A. E. BABCOCK.

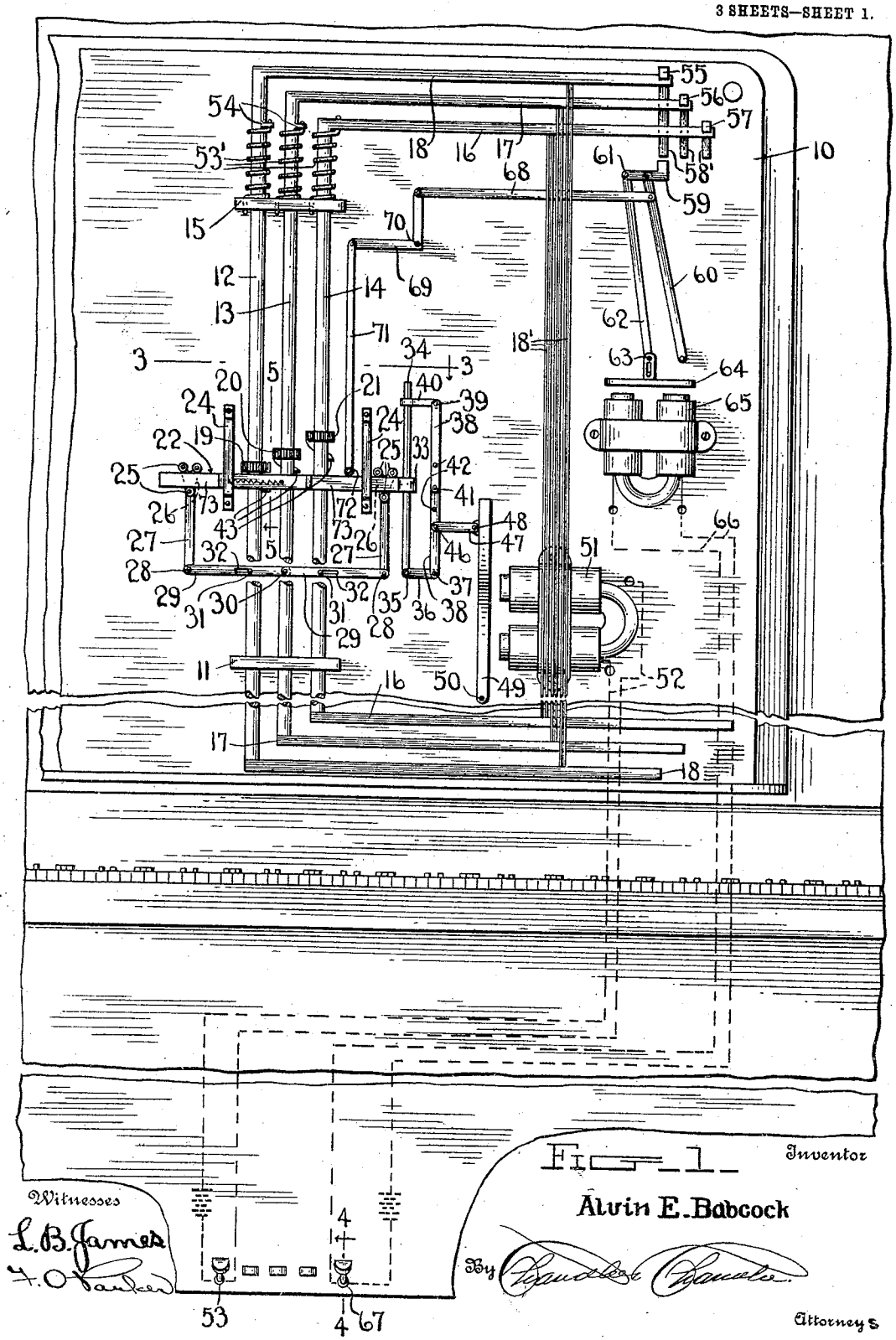
MUSIC LEAF TURNER.

APPLICATION FILED JAN. 21, 1909.

950,037.

Patented Feb. 22, 1910.

3 SHEETS—SHEET 1.



Witnesses

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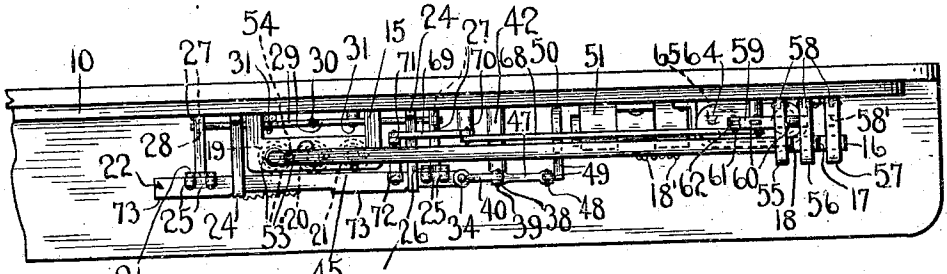

Fig. 2.

