

J. A. ANDREW.
 AUTOMATIC LEAF TURNER.
 APPLICATION FILED APR. 8, 1911.

1,022,921.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 1.

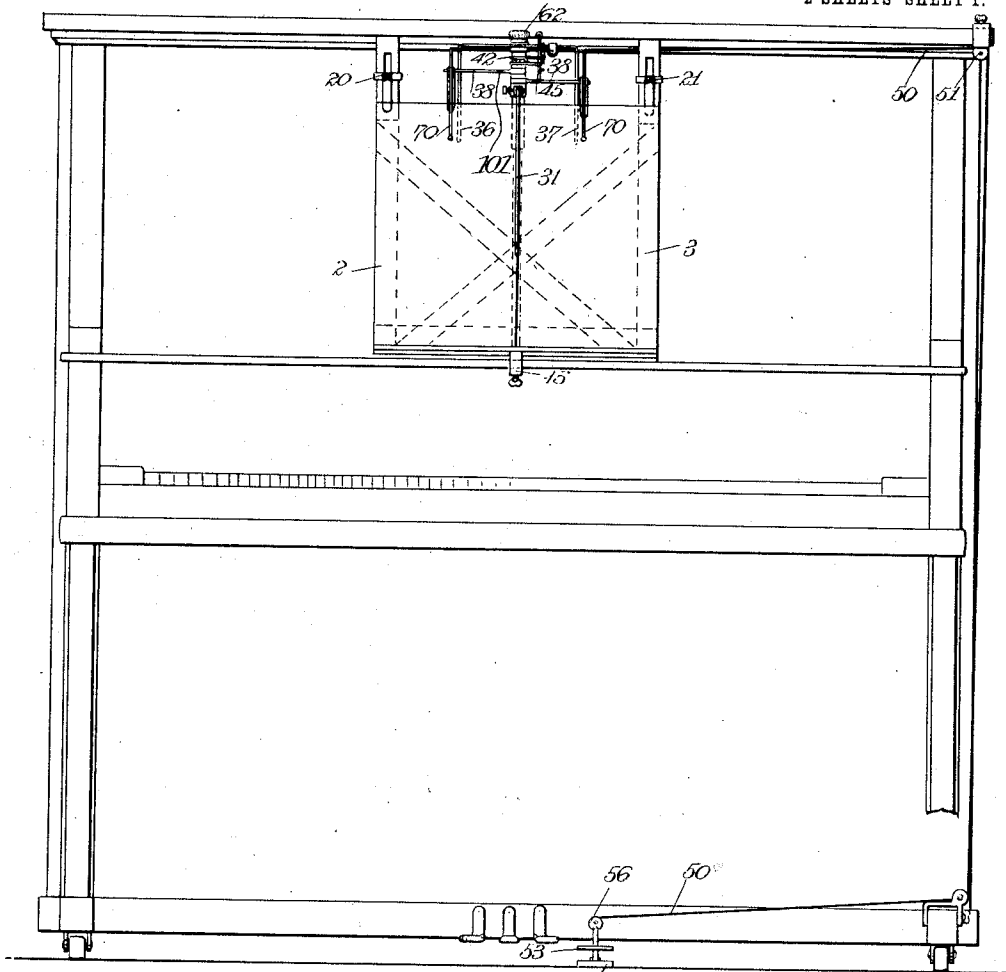


Fig. 1.

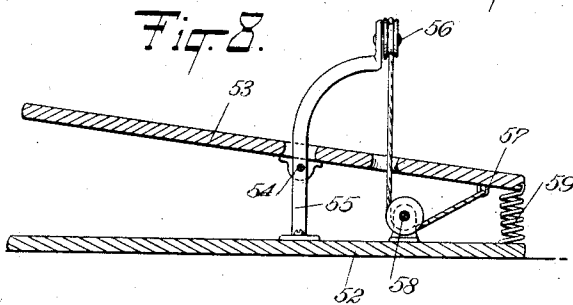


Fig. 8.

