

No. 777,786.

PATENTED DEC. 20, 1904.

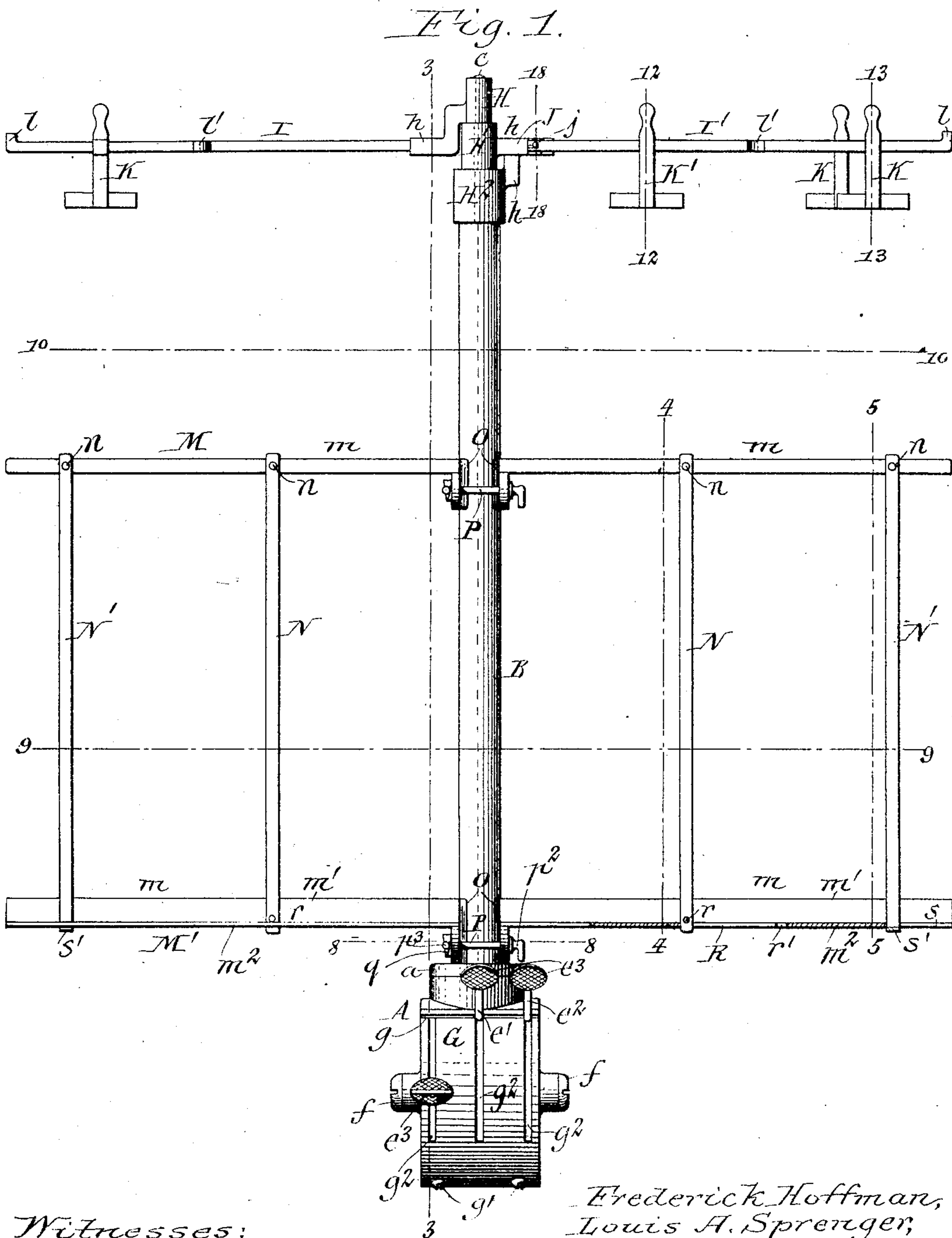
F. HOFFMAN, L. A. SPRENGER & J. J. WEBER.

LEAF TURNER.

APPLICATION FILED FEB. 27, 1904.

NO MODEL.

