

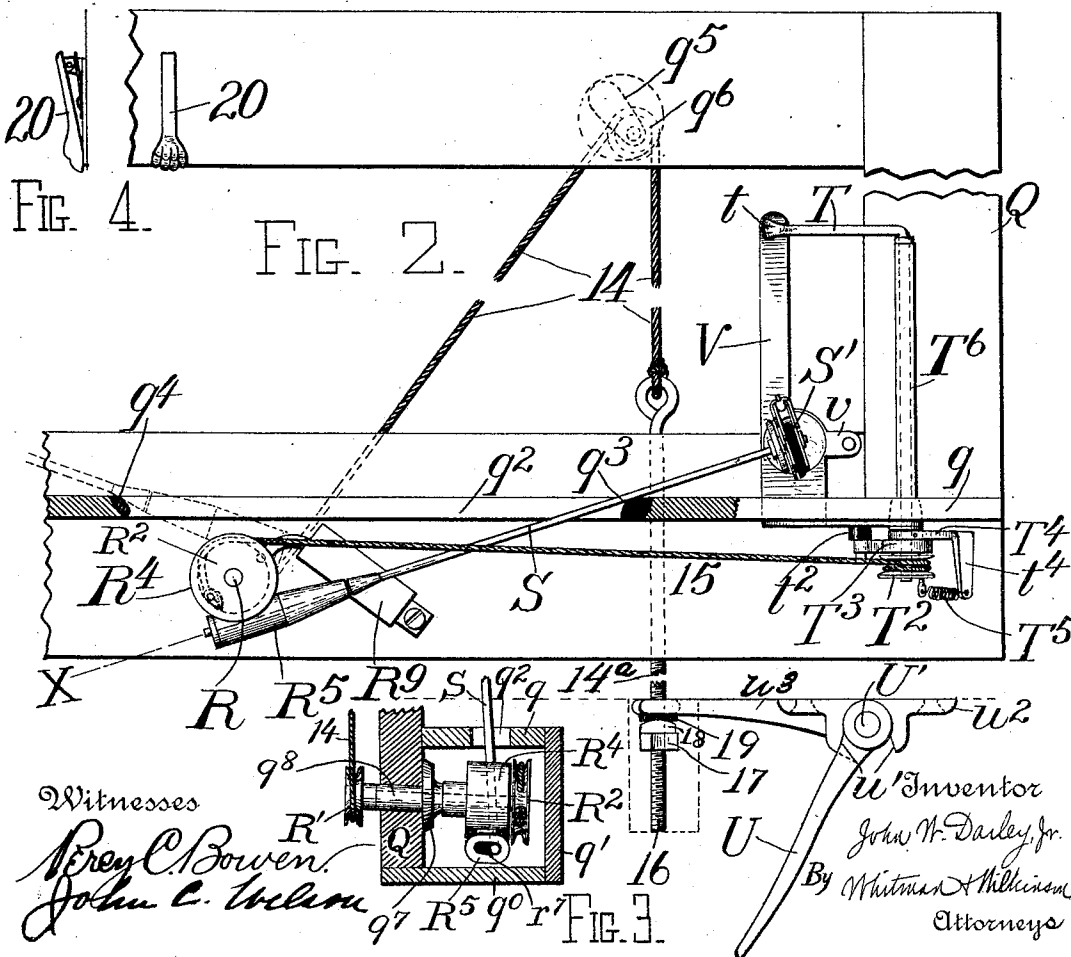
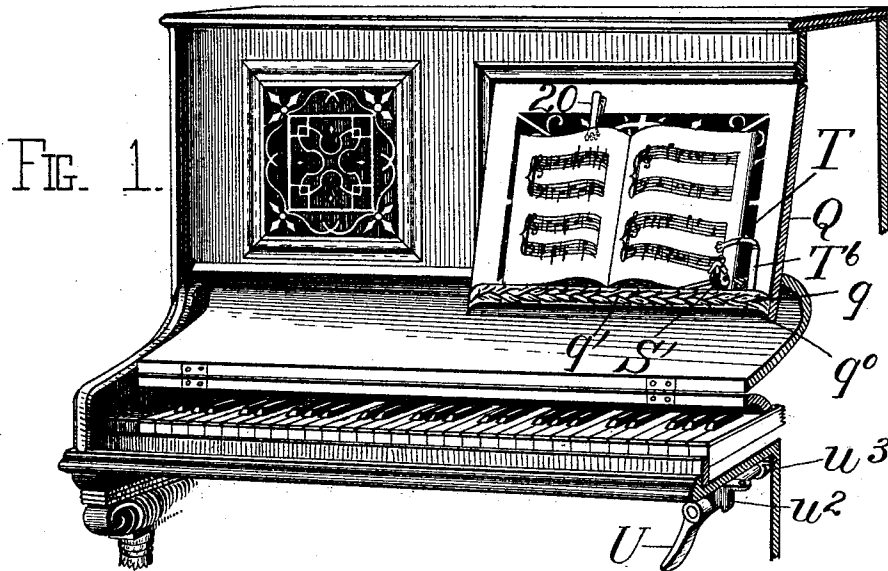
(No Model.)

3 Sheets—Sheet 1.

J. W. DARLEY, Jr.  
MUSIC LEAF TURNER.

No. 519,302.

Patented May 1, 1894.



