D. J. FERRY.
Leaf Turner.

No. 197,025. Patented Nov. 13, 1877.

FIG. 1.

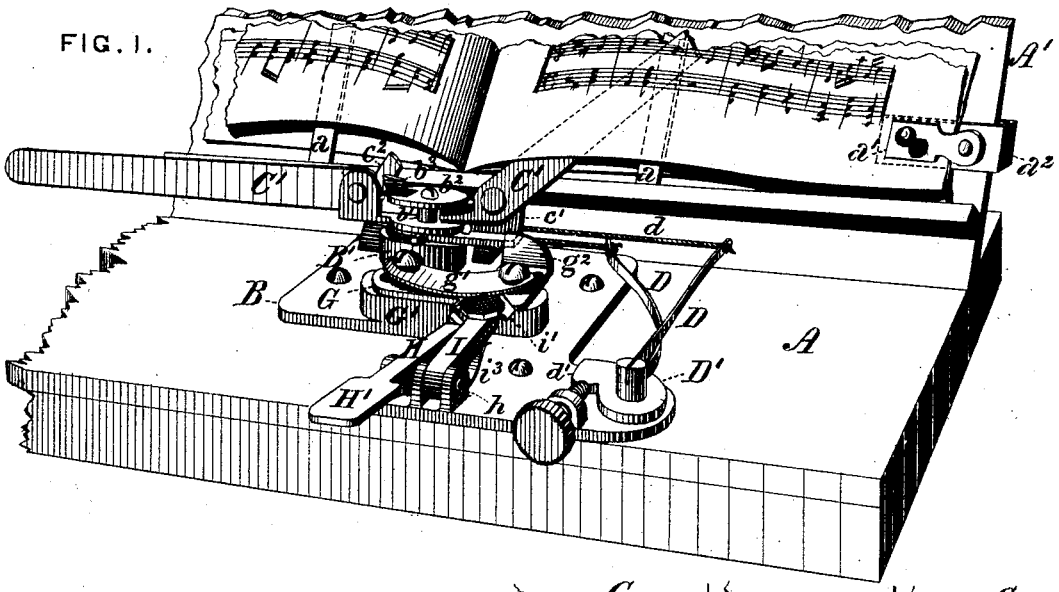


FIG. 3.

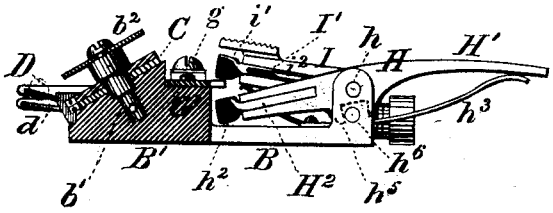


FIG. 5.

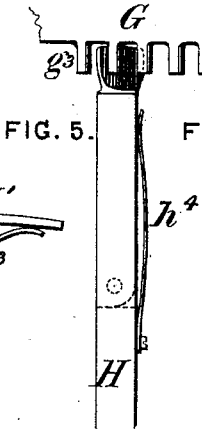


FIG. 6.

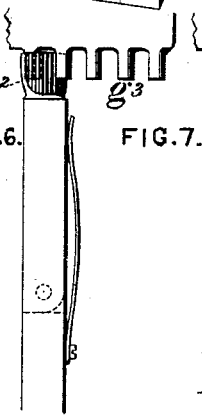


FIG. 7.

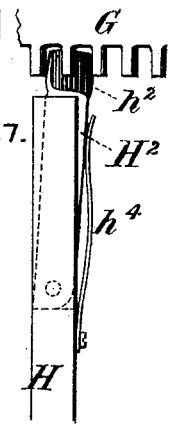


FIG. 2.