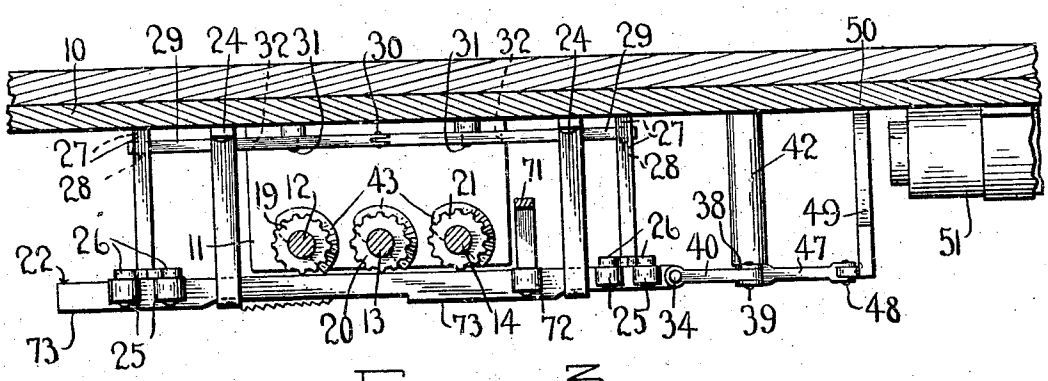

Fig. 3.

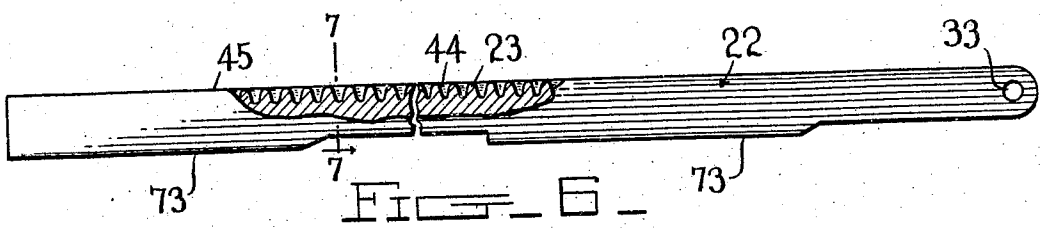

Fig. 6.

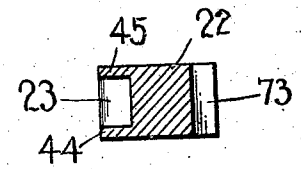

Fig. 7.

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3 SHEETS—SHEET 3.

FIG. 8.

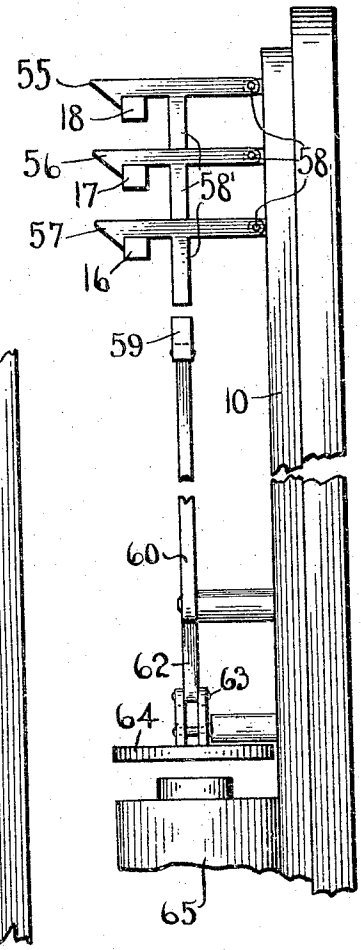


FIG. 5.

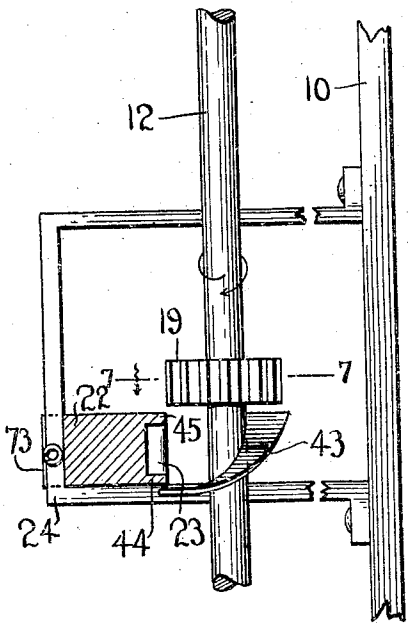


FIG. 9.