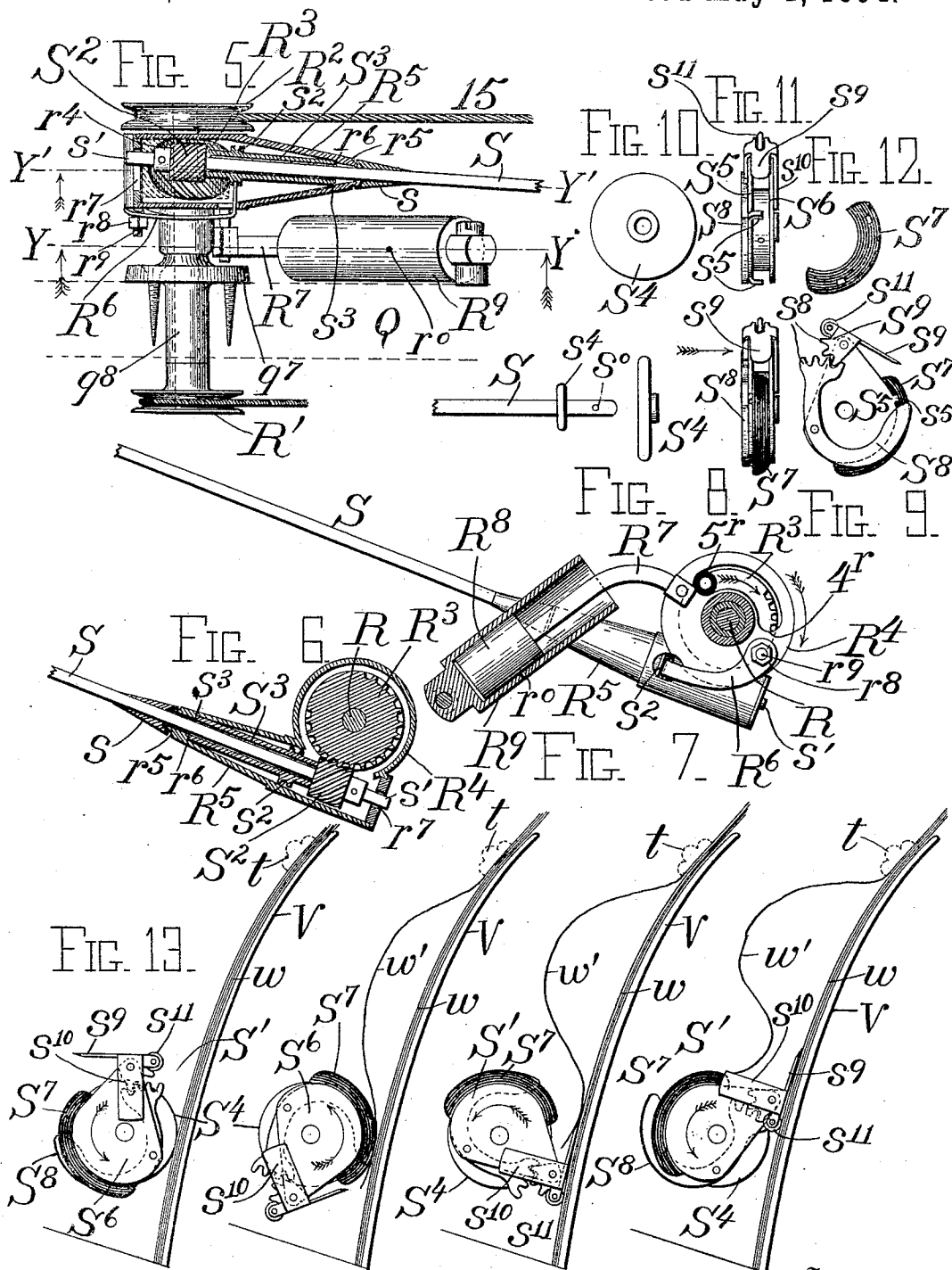
(No Model.)

3 Sheets—Sheet 2.

J. W. DARLEY, Jr.  
MUSIC LEAF TURNER.

No. 519,302.

Patented May 1, 1894.



Witnesses

*Rey C. Bowen.*  
*John L. Tolson*

FIG. 14.

FIG. 15.

FIG. 16.