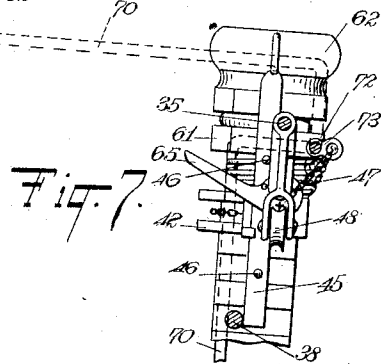


Fig. 7.

WITNESSES

George Bamlay.
 A. J. Gallagher.

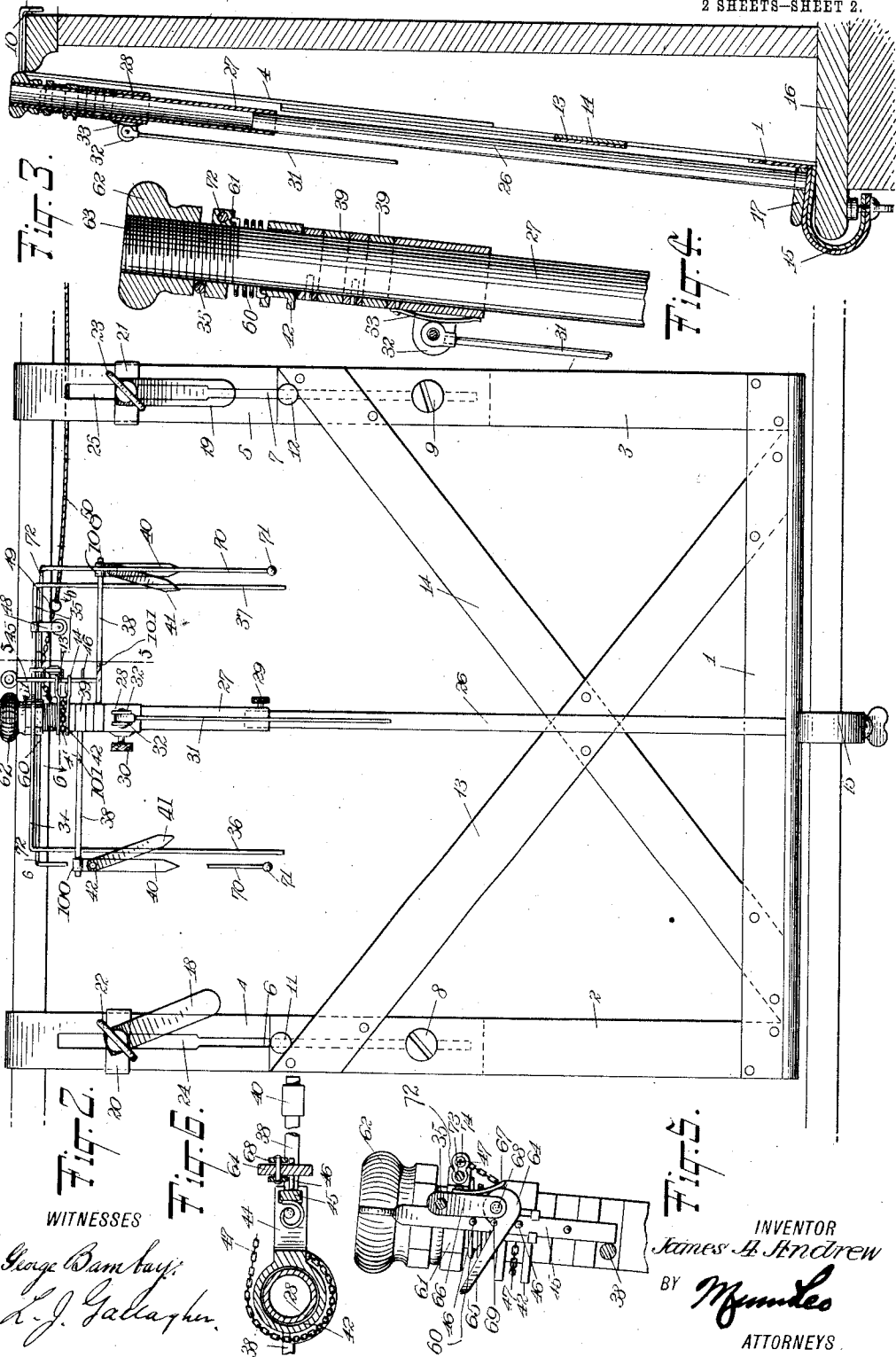
INVENTOR
 James H. Andrew
 BY *Mumford*
 ATTORNEYS

J. A. ANDREW.
 AUTOMATIC LEAF TURNER.
 APPLICATION FILED APR. 8, 1911.

1,022,921.

