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LEAF TURNER.

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1,057,565.

Patented Apr. 1, 1913.

2 SHEETS-SHEET 1.

Fig. 1.

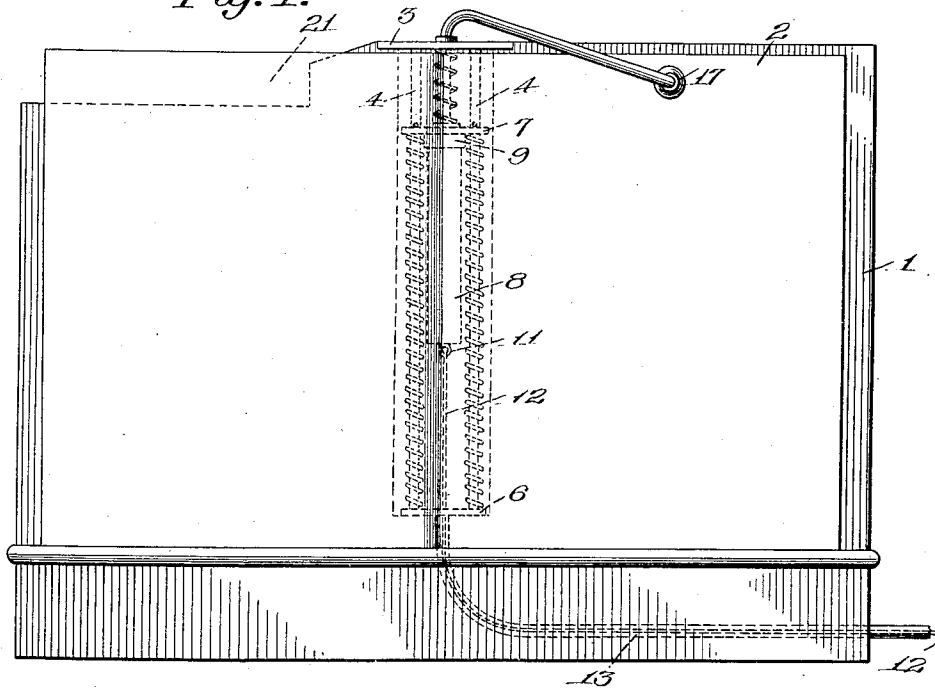
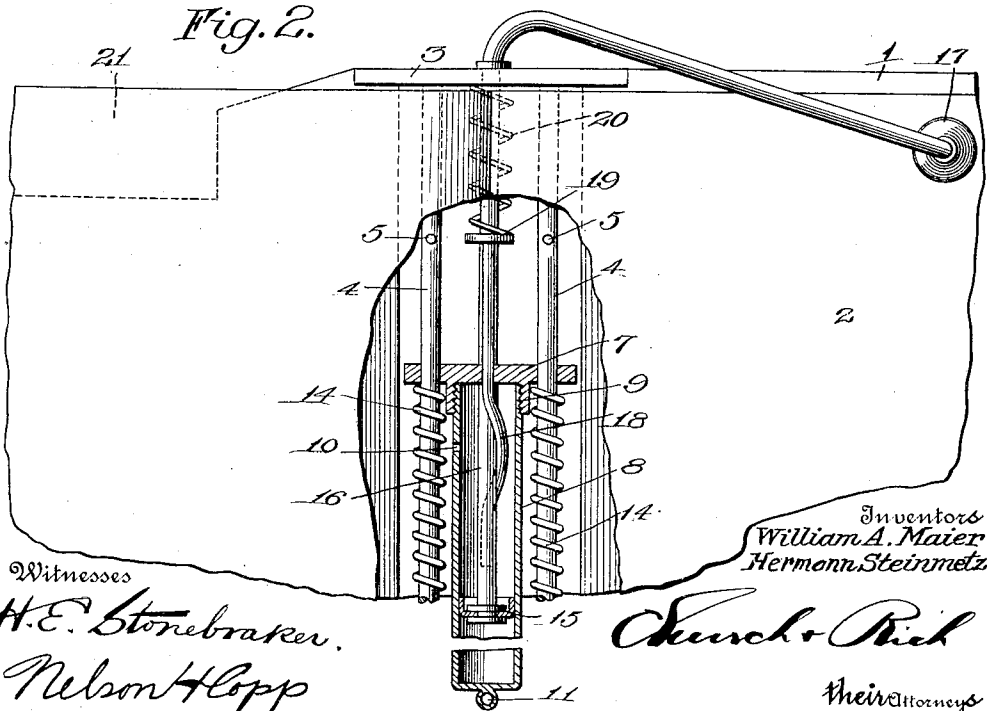


Fig. 2.