3 SHEETS—SHEET 1.



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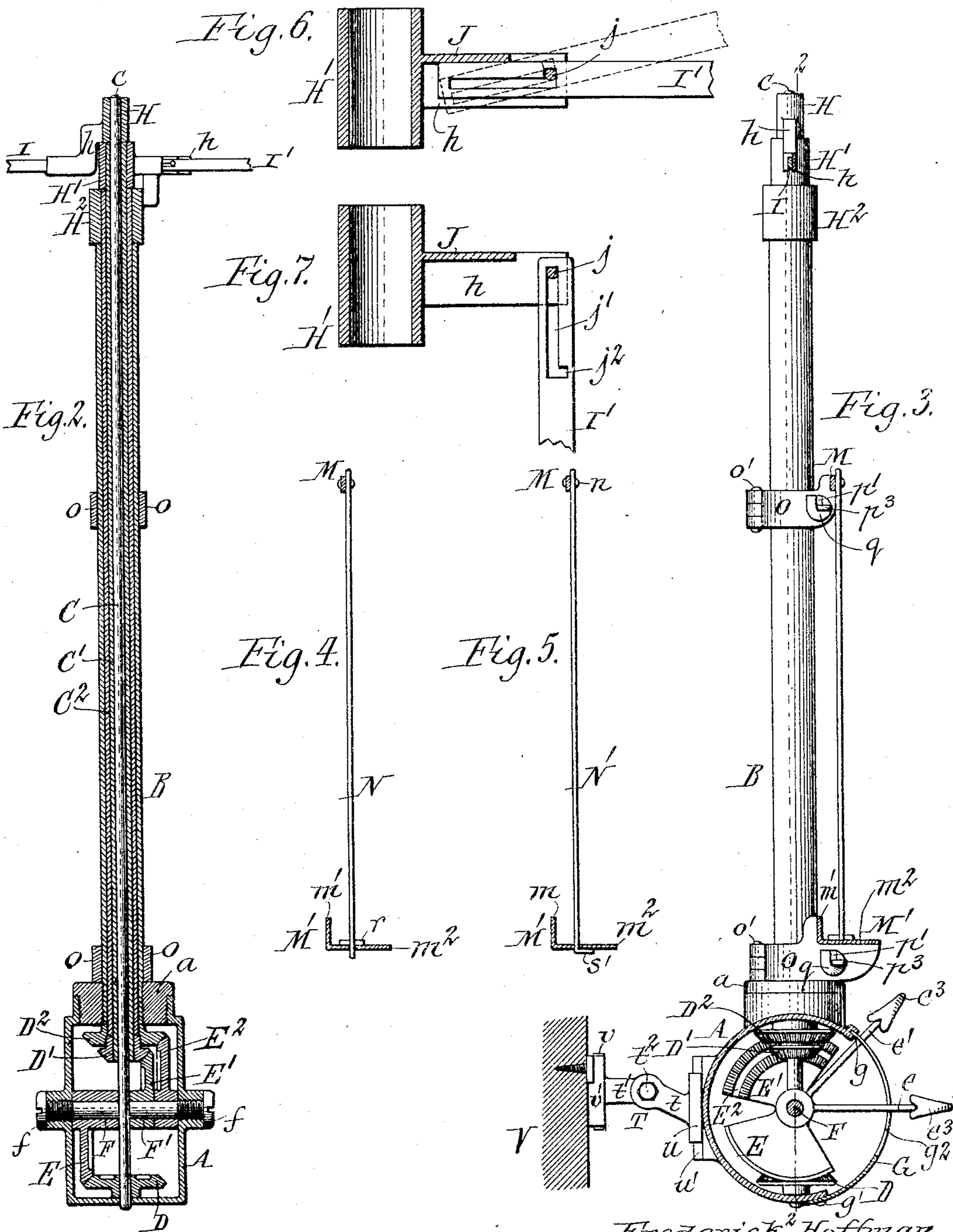
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