Inventor

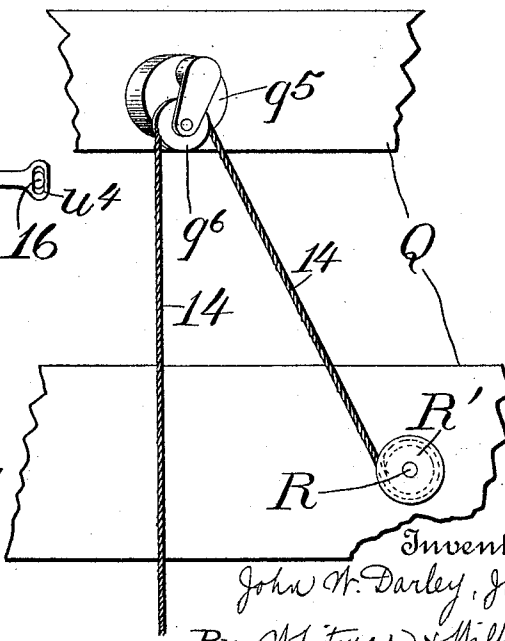
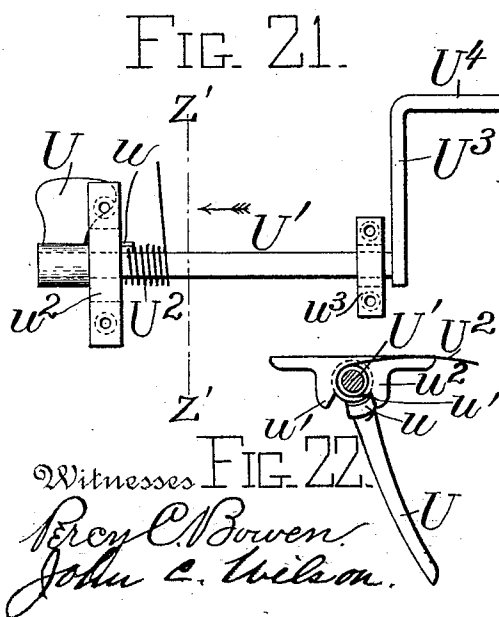
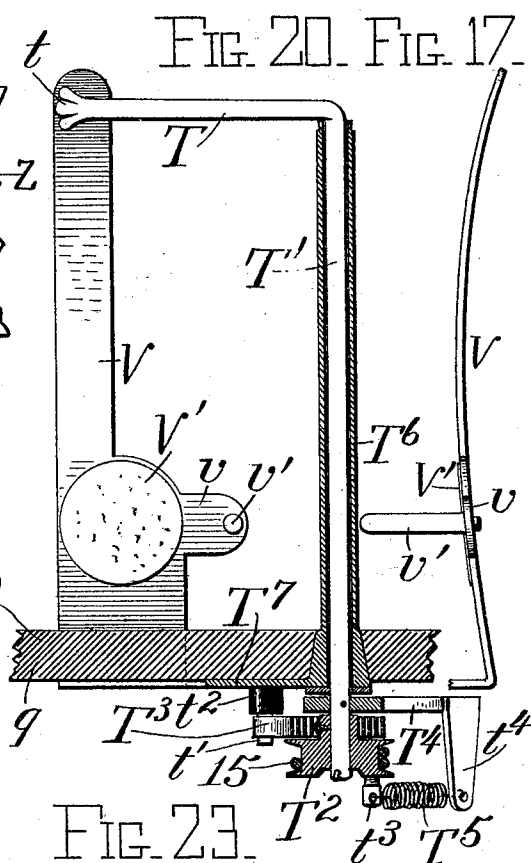
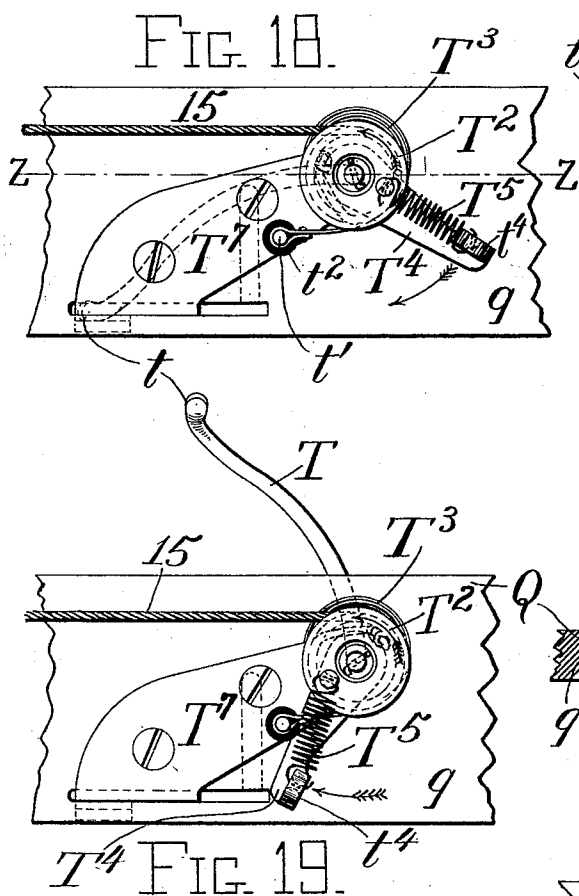
*John W. Darley Jr.,*

*By Whitman & Wilkinson,*  
Attorneys.

J. W. DARLEY, Jr.  
MUSIC LEAF TURNER.

No. 519,302.

Patented May 1, 1894.



Witnesses  
Percy C. Bowen.  
John C. Wilson.

Inventor  
John W. Darley, Jr.,  
By Whitman & Wilkinson  
Attorneys.

# UNITED STATES PATENT OFFICE.

JOHN W. DARLEY, JR., OF BALTIMORE, MARYLAND, ASSIGNOR OF ONE-HALF  
TO DAVID E. EVANS, PHILIP HAMBURGER, MICHAEL HOLZMAN, AND LEON  
HAMBURGER, OF SAME PLACE.

## MUSIC-LEAF TURNER.

SPECIFICATION forming part of Letters Patent No. 519,302, dated May 1, 1894.

Application filed May 20, 1893. Serial No. 474,970. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. DARLEY, JR., a citizen of the United States, residing at Baltimore, in the State of Maryland, 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.

My invention relates to improvements in music leaf turners, and it consists of certain novel features hereinafter described and claimed.

Reference is had to the accompanying drawings, in which the same parts are indicated by the same letters and figures throughout the several views.