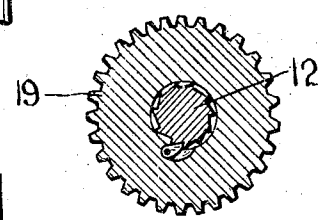
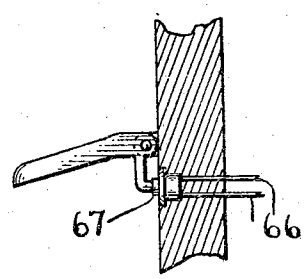


FIG. 4.



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UNITED STATES PATENT OFFICE.

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MUSIC-LEAF TURNER.

950,037. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed January 21, 1909. Serial No. 473,512.

To all whom it may concern:

Be it known that I, ALVIN E. BABCOCK, a citizen of the United States, residing at Battle Creek, in the county of Calhoun, State of Michigan, have invented certain new and useful Improvements in Music-Leaf Turners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to a music leaf turner and more particularly to the class of electro-mechanical music leaf turners.

The primary object of the invention is the provision of a music leaf turner which consists in mechanical means adapted to turn the leaves either backwardly or forwardly and electrical means to effect the turning of the leaves forwardly and to permit the automatic turning of the leaves backwardly as the occasion may demand.

Another object of the invention is the provision of a music leaf turner which consists in mechanical means for successively turning the leaves either forwardly or backwardly in a positive manner, an electrically controlled means for actuating the said mechanical means to effect the turning of the leaves, means for locking the mechanical means after having turned the leaves in one direction and electrical means adapted to actuate the locking means to successively release the same to permit automatic backward turning of the leaves, the said electrical means being under the control of an operator.

In the drawings accompanying and forming part of this specification is illustrated the preferred form of embodiment of the invention which to enable those skilled in the art to practice the invention will be set forth at length in the following description while the novelty of the invention will be included in the claims succeeding the said description, however, it is to be understood that changes, variations and modifications may be made such as come properly within the scope of the claims succeeding the description without departing from the spirit of the invention.

In the drawings: Figure 1 is a front elevation of a music leaf turner constructed in accordance with the invention. Fig. 2 is a top plan view thereof. Fig. 3 is a sectional view on the line 3—3 of Fig. 1. Fig. 4 is a further sectional view on the line 4—4 of Fig. 1. Fig. 5 is a sectional view on the line 5—5 of Fig. 1. Fig. 6 is a top plan view of the vertically and horizontally movable rack member. Fig. 7 is a sectional view of the rack member on the line 7—7 of Fig. 6. Fig. 8 is a side elevation of the upper portion of the music leaf turner. Fig. 9 is a section on the line 7—7 of Fig. 5.

Similar reference characters indicate corresponding parts throughout the several views in the drawings.

In the drawings the numeral 10 designates the supporting plate of the music leaf turner which is designed to be secured to the front of the case of a piano or other musical instrument in juxtaposition to the ordinary music support and is adapted to carry the operative mechanical elements of the device or apparatus. Projecting at right angles from the supporting plate 10 is a bearing piece or base 11 for receiving the lower journal ends of vertically disposed alining shafts 12, 13 and 14, the same arranged in substantially close relation to each other and journaled near their upper ends in a cross head 15, the said shafts being of different lengths. Each of said shafts 12, 13 and 14 carries rigid right angularly disposed upper and lower arms 16, 17 and 18 respectively, which are provided with wire stringers 18′ for securing the leaves of a book of music or the like thereto. Surrounding the said shafts are left hand ratchet controlled pinions 19, 20 and 21 which are arranged in a step by step manner upon the shafts and are successively engaged by a horizontal rack member 22 the same being in the form of a bar and having formed on one of its side edges a plurality of rack teeth 23 which are adapted to mesh with the teeth of the pinions respectively. The said rack member is designed for vertical movement in brackets or yoke pieces 24 fixed to the supporting plate at opposite sides of the vertical shafts. Engaging the rack member 22 near opposite ends thereof and contacting with the upper and lower faces thereof are friction rollers 25 the same journaled on forked extensions 26 of L-