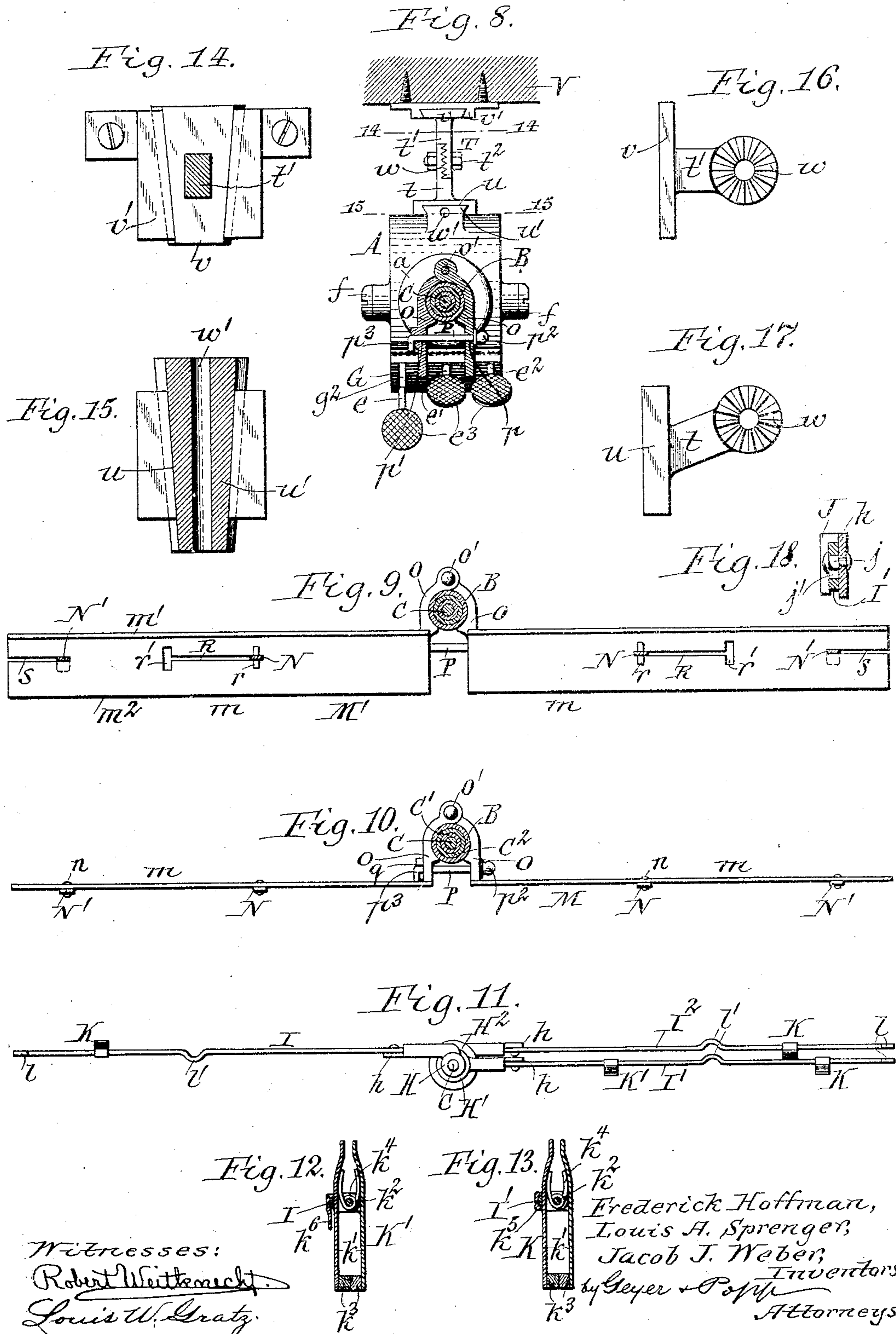
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APPLICATION FILED FEB. 27, 1904.