Patented Apr. 9, 1912.

2 SHEETS—SHEET 2.



WITNESSES
 George Bamberg
 L. J. Gallagher

INVENTOR
 James A. Andrew
 BY *Mumford*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES ARCHIBALD ANDREW, OF VICTORIA, BRITISH COLUMBIA, CANADA.

AUTOMATIC LEAF-TURNER.

1,022,921.

Specification of Letters Patent.

Patented Apr. 9, 1912.

Application filed April 8, 1911. Serial No. 619,713.

To all whom it may concern:

Be it known that I, JAMES A. ANDREW, a subject of the King of Great Britain, and a resident of Victoria, in the Province of British Columbia and Dominion of Canada, have invented a new and Improved Automatic Leaf-Turner, of which the following is a full, clear, and exact description.

My invention relates to a mechanism for turning the leaves of a book, and more specifically the elements thereof are constructed to adapt the device to turning successive sheets containing a musical composition.

The object of the invention is to provide a mechanism of the class described which may be easily attached to the frame of a piano or any other suitable support such as a music stand, there being a plurality of means for holding the book, or sheets of music, in position, together with elements engaging the leaves whereby they may be turned.

A further object of the invention is to provide a mechanism of the class described having means for holding the leaves in position whereby they may be held against movement when the composition thereon is being played, thereby saving the performer the annoyance due to the leaves changing position.

A further object of the invention is to provide a mechanism of the class described adapted to contain any number of leaf-engaging fingers whereby the construction may be used with books containing a plurality of leaves.

Reference is to be had to the accompanying drawings forming a part of this specification, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a front view of my device in position for use on an upright piano; Fig. 2 is a front view of the mechanism by itself; Fig. 3 is a vertical sectional view of the mechanism in position on a piano; Fig. 4 is a vertical sectional view of the upper end portion of the supporting post; Fig. 5 is a detail vertical sectional view on the line 5—5 of Fig. 2; Fig. 6 is a detail horizontal sectional view on the line 6—6 of Fig. 2; Fig. 7 is a side view of the upper end of the post, partly in section; Fig. 8 is a vertical sectional view of the pedal for operating the leaf turning device.

The mechanism is made up of the frame

member for holding the book or sheets in position, this member being attached to the piano, and the sheet turning device which is removably carried by the said frame member.

The frame member is preferably rectangular in outline and comprises the lower horizontal member 1 at the ends of which the uprights 2 and 3 are suitably secured. The uprights 2 and 3 consist of two members 2 and 4, and 3 and 5, respectively, the members of each upright being movable longitudinally with respect to each other by means of slots 6, 7, contained in the uprights; the members 4 and 5 are each provided with a holding screw 8 and 9 engaging in the said slots whereby each pair of members may be secured together in proper relation depending on the piano or music stand with which the mechanism is used.

The upper end of each of the members 4, 5 is preferably hook-shaped as at 10, and since no horizontal member connecting these end members is contemplated, the members 2, 4 and 3, 5, are held in alinement with each other by means of a pin 11, and 12, carried by 2 and 3 respectively, engaging in the said slots 6 and 7. The rectangular conformation of the frame is maintained by diagonally extending braces 13, 14, secured to each other and to the said frame members, 2, 3.

I have shown the device adapted to a piano and in Fig. 3 illustrated the method of attachment. The previously mentioned hooks 10, which are preferably lined with felt, engage the upper front end of the piano frame, and the horizontally extending frame member 1 is provided with a suitable clamp 15, preferably provided with a felt lining, having a winged thumb screw whereby the clamp may engage the ledge 16 of the piano frame thereby securing the frame firmly in position.