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2 SHEETS-SHEET 2.

Fig. 3.

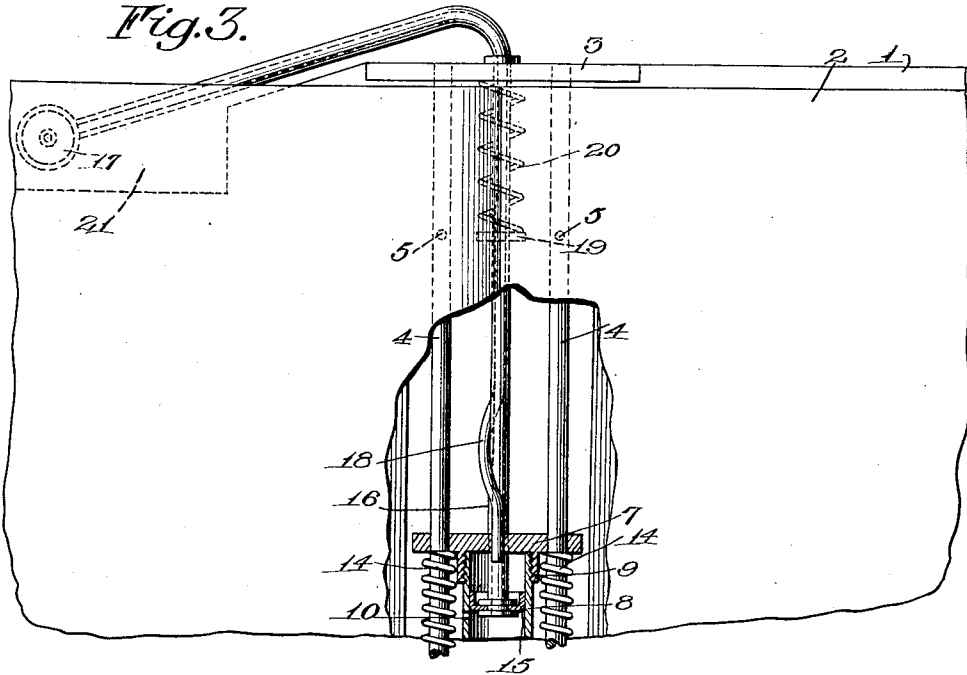


Fig. 4.

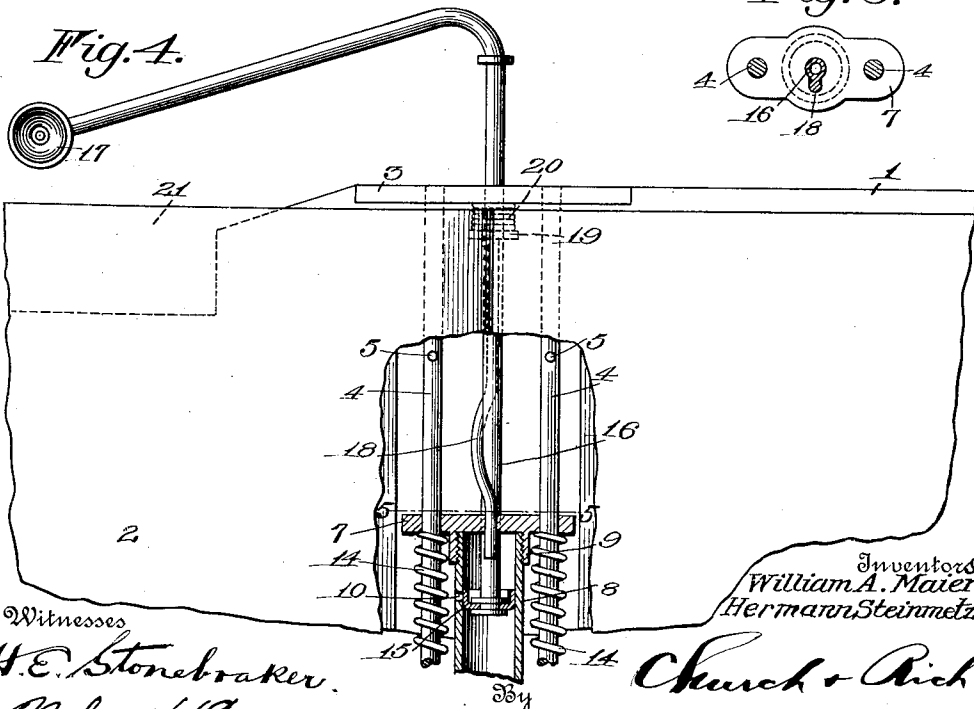
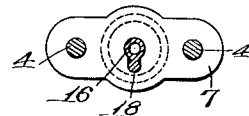


Fig. 5.



