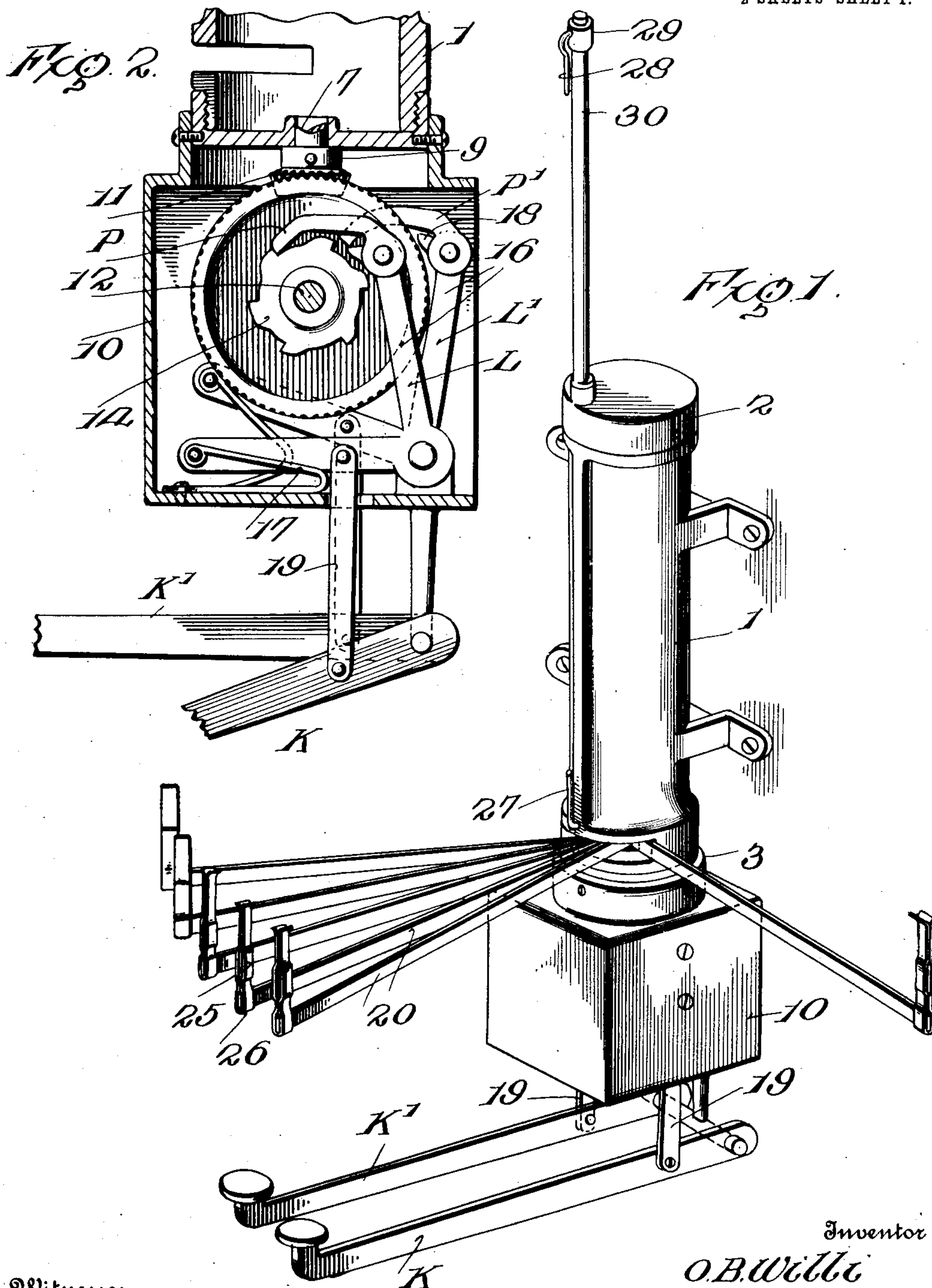


O. B. WILLI.
MUSIC LEAF TURNER.
APPLICATION FILED MAR. 11, 1910.

997,107.

Patented July 4, 1911.