The aforesaid member 1 is preferably of integral construction, the lower outwardly extending portion 17 thereof forming a rest or support for the covers of the book or sheets; it will be noted that the obtuse angle construction leaves the lower edges of the sheets free of the portion 17. The upper opposite end portions of the covers are held in engagement on the frame by means of the clips 18, 19, pivotally secured at one end to the straps 20, 21, by means of the winged thumb-screws 22, 23; the slots 6, 7, con-

tained in the members 4, 5, are enlarged at their upper end portions whereby the slots 24, 25 are formed; the said straps 20, 21, have their end portions bent around the members 4, 5, whereby they may freely slide, and the said winged thumb-screws 22, 23, extend through suitable openings in the straps and into the enlarged slots 24, 25. Such a construction adapts the frame to securely hold books of varying sizes, and in order that the said clips may not interfere with the reading of the music they are preferably made of transparent material.

Suitably secured to the member 1 at approximately a central portion thereof is a vertical post 26, having a larger cylindrical member 27 at its upper end, while a still larger cylindrical member 28 is secured at the upper end of the member 27, whereby these three members are movable relatively to each other and a telescoping construction is afforded whereby the leaf turning device carried by the member 28 is adjustable to sheets of varying heights; thumb screws 29, 30 are provided as a means for holding these members in engagement with each other.

Hereafter the members 26, 27, and 28, will be collectively designated as a post.

Adjacent the upper end of the post is a needle 31 pivotally supported in suitable bearings 32; when a book or a number of sheets have been placed on the frame the needle is brought into engagement with the central portion thereof whereby a fulcrum is provided about which the sheets may turn; the needle is held in any position by means of a leaf spring 33 carried by the post in the rear of the needle and bearing thereagainst.

As a further means for engaging the covers of the sheets as an aid to insuring their security I have provided oppositely extending arms 34, 35, suitably supported on the upper end portion of the post, and each provided with a downturned part 36, 37, which parts are adapted to engage the inside of the covers.

The leaf turning device carried by the upper end of the post 28 comprises the following elements; a plurality of arms 38 having an enlarged end portion 39 which is pivotally mounted at the upper end of the post 27, each provided at its outer end with fingers made up of the two portions 40, 41, pivoted together at 42 whereby a leaf may be easily inserted in each finger; the downturned end 100 of each of these arms is frictionally engaged on the arm 38 whereby it may be moved into different positions thereon depending on the size of the sheet engaged. It will also be noted that each of the arms 38 is made up of two parts pivotally secured to each other at 101 whereby the outer end portion of each of the arms may be moved upwardly when it is desired to bring the fingers thereon into engagement

with a sheet positioned on the frame. Above the arms and rotatably secured on the post is a frame 42 having a bifurcated end portion 43, 44, and carrying at its outer end a rack 45, (shown in detail in Fig. 5) the said rack being provided with a plurality of laterally projecting pins 46; the said frame with the rack thereon is designed to be turned around the post 27, and to accomplish the turning I provide a suitable chain or cord 47 extending around the periphery of the frame and connected thereto, this chain or cord being led through a roller 48 suitably mounted on the arm 35, the chain being detachably connected by a ring 49 to a flexible cord 50. The cord 50 preferably extends adjacent the top of the piano and a pulley 51 is provided at the end thereof whereby the cord may be extended downwardly to the base of the piano.

As a convenient means for turning the frame I provide a pedal adjacent the pedals of the piano and consisting of a base 52, a lever 53 suitably pivoted at 54 to an upright 55, the free end of the upright being provided with a pulley 56 over which the cord 50 passes. The free end of the cord is fastened to one end of the lever 53 by suitable means 57, another pulley 58 being carried by the said base whereby the direction of motion of the cord may be suitably changed. The normal position of the lever 53 is as shown in Fig. 8, which position is maintained by a helical spring 59 extending between the inner ends of the lever and the base; it will be obvious that by pressing down on the free end of the lever the opposite end will be elevated and the cord 50 will be moved, thereby carrying the frame with the rack thereon through a suitable arc.