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LEAF-TURNER.

1,057,565.

Specification of Letters Patent.

Patented Apr. 1, 1913.

Application filed April 10, 1911. Serial No. 619,954.

To all whom it may concern:

Be it known that we, WILLIAM A. MAIER and HERMANN STEINMETZ, both of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Leaf-Turners; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of the specification, and to the reference-numerals marked thereon.

The present invention relates to leaf turners and has for its object to provide a simple, improved mechanism particularly adapted for use in connection with sheet music, the arrangement of the parts being such that a single leaf-engaging member may be employed to operate successively on the different leaves.

To these and other ends the invention consists in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

Figure 1 is a view in elevation of one embodiment of the invention, showing the normal position of the leaf-engaging member; Fig. 2 is a view in elevation, partly in section, showing the position of the parts upon the initial operative movement; Fig. 3 is a similar view, showing the leaf-engaging member fully turned, and just prior to its elevated or final position, before returning to normal position; Fig. 4 is a similar view, showing the leaf-engaging member in its last position, before returning to normal position, and Fig. 5 is a sectional view on the line 5—5 of Fig. 4.

Similar reference numerals in the several figures indicate similar parts.

The present embodiment of the invention is illustrated in connection with a frame, or base 1, which supports the sheets to be turned, the latter being illustrated at 2. A forwardly projecting plate 3 is arranged on the base, and extending downwardly from the plate 3 are the guides 4 which carry stops 5, and are connected at their lower ends by the cross-piece 6. A cross-head 7 is slidably mounted on the guides 4 and carry a cylinder 8 which, in the present embodiment, is threaded into the collar 9 of the cross-head. The cylinder is provided with an opening 10, and has at its lower end an eye

11 to which is secured the flexible operating member 12, which latter extends downwardly through an opening in the cross-piece 6 and out through a guiding tube 13 which leads from the cross-piece 6 to a convenient point of operation. Springs 14 are arranged between the cross-head 7 and the cross-piece 6, serving to hold the cylinder normally raised into engagement with the stops 5, as shown in Fig. 1.

A piston 15 is arranged within the cylinder 8, being mounted, in the present embodiment, on a hollow support 16 which extends upwardly through an opening in the cross-head and the plate 3, being bent downwardly at its upper end, and carrying at its outer extremity a leaf-engaging member 17, which preferably comprises a flexible cup adapted to form a close engagement with the sheet. The support 16 is provided with a longitudinally extending cam 18 which coöperates with an opening in the cross-head, and is formed so as to effect rotation of the hollow support when the cylinder 8 is moved downwardly. Arranged between the plate 3 and the flange 19, secured to the support 16, is a compression spring 20 which operates to hold the piston and the support in normal position, as shown in Figs. 1 and 2. A cutaway portion 21 is provided on the base, or frame, to permit the leaf-engaging member to complete its movement relatively to the base, or frame.

The operation of the device is as follows: The parts being arranged as shown in Fig. 1, with sheets positioned on the base, or frame, the flexible operating member 12 is pulled to effect downward movement of the cylinder 8. This operation initially moves the cylinder to the position shown in Fig. 2, and the piston being thus far held stationary, a partial vacuum is created between the piston and the lower end of the cylinder, causing a withdrawal of air through the hollow support 16 from between the leaf and the leaf-engaging member 17, which latter grips the leaf preparatory to turning the same. As the cylinder is moved farther in a downward direction, the cam 18 engages the opening in the cross-head 7 and thus causes the support 16 to be rotated, turning the leaf-engaging member and with it the leaf which is held by suction. At the limit of the turning movement of the leaf-engaging member, the piston will have reached a position immediately above the opening 10

of the cylinder, as shown in Fig. 3, breaking the vacuum and also releasing the leaf from the leaf-engaging member. At the same time, the operating member 12 is released and the cross-head is immediately returned to its normal position by the action of the springs 14. The initial upward movement of the cross-head causes the latter to engage the cam 18, with sufficient force to effect an upward movement of the support 16, while the piston is closing the opening 10, as shown in Fig. 4. The upward movement of the support is aided and insured by the compression of air between the piston and the lower end of the cylinder, as the latter is raised with the cross-head, since the opening through the hollow support is of such size as to permit only a slow passage of air from the cylinder, the final movement causing the leaf-engaging member to be turned by means of the cam 18 until the cross-head reaches its uppermost position, the compression spring 20 acting at the same time to lower the leaf-engaging member from the elevated position of Fig. 4 to the normal position of Fig. 2, as it is turned back to engage another leaf.

