the combination of an operating arm, means for swinging said arm around an axis, a pair of conducting segments concentric with said axis, one of said segments extending past the other at one end and the other segment extending past the first at the opposite end, insulating means at one end of each of said segments, said insulating means for each segment lying adjacent the extended end of the other segment, a pair of sliding contacts carried by said arm to move along said segments, a magnet coil on said arm connected to said sliding contacts, and an electric circuit having branches including said contacts, said segments and said coil, to enable the magnetizing coil to be energized when the arm is being moved forward or backward, and deenergized when it reaches the end of its movement in either direction.

9. In a device of the kind described, the combination of an operating arm, means for pivotally mounting said arm, means for causing said arm to swing on said pivotal mounting means to turn a sheet of music, said arm being hinged to the means for mounting the same, magnetic means for attracting said arm and elevating the outer end thereof when the arm has finished its

turning movement to enable it to clear the edge of said sheet, an electric circuit including said magnetic means, a contact in said circuit, and a contact carried by the arm, to
5 engage the first contact when the arm has finished its turning movement, to close said circuit.

10 10. In a device of the kind described, the combination of a member of magnetic material, means for pivotally connecting the same to a sheet of music to be turned, and

an operating arm for engaging said member to move the sheet.

In testimony whereof we have signed our names to this specification in the presence of 15 two subscribing witnesses.

CARLO DALBONI.
JOSEPH MACARIO.

Witnesses:

DEMETRIO BIMALDI,
PASQUINO MANTONI.

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