NO MODEL.

3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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BUFFALO, NEW YORK.

## LEAF-TURNER.

SPECIFICATION forming part of Letters Patent No. 777,786, dated December 20, 1904.

Application filed February 27, 1904. Serial No. 195,656.

*To all whom it may concern:*

Be it known that we, FREDERICK HOFFMAN, LOUIS A. SPRENGER, and JACOB J. WEBER, citizens of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Leaf-Turners, of which the following is a specification.

This invention relates to a leaf-turner which is more particularly designed for turning the leaves of sheet-music, but which may also be employed for turning the leaves of books or other sheets.

The object of this invention is to produce a leaf-turner of simple and durable construction which permits of turning the leaves quickly and conveniently either forward or backward and which can be compactly folded for transportation.

In the accompanying drawings, consisting of three sheets, Figure 1 is a front elevation of a leaf-turner embodying our improvements. Fig. 2 is a fragmentary longitudinal section taken in line 2 2, Fig. 3, showing the nested shafts for operating the leaf-shifting bars. Figs. 3, 4, and 5 are vertical sections in lines 3 3, 4 4, and 5 5, Fig. 1, respectively. Figs. 6 and 7 are fragmentary sectional views, on an enlarged scale, showing a shifting-bar in an operative and an inoperative position. Figs. 8, 9, and 10 are horizontal sections in lines 8 8, 9 9, and 10 10, Fig. 1, respectively. Fig. 11 is a top plan view of our improved leaf-turner. Figs. 12 and 13 are vertical sections in lines 12 12 and 13 13, Fig. 1, showing the two kinds of clasps which are employed for attaching the sheets to the shifting-bars. Figs. 14 and 15 are fragmentary vertical sections, on an enlarged scale, in lines 14 14 and 15 15, Fig. 8, respectively. Figs. 16 and 17 are detached elevations of the members of the bracket for adjustably supporting the leaf-turner. Fig. 18 is a vertical section, on an enlarged scale, in line 18 18, Fig. 1.

Similar letters of reference indicate corresponding parts throughout the several views.

A represents a hollow base or cylindrical casing, and B a hollow or tubular standard or post mounted on top of the base. The stand-

ard is preferably detachably connected with the base by means of a plug or head *a*, having an internal screw-thread which receives the lower screw-threaded end of the standard and an external screw-thread which engages with an internally-threaded opening in the top of the casing. Within the standard are arranged a plurality of nested shafts consisting, preferably, of an inner or central solid shaft C, an intermediate hollow shaft C', surrounding the central shaft, and an outer hollow shaft C'', surrounding the intermediate shaft and journaled in the standard. The several shafts vary in length, the outermost being the shortest, the intermediate shaft somewhat longer and projecting at its upper and lower ends beyond the corresponding ends of the outermost shaft, while the inner shaft is longest and projects at its opposite ends beyond the upper and lower ends of the intermediate shaft. The inner shaft is journaled at its lower end in a bearing in the bottom of the casing, as shown in Fig. 2.

At their upper ends the shafts are provided with means for supporting the leaves or sheets to be turned, and at their lower ends the same are provided with an actuating mechanism, whereby the shafts may be operated for turning the leaves either forward or backward. The preferred actuating means for this purpose (shown in the drawings) is constructed as follows: D D' D'' represent bevel gear-pinions secured to the lower ends of the shafts within the casing, the pinion D being secured to the inner shaft adjacent to the bottom of the casing and facing upwardly, while the pinions D' D'' are secured, respectively, to the intermediate and outer shafts adjacent to the top of the casing and face downwardly. E E' E'' represent gear-segments which mesh with the pinions D D' D'' and whereby the shafts and the parts connected therewith are operated. The segment E meshes with the pinion D and is arranged in the casing on one side of the shafts, and the segments E' E'' mesh with the pinions D' D'', respectively, and are arranged in the casing on the opposite side of the shafts. F represents an arbor upon which the central segment is journaled, and F' an ar-

bor upon which the intermediate and outer segments are journaled. These arbors are horizontally in line between the upper and lower gear-pinions and preferably abut at their inner ends against opposite sides of the central shaft, while their outer ends are screw-threaded and engage with threaded openings in the side walls of the casing, as shown in Fig. 2. The hub of the segment E is of such length that it fills the space between the central shaft and the adjacent side wall of the casing, while the combined length of the hubs of the segments E' E<sup>2</sup> fills the space between the opposite side of the central shaft and the adjacent side wall of the casing, thereby confining the segments in their proper working position without requiring any special means for this purpose. The outer ends of the arbors are preferably provided with slotted heads *f*, as shown, to permit of turning the same by means of a screw-driver, these heads also serving as stops to limit the inward movement of the arbors. *e e' e<sup>2</sup>* represent a series of narrow keys which project forwardly from the segments E E' E<sup>2</sup> through the casing and by which the shafts and connecting parts are turned. These keys are preferably provided at their outer ends with enlargements or finger-pieces *e<sup>3</sup>*, which are preferably formed integrally with the keys and suitably knurled or roughened for convenience in manipulating the same. In assembling the parts the shafts, with the gear-pinions mounted thereon, are introduced through the top opening of the casing, which is normally closed by the plug *a*, which opening is made sufficiently large for this purpose. The segments are introduced into the casing through an opening in the front side thereof. This opening is normally closed by a cover G, which is curved to fit the cylindrical form of the casing and fits at its upper edge into a transverse groove *g* in the casing, while its lower end is secured to the casing by screws *g'*. The central part of the cover is provided with three circumferential slots *g<sup>2</sup>*, through which the keys of the finger-pieces project and in which the same move up and down in shifting the segments. The slots *g<sup>2</sup>* extend to the upper edge of the cover, so as to permit the same to be passed over the narrow body of the keys in rear of the finger-pieces after the latter and the segments have been assembled in the casing.