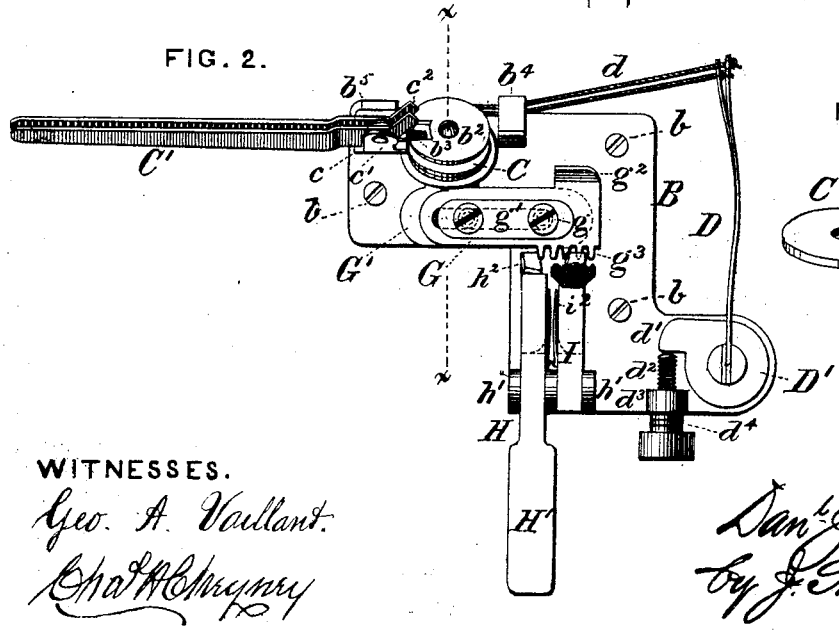
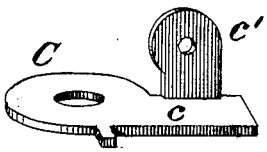


FIG. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

DANIEL J. FERRY, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN I. ROGERS, OF SAME PLACE.

IMPROVEMENT IN LEAF-TURNERS.

Specification forming part of Letters Patent No. **197,025**, dated November 13, 1877; application filed October 11, 1877.

To all whom it may concern:

Be it known that I, DANIEL J. FERRY, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Leaf-Turners, of which the following is a specification:

The object of my invention is to provide a simple and efficient device for turning the leaves of books, more particularly music-books, in such manner as to prevent interruption or inconvenience to the performer; to which end my improvements consist in the combination of a series of turning-fingers, each separately pivoted to an oscillating or vibrating base-piece, a series of springs by which motion is separately imparted to each base-piece and its attached finger, and mechanism for setting and retaining the base-pieces and fingers in position for operation, and separately and consecutively actuating each base-piece and finger at any desired intervals, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a view in perspective of my improved leaf-turner as attached to a book or music-stand; Fig. 2, a plan or top view of the same; Fig. 3, a section through the bed-plate to which the mechanism is attached at the line *x x* of Fig. 2; Fig. 4, a view in perspective, and on an enlarged scale, of one of the base-pieces detached; and Figs. 5, 6, and 7, views showing the retaining-bar and its operating-lever in different positions.

The frame or case A, to which the operating mechanism is attached, constitutes a book or music stand, which may be placed upon a piano or in any other convenient position relatively to the performer. An inclined rest or support, A′, for the book is provided at the upper and rear portion of the frame A; and for the purpose of holding sheet or pamphlet music two spring-clamps, *a a*, are attached by their lower ends to the rest A′, their upper ends being free so that the sheets may be slipped beneath and held by them. A separator, designed to prevent the turning of more than one leaf at a time, is attached to the right-hand side of the rest A′. This separator consists of a light plate-spring, a^1, the outer end of which is pivoted to a plate, a^2, secured upon the rest A′, preferably by a slot and set-screw, so as to be adjustable thereon. The plate-spring a^1 can be turned on its pivot so as to enable the music to be placed in position, and then turned down upon the leaves, as shown in Fig. 1, in which position it presses lightly upon the leaves, and acts to prevent the turning-fingers, hereinafter to be described, from moving more than one at a time.