Figure 1 represents a perspective view of an upright piano partly in section, and illustrates the application of my improved leaf turner thereto. Fig. 2, represents a front view of the frame of the music rack, showing the details of the leaf turner. Fig. 3 represents a section across the base of the music rack, and illustrates the inclined position of the shaft operating the leaf turner. Fig. 4 represents a side elevation of the leaf holder used in connection with my improved device. Fig. 5 represents an inverted plan view of a portion of the device. Fig. 6 represents a section along the line Y' Y' of Fig. 5; and Fig. 7 represents a section along the line Y Y of Fig. 5. Fig. 8 represents the various parts of the tip of the rolling wire ready for assembling, and Figs. 9, 10, 11, and 12 represent detail views of the adhesive tip and of the parts connected thereto. Figs. 13, 14, 15, and 16 represent the adhesive tip of the rolling wire, in the various positions assumed in turning the leaf. Fig. 17 represents a side elevation of the bent piece inserted under the leaves of the book or folio of music. Figs. 18 and 19 represent inverted plan views of the device for holding and releasing the corners of the leaves. Fig. 20 represents a sectional elevation of the said device, and of the parts contiguous thereto. Figs. 21 and 22 represent details of the operating lever or knee-swell, the former in plan view, and the

latter along the line Z' Z' looking to the left; and Fig. 23 represents a rear view of a portion of the frame of the music rack, and of the operating cord and pulleys connected thereto.

Q represents the music rack provided with a shelf  $q$  to support the music, and preferably with a bottom piece  $q^0$ , and an ornamental front piece  $q'$  to inclose the operating mechanism, and keep it out of sight, free from dust, and also from possible injury. The music rack is hinged to the top of the piano in the usual way. The shelf  $q$  is slotted as at  $q^2$ , and is provided with rubber or leather stops  $q^3$  and  $q^4$ , to prevent the rattling of the wire S. A frame  $q^5$  resting on a pad of leather or felt, also to prevent vibration, carries the roller  $q^6$  for the cord 14 connecting the rod 14<sup>a</sup> to the pulley R' keyed on the shaft R, set at a slight incline to the face of the music rack. This shaft revolves in the sleeve  $q^8$  provided with a flange  $q^7$  which is screwed to the music rack Q. Keyed on the shaft R is a spiral gear R<sup>3</sup> mounted in a casing R<sup>4</sup>, free to revolve about said gear. A second casing R<sup>5</sup> contiguous to and preferably integral with the said casing R<sup>4</sup> incloses the end of the rolling wire S. These two casings R<sup>3</sup> and R<sup>4</sup> form a frame revolvably mounted on the shaft R. The casings R<sup>4</sup> and R<sup>5</sup> are cut away as at  $r^4$  to allow the spiral pinion S<sup>2</sup> rigidly attached to the rolling wire S to bear against the gear R<sup>3</sup>, and the end  $s'$  of the said rolling wire passes through a slot  $r^7$  in the said casing R<sup>5</sup>. The forward end of the conical portion of the casing R<sup>5</sup> is provided with a tongue and shoulder  $r^5$ , and a shoulder  $r^6$ , against the former the bearing lug  $s$  made tapering as shown, and attached to the wire S, takes the inward thrust on the said wire; while the outer end  $s^2$  of the sleeve S<sup>3</sup>, takes up the outward thrust on the said wire. This sleeve S<sup>3</sup> is loosely mounted on the wire S and bears against the face of the pinion S<sup>2</sup>, thus transferring the thrust from the shoulder  $r^6$  to the face of the pinion S<sup>2</sup>. On this sleeve S<sup>3</sup> an annular disk grooved at  $s^2$  is revolvably mounted, and in this groove a spring R<sup>6</sup> engages. This spring is preferably made bent as shown, and is secured to the frame R<sup>4</sup> by the bolt  $r^9$  and nut

7<sup>a</sup>. The tension of the spring is adjusted by varying the position of this nut on the bolt.

A piston rod R<sup>1</sup> and piston R<sup>2</sup> are connected to the frame R<sup>4</sup>, as shown in Fig. 7 and the said piston moves in the cylinder R<sup>3</sup> attached to the frame Q, the whole forming a dash pot with air as the medium to be compressed. The hole r<sup>0</sup> in the cylinder R<sup>3</sup> allows the free egress of air during the first part of the stroke and so is to limit the cushion in the dash pot to nearly the end of the stroke. The dash pot is preferably made to cushion in only the return direction, being provided with a relief valve, not shown, which permits of free motion in the direction of operation. In order to prevent rattling, and lessen the jar when the gear R<sup>3</sup> communicates its motion to the case R<sup>4</sup>, an elastic stop 5<sup>r</sup> is so arranged that it will bring up against the curved end 4<sup>r</sup> of the curved slot in the bottom of the frame R<sup>4</sup>, the stop 5<sup>r</sup> being attached to the spiral gear R<sup>3</sup>, as shown in Fig. 7. The angle of the spiral on the gear R<sup>3</sup> and also on the pinion S<sup>2</sup> is forty-five degrees, although any other suitable angle might be adopted.

The rolling wire S is provided at its opposite end from the pinion S<sup>2</sup>, with a leaf-lifting device S'. This consists of the various parts shown in detail in Figs. 10 to 16. S<sup>4</sup> represents a disk loose on the end of the wire S, and slipped on the said wire just outside of the fixed collar s<sup>4</sup>. Outside of this disk two pear-shaped plates S<sup>5</sup> and S<sup>6</sup> are slipped on the wire S one of which is provided with prongs s<sup>3</sup> to engage in the piece S<sup>7</sup> of rubber, preferably containing some abrading material. These two plates are connected together and the rubber piece is held between them by the prongs s<sup>5</sup>. On the outside of one of these plates, as S<sup>5</sup>, the curved levers S<sup>8</sup> and S<sup>9</sup> are pivoted, having teeth s<sup>8</sup> meshing with each other. The smaller lever is provided with a roller s<sup>11</sup>, and a catch s<sup>9</sup>, as shown in Fig. 9. The side of the small lever S<sup>9</sup> opposite to the teeth s<sup>8</sup> is provided with a guide arm s<sup>10</sup> to prevent the edge of the paper from catching on the rubber rim in the act of lifting the sheet. The lifting device S' is secured on the end of the wire S by a pin through the hole s<sup>0</sup> shown in Fig. 8.