The normal position of the frame and rack is as shown in Fig. 2 and in order to return the frame to this position after a leaf has been turned, I provide a helical spring 60 carried on the post 27, one end of the spring being connected to the frame and the other end of the spring being connected to the relatively fixed nut 61 carried by the upper end of the post. In order to maintain the aforesaid parts in position on the end of the post, a knurled thumb nut 62, is provided engaging with the threaded end 63 thereof.

From Figs. 2 and 5 it will be noted that the lower end of the rack 45 is in engagement with one of the arms 38, the arm so engaged being extended to the right; any number of arms may be provided depending on the number of leaves to be turned, and in order to provide for the automatic engagement of the lower end of the rack with each succeeding arm, I provide a pivoted lever or trigger 64 having its free end 65 extending angularly upward, this trigger being mounted on the member 66 which is in turn carried by the arm 35; a leaf

spring 67 suitably engaged on the member 66 has the free end thereof bearing against the inner rounded end of the trigger 64 whereby it is held in suitable position.

5 The track 45 is capable of up and down travel in the bifurcated end of the frame 42 and it will be noted from Fig. 5 that one of the laterally extending pins 46 is in engagement with the under side of the trigger 64, 18 and that the pin 46 directly above this trigger lies in a different horizontal plane than the free end of the part 65 of the trigger 64 so that as the frame swings outwardly, this upper pin will engage with the outer end 15 of this member 65, whereby the trigger 64 will be slightly turned on its pivot 68; after a leaf has been turned this upper pin 46, on the return movement of the rack will engage with the under side of the member 65 20 which being held against upward movement by means of the stud 69 will force the upper pin 46 downwardly, and with it the rack 45, thereby moving the lower end of the rack downwardly and into position to engage 25 any succeeding arm 38, the fingers on which are in engagement with a succeeding leaf.

As a means of holding the exposed leaves against turning, due to stiffness of the paper or other causes, I provide the weighted 30 locking arms 70 having enlarged end portions 71, these arms being a downward continuation of the longitudinally extending pivoted member 72 which, (as shown in Figs. 5 and 7) is suitably supported in the 35 rear portion of the nut 61, this member 72 being provided adjacent the nut 61 with a lug 73 having an opening 74 in its outer end, through which the chain or cord 47 passes. The normal position of the weighted arms 40 70 as shown in Fig. 2 and the position of these arms when a leaf is being turned is shown in Fig. 7; the movement of these arms from their vertical position into their substantially horizontal position is accomplished by the chain 47 passing through the 45 opening in the outer end of the lugs 73, the pressure of the chain when it is moved in turning the frame 42 and the rack 45 causing the outer end of the lug 73 to move downwardly, thereby bringing the locking 50 arms 70 upwardly, this upward position being maintained as long as the frame and rack are in moved position during the turning of a leaf so that after a leaf has been 55 turned and the rack returned to normal position by the release of pressure on the chain or cord 47, the arms 70 will also return to normal vertical position in engagement with the succeeding leaves, by reason of the pressure on the outer end of the lug 73 being removed.

The operation of my device has been set forth more or less during the description of the parts thereof so that it may now be recited in general. The leaves of the book or

composition are placed on the supporting frame with the upper corners of the outer leaves secured in position under the clips 18 and 19 and with the needle 31 engaging the 70 central portion of the book or leaves. The arms 38 all lie at the right hand side of the mechanism and the fingers 40, 41, at the outer end of each of the arms 38, are brought into engagement with each succeeding leaf, the weighted locking arms 70 lying 75 against the exposed leaves and the down-turned parts 36 and 37 which are immovable, being in engagement with the inside of the covers. Each succeeding leaf is turned by moving the lever 53 by foot pressure 80 which will result in movement of the cord 50 and the chain 47, thereby bringing the arm 42 and the rack 45 into movement and turning one of the arms 38 to the left hand side of the mechanism, and with it the leaf 85 in engagement with the fingers on that arm; after the leaf has been turned release of pressure on the lever or pedal 53 allows the spring 60 to return the frame and rack to normal position, the said rack being moved 90 downwardly into position to engage the succeeding arm 38 by contact with the trigger 65. By detaching the ring 49 carried by the cord 50 from the chain 47 and by loosening the thumb screw 30, the turning mechanism 95 may be lifted bodily from the post 27.