Each shaft is provided with means for supporting a leaf at its upper edge, which means are preferably constructed as follows: H H' H<sup>2</sup> represent sleeves mounted one above the other on the upper ends of the shafts C C' C<sup>2</sup>, respectively, and each provided with a laterally-projecting arm *h*. I I' I<sup>2</sup> represent shifting-bars, each of which is connected at its inner end with one of the arms *h* by a pivotal joint, which is constructed to hold the bar either in a horizontal operative position or in a vertical inoperative position. This joint

preferably consists of a flange J, arranged on the inner front part of the arm and adapted to overhang and to embrace the inner end of the shifting-bar, a headed pin *j*, arranged on the front side of the arm at a distance from the flange, and an L-shaped slot formed in the inner end of the shifting-bar and receiving the pin *j*, said slot consisting of a long horizontal or main portion *j'* and a transverse notch or short portion *j<sup>2</sup>*, extending upwardly from the outer end of the main portion. In the operative position of the shifting-bar its inner end extends underneath the flange, which forms a shoulder thereon and rests with its notch on the pin, as shown in Fig. 6. While the bar is in this position the same is held against longitudinal movement relatively to its arm and is in condition for use. When it is desired to fold the bar together with other parts of the leaf-turner for producing a compact parcel which can be carried conveniently, the shifting-bar is first raised at its outer end sufficiently to disengage its notch from the pin, as shown by dotted lines in Fig. 6. The bar is now moved outward lengthwise until its inner end is withdrawn from underneath the flange, for which purpose the slot extends inwardly a sufficient extent. When this has been done, the bar is free to be swung downwardly into a pendent position parallel with the standard, as shown in Fig. 7, thereby reducing the spread of the leaf-turner considerably.

For the sake of improving the appearance of the leaf-turner the several leaf-shifting bars are arranged to swing in the same plane, which is preferably accomplished by deflecting the uppermost arm downwardly and the lowermost arm upwardly into line with the central arm, as shown in Figs. 1 and 2.

On its outer part each of the shifting-bars is provided with a permanently-connected leaf clasp or clip K for attaching the outer part of a leaf or sheet to the bar. Although this clasp may be variously constructed, the same comprises, preferably, two levers *k' k'*, which are pivotally connected about midway by a pintle *k<sup>2</sup>*, passing through suitable ears on the levers, gripper-jaws *k<sup>3</sup>*, of felt, arranged on the opposing lower ends of the levers, a spring *k<sup>4</sup>*, applied to the pivot and operating to normally press the jaws together, and a strap or loop *k<sup>5</sup>*, arranged on the rear jaw *k'* and receiving the shifting-bar, as shown in Fig. 13. The leaf to be turned is gripped between the jaws *k<sup>3</sup>*, which latter are separated to permit of placing the leaf between them by first pressing together the upper ends of the levers in a manner common to this type of clasps. By sliding the clasp lengthwise on the shifting-bar the same may be adjusted to suit leaves of different widths. In order to confine the clasp K on the outer part of the shifting-bar and prevent removal of the clasp therefrom, the bar is provided with outer and inner stops

7  $l l'$ , arranged on opposite sides of the clasp. The outer stop  $l$  is formed by bending up the outer end of the bar, as shown in Fig. 1, while the inner stop  $l'$  is formed by forming a short lateral bend or deflection in the central part of the bar, as shown in Fig. 11.