shaped arms 27 the lower ends of which are pivotally connected as at 28 to toggle levers 29 which latter have their inner adjacent ends hinged by a pivot pin 30 and which levers are connected to the supporting plate 10 by guide pins 31 working in elongated slots 32 in said levers a distance removed from their inner hinged ends. The right hand end of the bar is formed with a perforated ear 33 which engages and is adapted for sliding movement on a vertical rod 34 which latter is pivoted as at 35 to a link 36 the same also pivoted as at 37 to one of a pair of toggle levers 38 which remaining lever of the pair has pivoted thereto as at 39 a link 40 provided with a perforation through which passes the upper end of the rod 34 which latter at all times is held in a vertical plane. The toggle levers 38 at their inner adjacent ends are hinged as at 41 and on opposite sides thereof and at a distance removed from the same are pivot pins 42 connecting the toggle levers to the supporting plate 10 of the apparatus.

Below each of the pinions 19, 20 and 21 and extending close to the same is a spiral vane or rib 43 the trend of which extends around one-half of the diameter of each of the shafts and the said vanes or ribs are adapted to act upon the horizontal rack member 22 by engaging a lower flange 44 extending the entire length of the said rack member and being of the same length as the teeth 23 thereof to successively raise the rack member to a position to engage the pinions 19, 20 and 21 and the said rack member is also formed on its opposite upper face with a flange 45 corresponding to the said flange 44 to engage the upper surfaces of the pinions 19, 20 and 21 when the rack member has been automatically thrown into mesh with the said pinions so as to maintain the rack member in a plane or level with the pinions to actuate the same.

Connected by a pivot 46 to the lowermost lever of the toggle levers 38 is a pull link 47 the same also connected by a pivot 48 near the free end of an armature 49 the latter having its lower end pivoted as at 50 to the supporting plate 10 and which armature 49 is adapted to be actuated or attracted by an electro-magnet 51 suitably mounted upon the said supporting plate and which magnet is energized or controlled by an electric circuit 52 the same adapted to be closed by a push button switch 53 disposed at any convenient place upon the casing of a piano or other musical instrument.

Normally the music leaf supporting arms 16, 17 and 18 are swung to the right and are held under tension by coiled resetting springs 53′ the same surrounding the shafts 12, 13 and 14 each having its upper end engaging a lug 54 projecting from each of the shafts and its opposite end having its bearing or being fixed in the cross head 15 and the said arms are held in this position by catches or locking members 55, 56 and 57 each being in the form of a hook and having its inner end pivoted as at 58 to the supporting plate 10 of the apparatus or device. The said locking members are arranged in a step by step manner to lie in the planes of the paths of movements of the said arms to engage the same and depending from the locking members are shanks or stems 58′ the latter terminating in a similar plane to be acted upon or engaged by a shiftable trip device 59, the latter pivotally connected to the upper end of a rocking bar or lever 60 the lower end of which is pivotally connected to the supporting plate and also connected to the said trip device by a pivot 61 is the upper end of a link rod 62 the latter having its lower end pivoted as at 63 to an armature 64 controlled or attracted by an electro-magnet 65 energized and arranged in an electric circuit 66, the latter closed by a push button 67 suitably mounted upon the casing of a piano and in close relation to the push button 53 of the other electric circuit.

Connected to the rocking rod or lever 60 is a shiftable rod 68 the latter pivoted to a bell crank lever 69 the same fulcrumed as at 70 to the supporting plate 10 and also having pivotally connected thereto a depending arm 71 carrying at its lower end a friction roller 72 which arm is arranged in the path of movement of the rack member 22 so that upon vertical ascent or descent of the same the trip device 59 will be shifted in a position to engage the several stems or shanks 58′ of the locking members to release the arms supporting the music leaf upon the energizing of the electro-magnet 65 under the control of the operator.

On the rack member 22 and in spaced relation to each other are swells or cam shoulders 73 the same being disposed on the said rack member at the edge opposite to the disposition of the teeth 23 thereof and which cam shoulders 73 upon movement of the rack member in a horizontal plane are adapted to be acted upon by the brackets 24 to bring the teeth 23 in mesh with the pinions 19, 20 and 21 respectively, to effect the backward turning of the music leaf when occasion demands.