While I have shown my automatic leaf turner provided with two arms whereby two distinct leaves may be turned, it is obvious that more arms may be provided, thereby 100 making provision for musical compositions which contain more than two sheets, the provision of such arms being included in the spirit and scope of the invention as defined in the following claims. 105

Having thus described my invention, I claim as new, and desire to secure by Letters Patent:—

1. In a device of the class described, a frame, the upper portion of the frame and 110 at opposite corners being provided with clips, a post carried by the frame and at a substantially vertical central position thereon, down-turned members carried by the post, a plurality of arms rotatably supported on the upper end portion of the post, 115 the outer end of each arm being provided with movable fingers for engaging the opposite sides of successive leaves in a book, the said arms lying one above the other 120 when the said leaves are so engaged, preparatory to turning them, a frame rotatably supported on the upper end of the said post, a vertically movable rack carried at the outer end of the said frame and provided 125 with a number of transversely-extending pins, the lower end of the said rack being normally in engagement with one of the said arms, a trigger pivotally carried on one of the said down-turned members, the 130

trigger extending forwardly and angularly of the said member, the outer end of the trigger being movable downwardly, the trigger being held against upward movement, a spring secured to the said post and the said rotatable frame, whereby the frame, with the said rack thereon, is held, normally adjacent the said trigger, a cord or equivalent means in engagement with the said rotatable frame, whereby it may be turned, thereby moving the rack and one of the arms with the leaf engaged thereby, release of the cord permitting the said spring to return the frame and rack to normal position with the said pins successively engaging the trigger, whereby the rack is moved and the lower end thereof brought into successive engagement with the rotatable arms.

2. In a device of the class described, a frame, means on the frame for holding a book in position, a post carried by the frame, a plurality of arms rotatably supported on the post, each arm being provided with means for engaging the successive leaves of a book, the said arms lying one above the other, a frame rotatably supported on the upper end of the post and adjacent the upper one of the said arms, a vertically movable rack carried at the outer end of the said frame and provided with a number of transversely-extending pins, the lower end of the rack being normally in engagement with one of the said rotatable arms, a trigger pivotally carried adjacent the upper end of the said post, the vertical plane in which the trigger lies being closely adjacent the plane of the vertically movable rack, means for preventing movement of the trigger in one direction, a spring in engagement with the said post and the said rotatable frame, whereby the frame with the rack thereon is held normally adjacent the trigger, a cord or equivalent means in engagement with the frame, for moving the rack and one of the arms with the leaf engaged thereby, release of the cord permitting the spring to return the frame and the rack to normal position, each pin on the rack successively engaging the aforesaid trigger, whereby the rack is moved and the lower end thereof is brought into successive engagement with the arms.

3. In a device of the class described, a frame, means on the frame for holding a book in position, a post carried by the frame, a plurality of arms pivotally mounted one above the other at the end of the post, each arm being provided with means for engaging the successive leaves of a book, a frame rotatably supported on the upper end of the post, a vertically-movable rack carried at the outer end of the said frame and having a number of transversely-extending pins thereon, the lower end of the rack,

when in normal position, engaging one of the said arms, a trigger carried by the said device and pivotally supported adjacent the said post and the rack, the outer end of the trigger being freely movable downward, and means for holding it against upward movement, a spring for holding the frame with the said rack thereon normally adjacent the said trigger, a cord or equivalent means in engagement with the frame for turning the rack and with it one of the arms and the leaf engaged thereby, release of the cord permitting the said spring to return the frame and rack to normal position and successively engaging the said trigger, whereby the rack is moved and the lower end thereof is brought into operative position with each succeeding arm, to turn the same with the leaf engaged thereby.