10 When the leaf-turner is employed for turning sheet-music which is composed wholly of folios, it is only necessary to attach the sheets at the top near their outer ends to the shifter-bars by means of the clasps  $K$  for turning the leaves; but when the book or piece of music contains single leaves which are free at the outer and inner edges it is necessary to  
15 attach the same at its inner end to the shifting-bar in addition to being attached thereto at its outer end. For this purpose detachable auxiliary leaf clasps or clips  $K'$  are employed, which are constructed like the outer  
20 clasps  $K$ , with the exception that a depending hook  $h^6$  is substituted for the loop  $h^5$ , as shown in Figs. 1 and 12. When an auxiliary clasp is required, its hook is sprung over the inner part of the shifting-bar, between the inner  
25 stop and the hinge thereof, and the top edge of the sheet or leaf is gripped near its inner end by the auxiliary clasp. By this means either folios or detached individual leaves can be turned by this apparatus with equal facility. When the book or piece of music has  
30 no loose or single leaves, the auxiliary clasps may be removed.

35 The body of the book or leaves of sheet-music are supported from the standard by a rack, which is preferably constructed as follows:  $M M'$  represent the upper and lower horizontal bars of the rack, and  $N N'$  the vertical rails thereof. Each of the horizontal bars is preferably so constructed and connected with the standard that the same can be detached from the standard and folded compactly. For this purpose each horizontal bar  
40 is divided centrally into two sections  $m m$ , and their inner ends are provided with opposing clamping-jaws  $O O$ , which engage against opposite sides of the standard. The jaws are permanently connected in rear of the standard by a vertical pintle  $o'$ , while their front ends are detachably connected by a horizontal coupling-bolt  $P$ , which is seated at one  
45 end in a circular perforation or opening  $p$  in one clamping-jaw, while its opposite end is seated in a slot  $p'$  in the companion jaw. The bolt is provided at one end with an enlarged  
50 head or handle  $p^2$ , which bears against the outer side of the jaw having the opening  $p$ , and its opposite end is provided with a laterally-projecting lug  $p^3$ , which bears against the outer side of the jaw having the slot. In assembling the parts the members of each rack-bar are first straightened and their jaws engaged with opposite sides of the standard. The bolt is next passed, with its lug, through the slotted jaw and then turned, so that the  
65 lug is out of register with the slot and bears

against the outer side of the slotted lug on one side of its slot, thereby attaching the rack-bar in an unfolded condition to the standard. In order to insure a firm grip of the clamping-jaws on the standard, the outer side of the  
70 slotted jaw is provided around its slot with a spiral incline or cam-face  $q$ , with which the lug engages upon being turned, as shown in Figs. 1, 3, and 8, and whereby the jaws are drawn together for securely fastening the  
75 same and the parts connected therewith on the standard. Upon turning the bolt backwardly until its lug is in line with the slot of the adjacent jaw the two jaws can be separated and the members of the bar can be detached from  
80 the standard and folded. Each member or section of the lower rack-bar is preferably L-shaped, so as to form a horizontal shelf  $m^2$  for supporting the leaves at their lower edges and a vertical back  $m'$ , which prevents the  
85 leaves from sliding backwardly off the shelf. The members or sections of the upper rack-bar are plain and merely serve as a back-support for the books or leaves.