The mechanism for turning the leaves is attached to and supported by a bed-plate, B, secured by screws *b* to the top of the case or frame A. A rearwardly-inclined boss or hub, B′, is secured upon the bed-plate B, and has a bearing-pin, b^1, secured centrally to and projecting upward from it. A series of base-pieces, C, each of which is substantially circular and provided with an arm or dog, *c*, on which is formed an upwardly-projecting lug, c^1, are mounted loosely upon the bearing-pin, so as to be vibrated freely thereon, as presently to be described, and a turning-finger, C′, preferably formed of light sheet metal, is pivoted to each of the base-pieces C by a pin or bolt passing through its lug c^1. A cap-plate, b^2, is secured upon the top of the bearing-pin b^1, a recess being formed on one side of the plate, with an upturned wing or flange, b^3, on its front side. A toe, c^2, is formed upon each of the fingers C′, below its point of attachment to the base-piece, said toes fitting beneath the cap-plate b^2, and serving to maintain the fingers in an upwardly-inclined position, most desirable for turning the leaves, until the base has been vibrated one-half a revolution, when, the toes being below the recess of the cap-plate, they are no longer held by the plate, and the fingers fall by their own gravity upon the case A, so as not to impede the view of the page just turned. The wing b^3 of the recess in the cap-plate prevents the displacement of the fingers when down, and prevents them from being reset without previously turning their toes under the cap-plate.

Each base-piece, with its pivoted turning-finger, is vibrated to turn a leaf by one of a series of springs, D, the resilience of which is transmitted to the base-pieces, and acts thereon through cords or flexible straps *d*, each of which is connected at one end to one of the springs D, and at the other to one of the base-pieces C, which it encircles for half its circum-

ference or thereabout when the spring is set ready for operation. In this instance plate-springs are employed, although springs of different construction could be substituted, if preferred. The springs D are secured to a cam, D′, pivoted on a stud in the bed-plate B, and having a dog or projection, d^1, which bears against the end of a set-screw, d^2, having a milled head, and engaging a nut, d^3, on the bed-plate. The tension of the springs D may be increased or diminished as desired by movement of the set-screw, the traverse of which can be regulated by the insertion or removal of loose washers d^4 between its head and nut. The cords or straps d pass through and are guided by a lug, b^4, which serves also as a stop for the base-pieces when set for operation. A lug, b^5, on the opposite side of the bearing-pin, arrests the base-pieces at the opposite extremity of their traverse.