In operation, and presuming that the leaves of music sheets or a book are connected to the turning arms 15, 16 and 17, respectively, and that the latter have been turned to the right and held in such positions by the locking members 55, 56 and 57 and now it is desired by the operator to turn the leaves to the left as is customary, the said operator presses the push button 67 thereby closing the circuit 66 to energize the magnet 65 whereupon the armature 64

will be attracted by the said magnet causing the trip device 59 to move into engagement with the stem 58′ carried by the locking member 55 thus raising the same out of engagement with the arm 16 which latter will turn the front sheet of music to the left by action of the spring 53′ and during this movement the shaft 12 will rotate to the left and its pinion 19 will be locked thereto to move in the direction with the same and in this movement the spiral rib 43 of said pinion will act upon the rack member 22 raising the same in the plane of the said pinion 19 where the said rack member will be held until it is desired by the operator to turn a second leaf of music by again pressing the button 67 to close the circuit 66 for energizing the electro-magnet 65 which will attract the armature to actuate the trip device, however, previous to pressing the said button due to the vertical movement of the rack member 22 the said trip device 59 has been shifted through the medium of the bell crank lever 69 and the depending arm 71 in the path of movement of the rack member to a position directly under the stem of the locking member 56 so as to raise the same for releasing the turning arm 17 of the device or apparatus and the operation is repeated in this manner until all of the leaves have been turned to the left. Now, after the successive operation of the turning arms 16, 17 and 18 respectively, the said rack member 22 has reached a level or plane with the pinion 21 and should it be desired to turn backwardly the leaves of music the operator presses the push button 53 to close the electric circuit 52 thereby energizing the electro-magnet 51 which will attract the armature 49 thus drawing or pulling to the left its link 47 connected to the toggle levers 38 supporting the vertical rod 34 which latter moves to the right the horizontal rack member 22 and during which movement the cam shoulders 73 thereof are acted upon by the brackets 24 so as to move the said rack member laterally to bring its rack teeth 23 into mesh with the pinion 21 and during continued movement of the rack member the shaft 14 is caused to rotate through the medium of its pinion 21 to the right and thereby turn the arm 16 in a similar direction to be engaged by the locking member 57 which will maintain the arm and the leaf of music supported thereby in this position. To turn the arms 17 and 16 in a successive manner to the right the operation is repeated. It is obvious the spiral rib on the pinion 21 during the turning movement of the arm 18 to the right will be shifted to a position opposite the rack bar which latter by gravity will fall to a level or plane with the pinion 20 on the adjacent shaft 13 and the spiral ribs of the remaining pinions will also be shifted likewise in successive manner to permit the said member to descend to its first or normal position as the turning arms are released and moved to the left of the device or apparatus.

What is claimed is—

1. A music leaf turner having a sheet holder, means for turning the holder in one direction, means for locking the holder when turned in one direction, resetting means for turning the holder in an opposite direction after being released, electro-magnetic means actuating said first-mentioned means, and independent electro-magnetic means for releasing said locking means.

2. A music leaf turner having sheet holders consisting of a plurality of shafts having right angularly disposed arms, pinions carried by the shafts, said pinions being disposed in different planes with respect to each other, toothed means adapted to be moved successively in the planes of said pinions, means for actuating the said toothed means to impart movement to the shafts in one direction, means for moving the toothed means successively in the planes of the pinions, means for moving the shafts in a reverse direction, locking means arranged in the path of movement of the arms to engage the same and hold the shafts against reverse movement, means controlled by the toothed means to bring the same into position for tripping the locking means, and means controlling the said last mentioned means.

3. A music leaf turner comprising a plurality of shafts, turning arms carried by said shafts, pinions mounted upon said shafts, and disposed in different planes with respect to each other, a toothed member movable into the planes of the pinions, means for raising the toothed member into the planes of the pinions, means acting on the toothed member to bring the same in mesh with the pinions, an electric circuit controlled means for imparting movement to the toothed member to turn the shafts, locking means arranged in the path of movement of the turning arms, a trip device for releasing said locking means and shifted by the toothed member, and an electric circuit controlled means actuating said trip device to release the arms.

4. A music leaf turner comprising horizontally swinging sheet holders, means for successively turning the said holders to the right, electrically controlled means actuating said turning means, spring means for turning the holders to the left, locking means arranged in the path of movement of the holders to engage the same when moved in the first named direction, and electrically controlled means for releasing the said locking means to permit movement of the holders in the second named direction.

5. A music leaf turner comprising a plu-

rality of substantially adjacent vertically disposed turning shafts, sheet supporting arms carried by said shafts, mechanism for turning the shafts in one direction, locking means engaging the arms for holding the same when turned in one direction, resetting means for the said arms to turn the same in the opposite direction, electro-magnetic means controlling said turning mechanism, and electro-magnetic means for releasing the locking means.

In testimony whereof, I affix my signature, in presence of two witnesses.

ALVIN E. BABCOCK.

Witnesses:
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AUBREY L. BABCOCK.