90 A pair of vertical rails  $N N'$  is arranged on each side of the standard and connect the inner and outer parts of the horizontal rack-bar members on the same side of the standard. Each of the rack-rails is preferably pivoted by a pin  $n$  or otherwise to an upper rack-  
95 bar section. The lower end of each inner rail  $N$  projects downwardly through a longitudinal slot  $R$  in the inner part of the shelf of a lower rack-bar and is provided with a shoulder or cross-pin  $r$ , which bears against the  
100 top of the shelf on opposite sides of the slot, as shown in Figs. 1, 4, and 9. The outer rail  $N'$  projects downwardly through a longitudinal slot  $s$  in the outer part of the shelf and is provided with a shoulder or laterally-projecting  
105 lip  $s'$  at its lower end, which bears against the under side of the shelf, as shown in Figs. 1, 5, and 9. The outer slots  $s$  extend to the outer end of the lower bar-sections, so as to permit of freely swinging the outer rails into  
110 and out of said slots. In assembling the parts of the rack the lower rack-bar is first applied to the standard immediately above the gear-casing, the lower ends of the rails are engaged with the lower rack-bar, and the upper  
115 rack-bar is then clamped to the standard. By thus causing the shoulders of the outer rails to bear against the under side of the lower bar and the shoulders of the inner rails to bear against the upper side thereof a substantial connection is produced between the lower  
120 bar and the rails, whereby the same are firmly held against vertical displacement relatively to each other, while at the same time permitting of readily adjusting the same or dismantling the same for packing. When it is desired to adapt the rack for a book or for sheet-music which is shorter than usual, the shelf may be raised sufficiently so as to support the book or sheets with their upper edges  
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within reach of the clasps. When the shelf is thus raised, the same slides on the lower ends of the rails and the latter project with their inoperative portions below the shelf.

5 Inasmuch as the lips of the outer rails are arranged below the shelf they offer no obstruction to the upward movement of the shelf. The cross-pins at the lower ends of the inner rails would, however, prevent the shelf from

10 rising when they are in their normal position above the shelf. For the purpose of permitting the shelf to be raised the outer ends of the slots R are provided with enlargements  $r'$  of sufficient width to permit the passage

15 of the pins  $r$ . Preparatory to raising the shelf the inner rails are swung outwardly at their lower ends until their pins are in line with the enlargements  $r'$  of the slots. Upon now raising the shelf the pins  $r$  pass through

20 the enlargements, and thereafter the lower ends of the inner rails may be again swung inwardly, so that their cross-pins are underneath the shelf.

If desired, both the upper and lower horizontal bars of the rack may be adjusted vertically on the standard to suit different heights of books or sheets. In folding the upper horizontal bar of the rack the rails are turned on their pivots so that they are parallel with

30 the bars and form a more compact parcel.

The leaf-turner may be supported in any suitable manner, but preferably by the means shown in the drawings, which are constructed as follows: T represents a jointed bracket

35 composed of two links or members  $t$   $t'$ , which are pivotally connected by a horizontal clamping-bolt  $t^2$ . The front link  $t$  is provided with a downwardly-tapering dovetail socket  $u$ , which receives a correspondingly-shaped lug

40  $u'$  on the rear side of the gear-casing. The rear link  $t'$  is provided on its rear end with a downwardly-tapering wedge or dovetail lug  $v$ , which fits into a similar stationary socket  $v'$ , secured to the front of a piano, organ, or

45 other suitable support V. By turning the front link on the rear link the leaf-turner may be adjusted so as to incline at different angles to suit the person using the same. For the purpose of more securely holding the

50 links in their relatively adjusted position the opposing annular faces around the clamping-bolt  $t^2$  are provided with cooperating teeth  $w$ , as shown in Figs. 8, 16, and 17.

Instead of making the leaf-turner adjustable as to inclination the same may be held

55 rigid, in which case the bracket-links are dispensed with and the dovetail lug of the gear-casing may be engaged directly with the stationary socket  $v'$ . The lug on the gear-casing is provided with a vertical opening  $w'$ , which is intended to receive a vertical pin at the upper end of a portable music-stand or similar support.

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In the use of this leaf-turner the leaves

while resting on the rack are attached individually at their upper edges by means of the clasps to the several shifting-bars, which latter are then all turned backward so that the front page faces forward, in which position of the shifting-bars the finger-pieces and the

65 keys  $e$   $e'$   $e^2$  all project upwardly. When the first page of the book or piece of music has been read, the first finger-piece and key  $e$  are depressed, thereby causing the first shifter-bar I to swing from right to left and turn the

70 first leaf. This operation is repeated for each of the succeeding leaves, the second leaf being turned forwardly upon depressing the second key  $e'$ , and the third leaf being turned upon depressing the third key  $e^2$ . If it is

80 necessary to repeat any of the music or reading matter, any one or all of the leaves can be reversed or turned back from left to right by raising the keys controlling the particular

85 leaves.

When it is desired to transport the leaf-turner, the same can be readily dismembered and folded compactly in the manner previously described with reference to the several

90 parts of the leaf-turner.