2 SHEETS—SHEET 1.



Witnesses
O. B. Willi,
John M. Fallin,

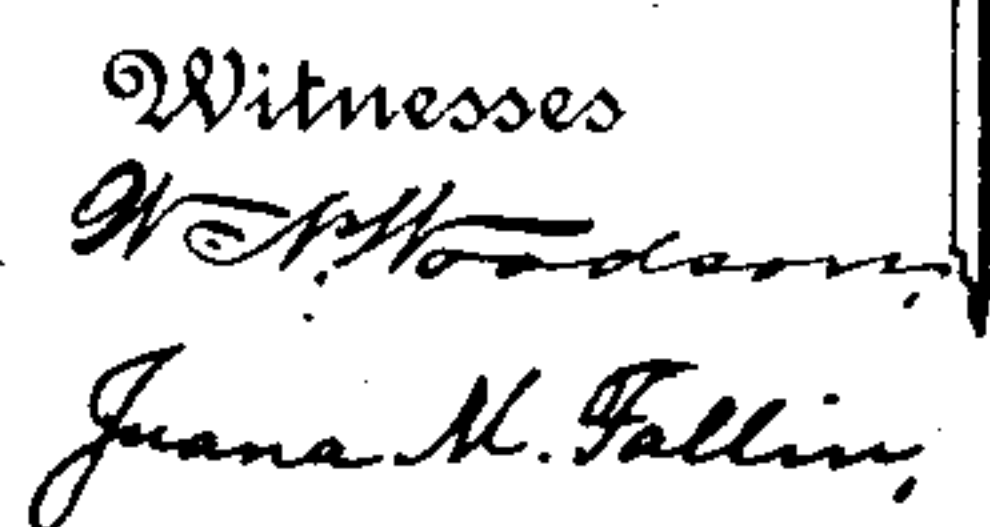
Inventor
O. B. Willi

By

John M. Fallin, Attorney,

997,107.

2 SHEETS-SHEET 2.

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H.A.R.A., Attorneys.

UNITED STATES PATENT OFFICE.

OTTO B. WILLI, OF YOUNGSTOWN, OHIO.

MUSIC-LEAF TURNER.

997,107.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed March 11, 1910. Serial No. 548,691.

To all whom it may concern:

Be it known that I, OTTO B. WILLI, citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Music-Leaf Turners, of which the following is a specification.

This invention comprehends certain new and useful improvements in apparatus for turning the leaves of musical compositions and the invention has for its primary object a simple and durable construction of music leaf turner, the parts of which are so arranged that the leaves will be at all times under perfect control so as to be turned to the right or to the left as desired, and the invention consists in certain constructions, arrangements and combinations of the parts that I shall hereafter fully describe and claim.

For a full understanding of the invention, reference is to be had to the following description and accompanying drawings, in which:

Figure 1 is a perspective view of a music leaf turner constructed in accordance with my invention; Fig. 2 is a transverse sectional view, the section being taken through the casing or housing or the actuating devices; Fig. 3 is a vertical longitudinal sectional view of the device; Fig. 4 is a horizontal section on the line 4—4 of Fig. 3; Fig. 5 is a side elevation of the lower portion of the arm actuating sleeve employed; Fig. 6 is a top plan view of a portion of the leaf turning arms; and, Fig. 7 is a detail sectional view of a part of the sleeve, the section being taken approximately on the line 7—7 of Fig. 5.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

My improved music leaf turner comprises a cylinder 1 which may be secured in any desired way to the music panel of a piano, organ or similar instrument, or mounted in any desired manner upon a music stand, said cylinder being provided at its upper end with a screw cap 2 and at its lower end with a corresponding cap 3. Intermediate of its ends and preferably nearer the upper end than the lower end, the cylinder 1 is formed on its interior with a screw threaded bearing 4 in which an actu-

ating sleeve 5 works. The sleeve 5 is exteriorly screw threaded and is mounted to move longitudinally upon and to turn with a shaft 6, said shaft in the present instance being formed with an upper square or non-circular portion and the actuating sleeve 5 being formed with a two-point bearing of corresponding shape. The lower portion of the shaft 6 is preferably round, as indicated at 7. The shaft 6 is provided at its upper end with a trunnion 8 journaled in a bearing in the upper screw cap 2, and the lower end of the shaft is held by set collars 9 in a bearing opening formed in the lower screw cap 3. The shaft extends downwardly below the screw cap 3 into a casing 10 which is secured in any desired way to said screw cap, and a bevel pinion 11 is secured to the lower extremity of the shaft. A transversely extending shaft 12 is journaled in the casing 10 and carries two loose bevel gear wheels 13 which mesh with the pinion 11 in diametrical relation thereto. Each gear wheel 13 is fast with a ratchet wheel, said ratchet wheels being designated 14 and 15, respectively, and each ratchet wheel being provided in the present instance with six teeth, although it is to be understood that the number of teeth may be varied, according to the ratio of gears to pinion.