By the structure just disclosed, it will be seen that the leaf-engaging member lies normally in contact with one of the leaves to be turned, and by the automatic operation set forth turns the leaf, and is then raised out of engagement therewith so as to return, and thereafter lowered to normal position in engagement with another leaf.

The operating member 12 may be connected to a treadle, or other foot actuating device, or may be otherwise controlled, as desired.

It will be apparent that the invention affords a very simple and readily operated device for turning the leaves of a book, or of sheet music, in a ready and efficient manner, so as to obtain a quick action, and without causing injury to the sheet.

We claim as our invention:

1. In a leaf turner, the combination with a suction-member for engaging a leaf, of a rotary and longitudinally movable support for the suction-member and a device for operating the support, said device being in engagement with the support and having movement relative thereto and longitudinally of the rotating axis thereof.

2. In a leaf turner, the combination with a suction-member for engaging a leaf, of a rotary and longitudinally movable support for the suction-member, and reciprocating means for moving the suction-member, said means being in engagement with the support and having movement relative thereto and longitudinally of the rotating axis thereof.

3. In a leaf turner, the combination with a suction-member for engaging a leaf, of a rotary support for the suction-member and

reciprocating means for actuating the support, said means being in engagement with the support and having movement relative thereto and longitudinally of the rotating axis thereof.

4. In a leaf turner, the combination with a leaf-engaging member, of a rotary and longitudinally movable support for the leaf-engaging member, and a device in engagement with the support and having movement relative thereto and longitudinally of its rotating axis for effecting operation of the support.

5. In a leaf turner, the combination with a leaf-engaging member, of a rotary and longitudinally movable support for the leaf-engaging member, and reciprocating means for operating the latter, said means being in engagement with the support and having movement relative thereto and longitudinally of its rotating axis.

6. In a leaf turner, the combination with a suction-member for engaging a leaf, of a rotary support for the suction member, means connected with the suction member for exhausting air therefrom and a device in engagement with the support for actuating the latter, said device having movement relative thereto and longitudinally of the rotating axis of the support.

7. In a leaf turner, the combination with a suction-member for engaging a leaf, of a rotary support for the suction member, means connected with the suction member for exhausting air therefrom, and reciprocating means having engagement with the support for actuating the same, said means being movable relative thereto and longitudinally of the rotating axis of the support.

8. In a leaf turner, the combination with a suction-member for engaging a leaf, of a hollow rotary support for the suction member, and a device having engagement with the rotary support for exhausting air from the suction member and actuating the support.

9. In a leaf turner, the combination with a suction-member for engaging a leaf, of a hollow rotary support for the suction member and reciprocating means in engagement with the rotary support for exhausting air from the suction member and operating the support.

10. In a leaf turner, the combination with a suction-member for engaging a leaf, of a hollow rotary and longitudinally movable support for the suction member, and a device operatively connected with the rotary support for exhausting air from the suction member and operating the support, said device having engagement with the support.

11. In a leaf turner, the combination with a suction-member for engaging a leaf, of a hollow rotary and longitudinally movable

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support for the suction-member, and reciprocating means in engagement with the support for exhausting air from the suction-member and operating the support.

- 5 12. In a leaf turner, the combination with a suction-member for engaging a leaf, of a hollow rotary and longitudinally movable support for the suction-member, a piston carried by the support, a cylinder inclosing
10 the piston and movable thereon, a cam arranged longitudinally of the support for engaging a coöperating opening in the upper end of the cylinder, and tension devices for holding the cylinder normally raised and the
15 support normally lowered.

13. In a leaf turner, the combination with a suction-member for engaging a leaf, of a support for the suction-member, means in engagement with the support adapted to first rotate the same, and to raise the sup- 20 port at the limit of its rotating movement, and means for returning the support to normal position by successively rotating and lowering it.

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