The corner of the leaf is held, and released at the proper moment by the swinging arm T provided with an enlarged tip t adapted to have a good bearing surface on the paper. This arm T is connected to or integral with the vertical shaft T' carrying at its lower end the pulley T<sup>2</sup> loosely mounted thereon, and kept under normal tension by the spiral spring T<sup>3</sup> connected by the bolt t' to the base plate T<sup>7</sup>. A felt pad or washer t<sup>2</sup> is interposed between the spring and the base plate T<sup>7</sup> to form a stop for the bent arm T<sup>4</sup>.

T<sup>4</sup> represents an arm projecting from the vertical shaft T', and rigidly attached thereto; the said arm is provided with a downwardly projecting tip t<sup>4</sup> connected by the spring T<sup>5</sup> to the screw t<sup>3</sup> screwed into the pulley T<sup>2</sup>.

The vertical shaft T' is free to revolve in the sleeve T<sup>6</sup> which is firmly attached to the shelf q by a base plate T<sup>7</sup>. The pulley T<sup>2</sup> is connected with the pulley R<sup>2</sup> by means of the cord 15, as shown in Fig. 2.

The leaf turner and leaf holder are operated by a lever or knee-swell U preferably projecting downward beneath the front of the keyboard of the piano. This knee-swell is mounted on a shaft U' revolving in journal bearings u<sup>2</sup> and u<sup>3</sup>, the former of which is provided with shoulders u' adapted to limit the motion of the knee swell through the desired angle, the said knee-swell being provided with a lug u projecting between and adapted to engage one of these shoulders at either end of its travel. Rigidly attached to the end of the shaft U' is the rod U<sup>3</sup> bent at right angles as at U<sup>4</sup> and terminating in an oblong slot u<sup>4</sup> through which the threaded end 16 of the rod 14<sup>a</sup> passes. The nuts 17, and 18, and felt pad 19 afford a ready means of adjusting the tension on the cord 14, at the same time deaden vibration, and also permit of the parts being disconnected when it is desired to tune the piano. A spiral spring U<sup>2</sup> is secured at one end to the lug u provided on the knee swell U, and has its other end bearing against some portion of the piano; the function of this spring is to resist to the requisite degree the tension of the spring T<sup>3</sup> and prevent the sudden release of the knee swell and consequent slackening of the cords 14 and 15.

Attached to the shelf q near the lower right hand corner of the music rack, I provide a curved metallic piece V, provided with a pad of paper V' on the face thereof, and a projecting arm v carrying a pin v' at right angles thereto, as shown in Figs. 17 and 20.

The spring holder shown in Fig. 4 consists of a simple well known device 20 used to hold the opposite side of the book, folio or leaf of music from that to be turned. This is not essential to the operation of the device, however, and is not a part of my invention.

The operation of my improved device is as follows:—The book or piece of music to be turned is placed on the music rack in the usual way, and is slid along to the right until the lower right hand corner of the leaf strikes against the pin v', when the music will be in position to be operated upon. If the book or folio have stiff backs, the back is slid behind the rest V, the weight of the leaves will cause them to bend over the face of the rest V in approximately the curve shown in Figs. 13 to 16, in which position they are further held by the initial pressure of the arm T and of the lifting device S'. It is desirable to have the leaves bent over somewhat, as in this way, since they are very much more readily lifted when curved than when straight.

With the ordinary sheet music it will not be necessary to put the back of the sheet behind the curved piece V since these sheets are ordinarily sufficiently flexible to adapt themselves to the curve desired. The paper disk

or pad V' is put on the face of the curved piece V in order to obtain the necessary amount of friction between the last sheet and the rest V behind the same, for otherwise two or more sheets might be slipped together up the bent piece V, and thus the desired effect of turning the leaves *seriatim* would not be obtained. The music being in position, it is pressed upon by the arm T under the tension of the spring T<sup>5</sup> and by the lifting device S' under the tension of the spring R<sup>6</sup>, which presses on the inner end of the rolling wire S, which causes the outer end carrying the lifting device to bear against the paper. The rolling wire, as will be seen is virtually a revolving lever having a fulcrum at r<sup>5</sup>, and a tension on one end of this lever will produce a corresponding pressure on the opposite end of this lever. By means of this spring R<sup>6</sup> an initial pressure is given the lifting device to insure perfect contact with the paper before the operation of the knee-swell begins, and this initial pressure may be readily adjusted to meet the requirements of the individual instrument. The music being in a position for turning, the leaves, may be turned *seriatim* by simply pressing on the knee-swell U, and then relieving the pressure and allowing the spring T<sup>3</sup> and cord 15 to return the knee-swell to the original position. As the knee-swell is pressed over, the arm U<sup>3</sup> is brought down pulling on the cord 14 and revolving the pulley R' and the shaft R. This shaft carries with it the spiral gear R<sup>3</sup> which causes the pinion S<sup>2</sup> to revolve, and at the same time the angle of the teeth causes the said pinion to be pressed out and the lifting device S' in toward the paper, thus increasing the pressure on the said paper, and at the same time revolving the device S' on the surface thereof. The operation of the leaf turner and lifter is represented in Figs. 13 to 16, where Fig. 13 shows the initial position of the leaf lifter, the disk S<sup>4</sup> pressing on the face of the music; as the wire S revolves, the adhesive rim S<sup>7</sup> is brought into the position shown in Fig. 14, pressing up the leaf w' from the body of the leaves w, and bringing the catch s<sup>9</sup> into position for passing beneath the bottom edge of the paper, as shown in Fig. 15, at which time the roller s<sup>11</sup> slides along the face of the paper holding the point of the catch down. It will be seen in the said figures that the lever S<sup>9</sup> is free to assume any position between those positions shown in Figs. 13 and 16 but that the catch s<sup>9</sup> must always be in the position shown in Fig. 14 before the roller has turned sufficiently to bring the catch s<sup>9</sup> upon the paper, as thereby the end of the catch s<sup>9</sup> is prevented from catching in the next leaf to the one to be turned; this is insured by the construction of the lever S<sup>9</sup> one end of which gears into the lever S<sup>9</sup>, the other end of lever S<sup>9</sup> being curved in such a manner as to bring about the desired result by reason of bearing on the music leaves. Up to this time the claw t has been holding the leaf