4. In a device of the class described, a frame, a clamp on the frame for securing it to a suitable support, the upper portion of the frame at opposite corners being provided with clips for engaging a book, a post carried by the frame at a substantially central portion thereof; a downwardly-extending pivoted needle carried by the post for engagement with the central portion of the book, a plurality of arms rotatably supported adjacent the upper end of the post, the outer end of each arm being provided with fingers for engaging the successive leaves of the book on opposite sides thereof, the said arms lying one above the other, a frame rotatably supported on the post and above the said arms, a vertically-movable rack carried by the said frame and provided with a number of transversely-extending pins, the lower end of the rack being normally in engagement with one of the said arms, a trigger pivotally supported adjacent the top of the post, whereby it may be moved downwardly, and means for holding it against upward movement, a spring secured to the said post and the said rotatable frame, whereby the frame with the rack thereon is held normally adjacent the said trigger, a cord or equivalent means in engagement with the frame for turning it and one of the arms with the leaf engaged thereby, release of the cord permitting the said spring to return the frame and rack to normal position, each pin on the rack successively engaging the said trigger, whereby the rack is moved downwardly and the lower end thereof is brought into successive engagement with the rotatable arms and in position for turning the leaves successively.

5. In a device of the class described, a frame for holding a book, a vertically-extending post carried by the frame, a plurality of arms rotatably supported on the post, each of the arms being provided with means for engaging the successive leaves of a book, rotatable frame carried by the post

and above the said arms, a vertically movable rack carried in the frame, a trigger held against movement in one direction pivotally supported adjacent the said frame, 5 downwardly-extending weighted arms movably supported adjacent the top of the post, a lug carried by the arms, means for supporting the said trigger and the said arms, the lower end of the said rack being normally in engagement with one of the said 10 arms, a spring on the said post, one end thereof being in engagement with the frame, and means engaging the frame and also the lug on the said weighted arms, for raising 15 the arms and turning the frame, whereby the rack may move one of the arms, thereby turning a leaf, there being means on the said rack engaging the said trigger on its return movement in order to move the rack 20 downwardly and into engagement with another one of the said arms.

6. In a device of the class described, a frame for holding a book, means on the frame for securing it to a suitable support, 25 means whereby the frame may be adjusted to hold books of different sizes, a vertically-extending post carried by the frame, a plurality of arms rotatably mounted on the post, each arm being provided with means 30 for engaging the successive leaves of the book, a rotatable frame carried on the post and above the said arms, a vertically-movable rack carried in the frame, transversely-extending pins on the rack, a trigger 35 pivotally supported adjacent the said frame and freely movable in one direction, downwardly-extending arms movably supported adjacent the top of the post, a lug carried by the arms, an opening in the lug, means for 40 supporting the said trigger and the said arms, the lower end of the rack being normally in engagement with one of the said arms, a spring on the post, one end thereof being secured to the post and the other end 45 to the said frame, and means engaging the frame and the opening in the said lug for raising the said arms and turning the frame,

whereby one of the arms and with it a leaf may be turned, the said frame on its return movement permitting the weighted arms to 50 return to normal position, and one of the pins on the said rack to engage the said trigger, whereby the rack is moved downwardly and into engagement with the next one of the said arms and into position for 55 moving the same.

7. In an automatic leaf turner, a rotatable frame, means for mounting it, a vertically-movable rack having extending pins carried by the frame, a trigger pivotally supported 60 in position adjacent the rack, a spring in engagement with the frame for maintaining it in position, and means in engagement with the frame for turning it against the pressure of the spring, the said rack being moved on 65 the return of each frame by the engagement of the trigger with each successive pin.

8. In an automatic leaf turner, a rotatable frame, means for mounting it, a vertically-movable rack having a plurality of transversely-extending pins thereon, a trigger 70 pivotally supported adjacent the rack, the trigger being freely movable in one direction, means for preventing movement thereof in an opposite direction, a spring in engagement 75 with the frame and with the supporting means therefor, the lower end of the said rack being adapted to engage any one of a plurality of arms in engagement with succeeding leaves, and means for turning the 80 frame against the pressure of the spring and with it one of the arms, the return movement of the frame bringing one of the pins on the rack into engagement with the said trigger whereby the rack is moved and the lower 85 end thereof brought into engagement with another one of the arms.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES ARCHIBALD ANDREW.

Witnesses:

E. HUISTIS,

W. G. BECKTELL.