Our improved leaf-turner contains but few parts, is not liable to get out of order, and is neat in appearance, rendering the same well-suited for permanent attachment to pianos or other musical instruments.

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We claim as our invention—

1. A leaf-turner comprising a hollow standard, a plurality of nested shafts arranged in said standard and each projecting at its ends beyond the ends of the shaft surrounding the

100 same, means for attaching leaves to the upper ends of said shafts, an upwardly-facing pinion secured to the central shaft, downwardly-facing pinions secured to the other shafts, and segments meshing with said pinions, substantially as set forth.

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2. A leaf-turner comprising a casing having an opening in its top, a plug fitting in said opening, a hollow standard fitting in said plug, a shaft journaled in said standard, means for

110 connecting a leaf with the upper end of said shaft, a pinion secured to the lower end of said shaft and constructed to pass through said opening, and a segment meshing with said pinion, substantially as set forth.

115

3. A leaf-turner comprising a casing, a hollow standard mounted on the casing, a plurality of nested shafts arranged in the standard the central one of which extends to the bottom of the casing while the others terminate near the top of the casing, means for

120 connecting leaves with the upper ends of said shafts, a pinion secured to the central shaft at the bottom of the casing, pinions secured to the other shafts at the top of the casing, arbors arranged on the casing on opposite

125 sides of the central shaft, a segment mounted on one of said arbors and meshing with the

lower pinion, and segments mounted on the other arbor and meshing with the upper pinions, substantially as set forth.

4. A leaf-turner comprising a casing, a hollow standard mounted on the casing, a plurality of nested shafts arranged in the standard the central one of which extends to the bottom of the casing while the others terminate near the top of the casing, means for connecting leaves with the upper ends of said shafts, a pinion secured to the central shaft at the bottom of the casing, pinions secured to the other shafts at the top of the casing, arbors arranged on opposite sides of the central shaft and each having a screw connection at its outer end with the adjacent wall of the casing, a segment mounted on one of the arbors and meshing with the lower pinion, and segments mounted on the other arbor and meshing with the upper pinions, substantially as set forth.

5. A leaf-turner comprising a casing having an opening in its front side, a hollow standard mounted on the casing, a plurality of nested shafts arranged in the standard, means for connecting leaves with the upper ends of said shafts, pinions secured to the lower ends of said shafts within the casing, segments meshing with said pinions, keys connected with said segments and projecting outwardly through the opening in the casing, and a cover for said opening provided with slots which receive the keys, substantially as set forth.

6. A leaf-turner comprising a cylindrical casing having an opening in its front side and a transverse groove at one end of said opening, a hollow standard mounted on the casing, a plurality of nested shafts arranged in the standard, means for connecting leaves with the upper ends of said shafts, pinions connected with the lower ends of said shafts within the casing, segments journaled in the casing and meshing with the pinions, keys connected with the segments and projecting outwardly

through said opening, finger-pieces or enlargements at the outer ends of said keys, a curved cover for closing said opening having slots which receive said keys and seated at one end in said groove, and a fastening for connecting the opposite end of the cover with the casing, substantially as set forth.

7. A leaf-turner comprising a vertical shaft, a horizontal shifting-arm connected at its inner end with the shaft and provided at its outer end and at its central part with stops, and a leaf-clasp provided with a loop mounted on said bar between said stops, substantially as set forth.

8. A leaf-turner comprising a vertical shaft, a horizontal shifting-arm connected at its inner end with the shaft and provided at its outer end with an upturned stop and at its central part with a laterally-deflected stop, and a leaf-clasp provided with a loop mounted on the bar between its stops, substantially as set forth.

9. A leaf-turner comprising a vertical shaft, a horizontal shifting-arm connected at its inner end with the shaft, an outer leaf-clasp permanently attached to the outer part of said bar, and an inner leaf-clasp detachably connected with the inner part of said bar, substantially as set forth.

10. A leaf-turner comprising a vertical shaft, a horizontal shifting-arm connected at its inner end with the shaft, an outer leaf-clasp provided with a loop which receives the outer part of said bar, and an inner leaf-clasp provided with a hook engaging with the inner part of said bar, substantially as set forth.

Witness our hands this 25th day of February, 1904.

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