down, but the cord 15 is so adjusted that the pulley T<sup>2</sup> will be swung around sufficiently to carry the spring T<sup>5</sup> past a center causing the pressure of the spring T<sup>5</sup> to bear on the opposite side of the arm T<sup>4</sup>, and to swing the arm T clear of the music above the rest V and release the leaf, which is then thrown over by the wire S, the stop 5<sup>r</sup> having in the mean time struck the groove 4<sup>r</sup> and the motion of the spiral gear having been transmitted to the frame R<sup>4</sup> in which the said wire S is mounted. It will be seen by an inspection of Fig. 16, that the arm s<sup>10</sup> will prevent the bottom edge of the leaf from catching behind the rim S<sup>7</sup>, and becoming injured by the teeth s<sup>8</sup>. After the position shown in Fig. 16 has been reached, the part S' continues to revolve until it reaches the position shown in Fig. 13, when the stop 5<sup>r</sup> strikes the end of the groove 4<sup>r</sup> and the revolution of the wire ceases, in which position the roller will be fully under the sheet lifted and the disk S<sup>4</sup> will be bearing on the second sheet, insuring free motion while the sheet just lifted is about to be turned. As soon as the claw t has released the sheet about to be turned, by reason of the continued motion of the pulley R<sup>2</sup>, cord 15, pulley T<sup>2</sup> and various parts connected thereto, the spring T<sup>5</sup> will again cross the center and bring the claw t upon the music leaves, thus preventing any leaves from following the leaf being turned, as the rapid motion of the leaf being turned causes a partial vacuum and consequently an air draft. As soon as the leaf is swung over, the pressure on the knee-swell is withdrawn, and the spring U<sup>2</sup> will oppose the spring T<sup>3</sup> acting through the medium of the connecting cords 14 and 15, and will ease the knee-swell back to the initial position and so at all times will keep the cords taut. At the same time the spring T<sup>3</sup> will wind up the cord 15 on the pulley T<sup>2</sup>, thus turning the pulley R<sup>2</sup> and shaft R, and causing the lifting device S' to return to the initial position shown in Fig. 2. At the same time the cord 14 will wind up on the pulley R', and the apparatus will be in complete readiness to turn another leaf. In this way the leaves may be turned *seriatim* until the rest V is laid bare. While the initial pressure of the lifting device S' is made sufficient by the spring R<sup>6</sup> to insure perfect contact with the paper, the subsequent pressure on the lifting device occasioned by the pressure on the knee-swell, will be a function of the energy expended on the said knee-swell. The energy so exerted, owing to the angularity of the spiral teeth of the gear wheel R<sup>3</sup> and the pinion S<sup>2</sup> will be converted into two factors, each practically equal, the one causing a thrust on the shoulder r<sup>6</sup> may be neglected; the other performs a two-fold function, first to revolve the pinion S<sup>2</sup>, and second to move it bodily outward in the direction of the elongated slot r<sup>7</sup> in the frame. The revolution of the pinion and wire S moving therewith causes the adhesive rim S<sup>7</sup> to push the

paper along in front of it, and pick it up; and the bodily movement of the pinion outward or along the slot  $r'$  will produce the requisite pressure on the face of the paper. Now, the coefficient of friction between the adhesive rim and the paper being greater than that between two sheets of paper, if the pressure of the lifting device  $S'$  upon the paper is never more than just enough to prevent the adhesive tip slipping, the single sheet of paper must yield, and must be lifted by the lifting device  $S'$ . The limit of the thickness of the paper that may be lifted depends upon the amount of pressure that it is possible to bring to bear, thus a very thin sheet will be lifted with very little pressure, while even a cardboard sheet may be lifted with an ordinary machine by bringing the requisite force to bear on the knee-swell. Independent of the pressure applied to the knee-swell, the pressure producing friction on the rubber rim will never be more than just enough to prevent the rubber rim from slipping on the paper, and thus it will be seen that the instrument adapts itself automatically to varying thicknesses of paper. This characteristic of the device also enables the leaf turner to turn torn music, and music which has been creased or rumpled, as it is evident that the pressure required to separate a sheet of music will vary if the sheet is rumpled or torn. The sleeve  $q^8$  is so placed upon the frame  $Q$  with reference to the pin  $v'$  that the center of the shaft  $R$  will come a little to the right of the center of the smallest book, it is designed to use, as thereby the catching of the lifting device  $S'$  in the edge of the leaf just turned is prevented. It will be noticed that the flange  $q^7$  is at an angle to the sleeve  $q^8$ , in order to bring the lifting device  $S'$  upon the music at the beginning and end of its travel and to give a leverage upon the music at the intermediate points.