The mechanism for setting and holding the base-pieces and fingers in position is as follows: A horizontal retaining-bar, G, is mounted on a pedestal, G′, on the bed-plate B, in front of the boss B′ of the bearing-pin, and has the capacity of longitudinal motion upon said pedestal, being guided thereon by two screws, g, passing through a longitudinal slot in the bar G, and engaging nuts formed in the pedestal. The bar G is pressed up to the face of the pedestal by a plate-spring, g^1, the tension of which can be regulated by the screws g. The object of this spring is to oppose greater resistance to the movement of the bar than can be overcome by the springs of the setting and releasing levers, to be presently described, so that the pawls of said levers may be moved by the bar against the tension of the springs last named. A flange, g^2, is formed upon the end of the bar G, adjacent to the springs D, extending upwardly and rearwardly at substantially the same angle as the bearing-pin on which the base-pieces are mounted. The length and location of the flange g^2 relatively to the base-pieces C are such that when the latter are set for operation the flange g^2 bears against the arms c of the base-pieces, and locks the latter in position. The retaining-bar is moved, so as to allow each finger to be separately actuated by its spring, by means of a releasing-lever, H, journaled loosely upon a pin, h, secured in lugs h^1 on the bed-plate, and having at one end a thumb piece or key, H^1, and at the other a pivoted pawl, H^2. The pawl H^2 works in a slot in the releasing-lever, and has at its free end an inclined toe, h^2, which engages teeth g^3 formed on the front of the retaining-bar G, each upward movement of the pawl end of the lever H serving to move the bar G longitudinally upon its pedestal for a sufficient distance to release one and no more of the base-pieces, and thereby to permit the same to be vibrated by its spring. The pawl end of the lever H is thrown down after each operation by a spring, h^3, acting upon the opposite end of the lever, the inclined toe h^2 of the pivoted pawl H^2 sliding in its descent past the tooth of the bar G, upon which it is next to operate, and being forced into position to act upon said tooth at its next upward movement by a spring, h^4, secured at one end to the lever H^2, and bearing at the other end upon the pawl. The degree of traverse of the lever H is limited by pins or projections h^5 on its under side, which strike a fixed pin, h^6, when the lever is at the extremities of its upward and downward movement. The bar G is moved in the reverse direction, and into position to lock one or more of the base-pieces for operation, as may be desired, by a setting-lever, I, journaled upon the pin h, which carries the releasing-lever, and provided with a similar pivoted pawl, I′, having an inclined toe, i^1, and pawl-spring i^2. Inasmuch as the setting-lever imparts a movement to the bar G in contrary direction to that imparted by the lever H, the pawl-spring i^2 of the lever I acts in reverse direction to the corresponding spring of the lever H, and a spring, i^3, beneath the lever I, throws its outer end upward after each operation, so as to stand above the bar G, instead of moving it downward and below said bar, as is the case with the lever H.

In the operation of my improvements the fingers are turned up and inserted between the leaves, as shown in Fig. 1, and the base-pieces locked by imparting as many movements to the retaining-bar G, by means of the setting-lever I, as there are fingers to be turned. The springs D being then in a state of tension, at each depression of the key H^1 of the releasing-lever H, at any desired intervals, one of the leaves will be turned over, and the operating-finger will drop below and entirely clear of the pages exposed, the operations being similar and continuous, at the volition of the performer, until all the fingers have performed their function. The releasing-lever may be readily connected to a pedal, so as to be worked by the foot, if desired.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, in a leaf-turner, of a stationary bearing-pin, a series of base-pieces journaled and vibrating thereon, a series of springs by which the base-pieces are independently vibrated, a series of turning-fingers, each of which is hinged or pivoted to one of the base-pieces, and a device by which the fingers are maintained in an upwardly-inclined position during operation, and released and depressed to a horizontal position thereafter, substantially as set forth.

2. The combination, in a leaf-turner, of a stationary bearing-pin, a series of base-pieces journaled upon and vibrating thereon, each carrying a pivoted turning-finger provided with a toe or projection below its point of attachment with the base-piece, and a cap-plate having a recess at one side and secured upon the bearing-pin above the toes of the turning-fingers, so as to maintain the fingers in an upwardly-inclined position during the period of

their vibration and permit of their depression thereafter, substantially as set forth.

3. The combination, in a leaf-turner, of a stationary bearing-pin, a series of base-pieces journaled thereon, each carrying a pivoted turning-finger, a series of springs by which the base-pieces and fingers are independently vibrated, a retaining-bar, substantially as described, by which one or all of the base-pieces are locked in position, and a releasing-lever actuating the retaining-bar to independently release the base-pieces, as set forth.

4. The combination of the retaining-bar, the releasing-lever, and the setting-lever, substantially as set forth.

5. The combination, with the series of vibrating base-pieces, of a sliding retaining-bar having on one side a series of teeth, and a releasing-lever having a pivoted pawl, which alternately moves the retaining-bar by engaging one of its teeth, and afterward is forced by a spring into position for engaging the adjacent tooth, substantially as set forth.

6. The combination, with the sliding retaining-bar and its side teeth, of the releasing-lever, the pivoted pawl having an inclined toe, and the pawl-spring, substantially as set forth.

DANIEL J. FERRY.

Witnesses:
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