A pawl P is designed for engagement with the ratchet wheel 14 and a pawl P' is designed for engagement with the ratchet wheel 15. These pawls are gravity push pawls in the present instance and are pivotally mounted on the upper ends of the vertically extending arms 16 of bell crank levers L and L', respectively. The relatively horizontally extending arm of the levers are pressed upon by springs 17, whereby the horizontally extending arms will normally be held in an upwardly inclined position with the pawls out of engagement with the teeth of the ratchet wheels 14 and 15. It will be noted that the upwardly projecting arm 16 of each bell crank lever is formed at its upper end with a lug 18 designed to engage the corresponding pawl and hold it in a relatively elevated position out of engagement with the ratchet wheels, whereby each ratchet wheel is free to move until the horizontally extending arm of its lever is depressed, whereupon the corresponding pawl will be lowered and carried into operative engagement with the teeth of the wheel.

It is to be understood that within the

purview of my invention any means may be employed to actuate the levers L and L'. In the present embodiment of the invention I have shown as said actuating means keys 5 K and K' that are respectively connected to the levers by link rods 19. These actuating keys K, K' may be located just above and back of the regular keys of the piano or other instrument equipped with the inven-
10 tion.

20 designates the leaf turning arms. Each of these is carried by a standard 21 which extends vertically within the cylinder 1, and which is provided with upper and 15 lower bearing rings 22 by which it is mounted to turn on the round lower portion 7 of the shaft 6. Each standard 21 is formed at its upper end above the upper bearing ring 22, with a laterally projecting lug 23. Preferably, each leaf turning arm with its 20 standard 21, bearing rings and lugs is constructed out of a single piece of sheet metal, stamped and shaped in the desired form. In the present illustration there are six of 25 these arms shown (although it is to be understood that any desired number may be used) and the standards are so arranged that the lugs 23 will bear a stepped relation to each other, one above the other, each lug 30 23 being higher than the lug next below it by a distance equal to one-half the pitch of the threads on the actuating sleeve 5. The said sleeve is formed at its lower end with actuating fingers 24, and these also are so 35 arranged that each finger is higher than the preceding one by a distance equal to one-half the pitch of the threads of the actuating sleeve. The vertical height of the individual fingers and the individual lugs is a 40 little less than one-half the pitch of the said threads, while the distance between the inside vertical faces of the fingers 24 is slightly greater than the thickness of the lugs 23. Manifestly, the leaf turning arms 45 20 are bent or deflected intermediate of their ends so that their outer ends will all lie in the same horizontal plane. Any desired construction of clip may be employed to secure the leaf to the arm. For example, 50 as illustrated best in Fig. 1, each arm carries a spring jaw clip 25 formed at its lower end with a loop 26 by which it is adapted to move longitudinally on one of the arms 20.

In connection with the leaf turning mechanism, any desired construction or arrangement of mechanism may be employed to hold the music book or the cover sheet of the musical composition upon the music shelf or panel of the instrument, and any 60 means may be employed to secure the sheet music or book to the leaf turning apparatus. For the purpose of illustration only, I have shown an arm 27 secured to the cylinder 1 near the lower end thereof, said arm being 65 designed to engage the lower edge of the

book or sheet music, and co-acting with a spring arm 28 designed to engage the upper edge of the book or the like. This upper arm 28 is secured to a sleeve 29 which is 70 mounted for vertical movement and frictionally held adjustment on a post 30 which is secured in any desired way to the upper screw cap 2 and which projects upwardly therefrom, as clearly illustrated in the drawing. 75