It is obvious that many modifications will readily suggest themselves to any one skilled in the art, which could be used without departing from the spirit of my invention.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a music leaf turner, the combination with a shaft and means for revolving said shaft in alternate directions through any desired angle, of a spiral gearwheel rigidly attached to said shaft, a frame revolubly mounted on said shaft and having a limited angular motion relative to said gear wheel, a rolling wire mounted in said frame; an adhesive tip attached to said wire and adapted to bear on the music sheet, and a spiral pinion meshing in said gear wheel, and rigidly mounted on said rolling wire, substantially as and for the purposes described.

2. In a music leaf turner, the combination with a shaft and means for revolving said shaft in alternate directions through any desired angle, of a spiral gearwheel rigidly at-

tached to said shaft, a frame revolubly mounted on said shaft and having a limited angular motion relative to said gear wheel, the said frame being provided with a slot parallel to the axis of said shaft; a rolling wire pivoted in said frame and having its rear end projecting through said slot and its front end provided with an adhesive tip adapted to bear on the music sheet; and a spiral pinion meshing in said gear wheel and rigidly mounted on said rolling wire, substantially as and for the purposes described.

3. In a music leaf turner, the combination with a rolling wire provided with an adhesive tip adapted to engage the leaf, and a pivoted catch adapted to pass behind said leaf, of a spring normally pressing said tip on said leaf, and means for increasing the pressure of said tip on said leaf, of revolving said wire, and of swinging the said wire and turning said leaf, substantially as described.

4. In a music leaf turner, the combination with a shaft and means for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, a rolling wire mounted in said frame; an adhesive tip attached to said wire and adapted to bear on the music sheet, and a spiral pinion meshing in said gear wheel, and rigidly mounted on said rolling wire, substantially as and for the purposes described.

5. In a music leaf turner, the combination with a shaft and means for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, the said frame being provided with a slot parallel to the axis of said shaft; a rolling wire pivoted in said frame and having its rear end projecting through said slot and its front end provided with an adhesive tip adapted to bear on the music sheet; and a spiral pinion meshing in said gear wheel and rigidly mounted on said rolling wire, substantially as and for the purposes described.

6. In a music leaf turner, the combination with a pivoted rolling wire provided with an adhesive tip adapted to engage the leaf, and a pivoted catch mounted on said tip and adapted to pass behind said leaf, of a spring normally pressing said tip on said leaf, means for pressing the inner end of said wire outward and the outer end carrying said tip inward and so increasing the pressure of said tip on said leaf, of revolving said wire, and of swinging the said wire and turning said leaf, substantially as described.

7. In a music leaf turner, the combination

with a shaft, of a pulley on said shaft, a system of cords and pulleys and a lever or knee swell and an operating spring connected thereto, for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, a rolling wire mounted in said frame; an adhesive tip attached to said wire and adapted to bear on the music sheet, and a spiral pinion meshing in said gear wheel, and rigidly mounted on said rolling wire, substantially as and for the purposes described.

8. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys and a lever or knee swell and an operating spring connected thereto, for revolving said shaft in alternate directions through any desired angle, a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, the said frame being provided with a slot parallel to the axis of said shaft; a rolling wire pivoted in said frame and having its rear end projecting through said slot and its front end provided with an adhesive tip adapted to bear on the music sheet; and a spiral pinion meshing in said gear wheel and rigidly mounted on said rolling wire, substantially as and for the purposes described.

9. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys and a knee-swell or lever and an operating swing connected to said shaft for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, a rolling wire mounted in said frame; an adhesive tip attached to said wire and adapted to bear on the music sheet, a spiral pinion meshing in said gear wheel, and rigidly mounted on said rolling wire, and a vertical shaft connected to said operating spring and provided with a holding arm and means for releasing said arm as said rolling wire is swung over, substantially as and for the purposes described.

10. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys and a knee-swell or lever and an operating spring connected to said shaft for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a

frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, the said frame being provided with a slot parallel to the axis of said shaft; a rolling wire pivoted in said frame and having its rear end projecting through said slot, and its front end provided with an adhesive tip adapted to bear on the music sheet; and a spiral pinion meshing in said gear wheel rigidly mounted on said rolling wire, a vertical shaft connected to said operating spring and provided with a holding arm and means for releasing said arm as said rolling wire is swung over, substantially as and for the purposes described.

11. In a music leaf turner, the combination of a pivoted rolling wire provided with an adhesive tip adapted to engage the leaf, a pivoted catch mounted on said tip and adapted to pass behind said leaf, a curved lever pivoted on said tip and adapted to operate said catch, a spring normally pressing said tip on said leaf, means for pressing the inner end of said wire outward and the outer end carrying said tip inward and so increasing the pressure of said tip on said leaf, of revolving said wire, and of swinging the said wire and turning said leaf, substantially as described.

12. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys and a lever or knee swell and an operating spring connected thereto, for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, a rolling wire mounted in said frame; an adhesive tip attached to said wire and adapted to bear on the music sheet, a pivoted catch and a curved lever for operating said catch both mounted on said tip, and a spiral pinion meshing in said gear wheel, and rigidly mounted on said rolling wire, substantially as and for the purposes described.

13. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys and a lever or knee swell and an operating spring connected thereto, for revolving said shaft in alternate directions through any desired angle, a spiral gear wheel attached rigidly to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, the said frame being provided with a slot parallel to the axis of said shaft; a rolling wire pivoted in said frame and having its rear end projecting through said slot and its front end provided with an adhesive tip adapted to bear on the music sheet; a pivoted catch and a curved le-

ver for operating said catch both mounted upon said tip; and a spiral pinion meshing in said gear wheel and rigidly mounted on said rolling wire, substantially as and for the purposes described.

14. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys and a knee-swell or lever and an operating spring connected to said shaft, for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, a rolling wire mounted in said frame; an adhesive tip attached to said wire and adapted to bear on the music sheet, a pivoted catch and a curved lever for operating said catch both mounted upon said tip, a spiral pinion meshing in said gear wheel, and rigidly mounted on said rolling wire, and a vertical shaft connected to said operating spring and provided with a holding arm and means for releasing said arm as said rolling wire is swung over, substantially as and for the purposes described.

15. In a music leaf turner, the combination with a shaft, of a pulley on said shaft, a system of cords and pulleys, and a knee swell or lever and an operating spring connected to said shaft, for revolving said shaft in alternate directions through any desired angle, of a spiral gear wheel rigidly attached to said shaft, a stop attached to said gear wheel, a frame revolubly mounted on said shaft and having a curved slot therein adapted to engage said stop and allow a limited angular motion relative to said gear wheel, the said frame being provided with a slot parallel to the axis of said shaft; a rolling wire pivoted in said frame and having its rear end projecting through said slot, and its front end provided with an adhesive tip adapted to bear on the music sheet a pivoted catch and a curved lever for operating said catch both mounted upon said tip; and a spiral pinion meshing in said gear wheel rigidly mounted on said rolling wire, a vertical shaft connected to said operating spring and provided with a holding arm and means for releasing said arm as said rolling wire is swung over, substantially as and for the purposes described.

16. In a music leaf turner, the combination with a device for turning the leaves, of a leaf holding and releasing device comprising a shaft journaled in the music rack, an arm projecting from said shaft and adapted to hold the music, a second arm rigidly connected to said shaft, a pulley loosely journaled on said shaft, a spring connecting said second arm and said pulley, and means for revolving said pulley synchronously with the operation of the leaf turner, whereby said second arm is drawn first to one side and then to the oppo-

site side by said spring, substantially as and for the purposes described.

17. In a music leaf turner, the combination with means for turning the leaves of a leaf holding and releasing device comprising the shaft T' provided with the arms T and T<sup>4</sup> and the pulley T<sup>2</sup>, and the spring T<sup>5</sup>, the cord 15, and means for pulling on said cord synchronously with the operation of the leaf turner, whereby the music is alternately held and released, substantially as and for the purposes described.

18. In a music leaf turner, the combination with means for turning the leaves, of a leaf holding and releasing device comprising the shaft T' bent as at T, the arm T<sup>4</sup> rigidly attached to said shaft, the pulley T<sup>2</sup> loosely journaled on said shaft, the cord 15 is wound on said pulley, the spring T<sup>3</sup> normally tending to revolve said pulley and wind up said cord, means for unwinding said cord against said spring, and a spring T<sup>5</sup> connecting said pulley T<sup>2</sup> and said arm T<sup>4</sup>, substantially as and for the purposes described.

19. In a machine of the character described, the combination with a rolling wire and means for revolving the same, of an adhesive tip attached to said wire for lifting and turning the leaf, comprising a frame, a piece of rubber or other adhesive material in the form of a segment of a ring mounted in said frame, and a disk journaled on said wire at one side of said frame and extending nearly to the edge of said rubber piece, the said disk being adapted to clear the music when said rubber piece is lifting a leaf, and to bear upon the music at the beginning and end of the revolution of the rolling wire, substantially as and for the purposes described.

20. In a machine of the character described, the combination with a rolling wire and means for revolving the same, of an adhesive tip attached to said wire for lifting and turning the leaf, comprising a frame, a piece of rubber or other adhesive material in the form of a segment of a ring mounted in said frame, and a disk journaled on said wire at one side of said frame and extending nearly to the edge of said rubber piece, the said disk being adapted to clear the music when the said rubber piece is lifting a leaf, and to bear upon the music at the beginning and end of the revolution of the rolling wire, a pivoted catch mounted on said frame, and means for operating said catch, substantially as and for the purposes described.

21. In a machine of the character described, the combination with a rolling wire and means for revolving the same, of an adhesive tip attached to said wire for lifting and turning the leaf, comprising a frame, a piece of rubber or other adhesive material in the form of a segment of a ring mounted in said frame, and a disk journaled on said wire at one side of said frame and extending nearly to the edge of said rubber piece, the said disk being adapted to clear the music when the rub-

ber piece is lifting a leaf, and to bear upon the music at the beginning and end of the revolution of the rolling wire, a pivoted catch mounted on said frame, a curved lever also  
5 pivoted on said frame and adapted to operate said catch, substantially as and for the purposes described.

22. In a machine of the character described, the combination with a rolling wire and  
10 means for revolving the same, of an adhesive tip attached to said wire for lifting and turning the leaf, comprising a frame, a piece of rubber or other adhesive material in the form of a segment of a ring mounted in said frame,  
15 and a disk journaled on said wire at one side of said frame and extending nearly to the edge of said rubber piece, the said disk being adapted to clear the music when the rub-

ber piece is lifting a leaf, and to bear upon the music at the beginning and end of the 20 revolution of the rolling wire, a pivoted catch lever having a downward projecting arm on one side of said frame and teeth on the opposite side of said frame, a lever pivoted to said frame provided with teeth adapted to 25 engage with the teeth of the catch lever, and having a curved arm adapted to engage the sheets of music not being lifted, substantially as and for the purposes described.

In testimony whereof I affix my signature in 30 presence of two witnesses.

JOHN W. DARLEY, JR.

Witnesses:

HENRY E. HAMBURGER,  
FERD. HAMBURGER.