In describing the practical operation of my improved music leaf turner, it will be understood that in the normal or "at rest" position of the parts, both of the bell crank levers L, L' are held with their actuating or 80 depressing arms at the highest point of their movement. Thus the lugs 18 on the upwardly projecting arm 16 of the bell cranks hold the pawls P, P' just outside of the clearance circles of the ratchet wheels 14 85 and 15 so that said wheels may be turned in either direction. In Fig. 3, all but one of the leaf turning arms 20 are shown as having been turned around to the left. Now, for example, if the key K is depressed it is 90 pulled down to actuate the right hand bell crank L, the end of the pawl P will fall and engage a tooth on the ratchet wheel 14 so as to turn the actuating sleeve 5 from right to left. The full stroke of the pawl 95 P is secured so that it will turn the ratchet wheel 14 one-sixth of a revolution, and this consequently will turn the actuating sleeve 5 one-half of a revolution and swing the 100 leaf turning arm from right to left. Of course, the left hand ratchet wheel 15 turns in an opposite direction to that in which the right hand ratchet wheel 14 is turned, but the pawl P' of the ratchet wheel 15 does 105 not interfere, as it is held by its lug 18 in a relatively elevated position. As soon as the bell crank L is released, it assumes its original position and the relative positions of the pawls and the teeth of the ratchet 110 wheels are the same, although obviously the ratchet wheel 14 has been turned one tooth. It is clear that this movement can be repeated immediately so as to turn one arm after the 115 other from right to left or the movement may be reversed by merely pressing the left hand bell crank L. As shown in said Fig. 3, the highest finger 24 at the right of the view is close to the observer, while the lower 120 finger at the right is behind the lug 23 on the last arm in the series. As the actuating sleeve 5 is turned by the rotation of the shaft 6, the sleeve turning from right to left, it carries the lug 23 with it and also moves 125 downwardly so that for a small part of a revolution of the actuating sleeve, the said lug is held between the said fingers and may be stopped when only part way around and turned back by pressing the left hand bell 130 crank L. If the sleeve 5, however, is turned an entire half revolution from right to left

and the lug 23 of the said arm 20 reaches the left hand side, the highest finger on the sleeve is now behind the lug of the arm and said arm and the leaf it controls can immediately be turned to the right without a lost motion by pressing the left hand bell crank L. If, in the position shown, the left hand bell crank L be actuated, the sleeve 5 will be turned from left to the right. The highest finger 24 at the left is behind the lug 23 and will thus turn the lug and arm from left to right. It will thus be seen that the leaf is under control at all points and can be stopped when half way around or at any other point and immediately returned. Preferably, the sleeve 5 is provided at its upper end with a pin 31 designed to limit the downward movement of the sleeve.

Having thus described the invention, what is claimed as new is:

1. In a music leaf turner, comprising a cylinder having a threaded bearing portion, a sleeve mounted in said bearing portion provided with arms, a shaft extending through said sleeve, a plurality of leaf turning arms provided with lugs coacting with the arms of said sleeve, and means for actuating said shaft.

2. A music leaf turner, embodying an actuating sleeve, a bearing in which the sleeve is mounted for engagement, a shaft mounted in the sleeve, the sleeve being free to move longitudinally on the shaft but held to turn therewith and provided with spaced actuating fingers, means for turning said shaft, and a leaf turning arm mounted to swing on said shaft and provided with a lug designed for engagement by said fingers.

3. A music leaf turner, embodying a sleeve, a bearing in which the sleeve has a threaded engagement, a shaft on which the sleeve is mounted to move longitudinally but held to turn therewith, a support for said shaft, a leaf turning arm embodying a standard provided with bearings mounted on said shaft and with a lug, the sleeve being provided with spaced fingers designed for engagement with said lug.

4. A music leaf turner, embodying a cylinder, a shaft journaled therein, a sleeve mounted in the cylinder, the latter having a threaded bearing in which the sleeve works,

the shaft passing through the sleeve and the latter movable longitudinally on the shaft, but held to turn therewith, the sleeve being formed with spaced actuating fingers, means for turning the shaft, and a leaf turning arm embodying a standard having a lug for engagement by said fingers, said standard having a bearing on the shaft and movable therearound, whereby to permit the swinging of the arm.

5. A music leaf turner, embodying a cylinder, a shaft journaled therein and formed with an upper non-circular portion and a lower round portion, a sleeve formed with an opening corresponding to the upper portion of the shaft and mounted to move longitudinally thereon, the cylinder being formed with an interiorly threaded bearing in which the sleeve works, the sleeve being provided at its lower end with laterally spaced actuating fingers, means for turning the shaft, and a leaf turning arm provided with a standard mounted in the cylinder, the standard being mounted for rotation on the round lower portion of the shaft and being provided at its upper end with a lug designed for engagement by said fingers.

6. A music leaf turner, comprising a cylinder, a screw cap secured to the upper end of the cylinder, another screw cap secured to the lower end of the cylinder, a shaft journaled in said screw caps and projecting below the lower cap, a sleeve mounted for longitudinal movement on said shaft but held to turn therewith, the cylinder being formed with an interior screw threaded bearing in which the sleeve works, the sleeve being provided with laterally spaced actuating fingers, a leaf turning arm provided with a standard mounted within the cylinder and formed with bearings by which it is mounted to turn on the shaft, a lug formed on said standard, the shaft being provided at its lower projecting end with a pinion, and means engaging said pinion for turning the shaft.

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

OTTO B. WILLI. [L. s.]

Witnesses:

R. C. HUEY,
F. D. LODGE.